



# Laboratory Products



### **A warm welcome to MRC.**

We are delighted to present our catalog for 2014/5.

It is a record of our broad range of technologies and products, which has once again been expanded.

Ever since MRC was founded in 1989 we developed and produce innovative laboratory equipment.

MRC full-spectrum of laboratory equipment for: sample preparation, liquid handling, heating/cooling, distilling, vacuum, weighing, storage

and Analytical line are used anywhere where top quality instruments need to support users in solving laboratory tasks.

More than 1,400,000 instruments installed around the world demonstrate the trust MRC enjoy with users in science, research and industry.

We have earned the place as one of the worlds leading firms in the field of laboratory equipment through dedication to quality and rapid competent support.

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**AKA-11, Automatic Kjeldahl Analyzer**

AKA-11

**Characteristics:**

- Automatic completion of distillation, titration, calculation, printing, waste discharge and cleaning.
- External titration cup design gives operator real-time control of the whole test process.
- Large LCD touch screen gives visual operation & abundant information, enabling user to have a good command of it.

**Scope of application** AKA-11 Auto Analyzer is widely used in food processing, feed production, tobacco, livestock, soil fertility, environmental monitoring, medicine, agriculture, scientific research, teaching, quality control & other fields for the test of nitrogen or protein content, can also be used for the test of ammonium, volatile fatty acid / alkali, & so on.

**DIST-984, Auto Distiller**

DIST-984 Auto Distiller is designed to determine nitrogen content of samples in the globally accepted Kjeldahl nitrogen determination method. Fully intelligent software is able to complete sample distillation within minutes. The distillation and condensation automatic cleaning system further enhances measurement precision. It is widely used in food processing, feed production, tobacco, livestock, soil fertility, environmental monitoring, medicine, agriculture, scientific research, teaching, quality control.



DIST-984

AKA-11 Auto Kjeldahl analyzer is an automatic device integrating distillation and titration functions designed based on classic Kjeldahl nitrogen determination method.

It's equipped with the latest core control system, powerful automatic degree and high-quality components, can easily achieve automatic waste discharge and cleaning of boiling tubes and titration cups, control steam supply and have real-time detection of condensation temperature.

High-accuracy charging pump and titration system ensure test results accuracy, and multiple fluid-level detection gives smooth test process.

**Titration precision as high as 1.0 $\mu$ L/step** AKA-11 Auto Kjeldahl analyzer has exclusive design i.e. linear motor micro-control titration system which ensures accurate results; the external use is easy for the observation of the whole titration process; the built-in high-sensitivity color sensing unit ensures accurate final point determination; extremely high-precision plunger titration unit achieves unprecedented precision as high as 1.0 $\mu$ L/step.

**Brand new touch interaction system** The powerful calculation function based on ARM microprocessor unit can be operated directly through the touch screen; powerful detection function has all test steps under real-time monitoring with status displayed in figures; solution barrel level detection function and high-grade pump effectively ensure correct solution supply; samples can be detected and classified by the system, and traditional test methods & parameters are built in & can be freely used in the test process.

**Correct steam control** New material PTC constant-temperature heating modules are used in the heating unit of the steam generation system, and the use of metallic heater speeds up the fluid boiling, ensuring the generation of a great deal of steam in a short period; digital electronic temperature measurement and mechanical temperature measurement provides the heating unit with double protections; customized steam pressure regulating valve guarantees the steam generation system safety and ensures uniform steam output; and steam flow is also adjustable with software system.

Model	AKA-11
<b>Sample capacity</b>	Solid $\leq$ 5.00g/sample, liquid $\leq$ 20mL/sample
<b>Measuring range</b>	0.1mg N - 200mg N
<b>Analysis time</b>	5 - 10 min/sample
<b>Recovery</b>	$\geq$ 99.5%
<b>Burette volume</b>	1.0 $\mu$ L/step
<b>Reproducibility</b>	Average value relative error 0.5%
<b>Storage capacity</b>	1000 pieces
<b>Interface</b>	USB or RS485
<b>Power supply / Power</b>	220V 50Hz / 2KW
<b>Water consumption in the distillation process</b>	1.5L/min
<b>Cooling water temperature</b>	<20 $^{\circ}$ C
<b>Ambient temperature</b>	10 $^{\circ}$ C - 28 $^{\circ}$ C

**Characteristics:** Display: 5.1" LCD screen • Manual/automatic mode free changeover • Automatic alkali liquid quantification and filling • Automatic boric solution quantification and filling • Automatic or manual filling mode is optional according to test need • Distillation time can be set freely, and automatic alarming upon completion • Automatic cleaning of control system and distiller, ensuring high measurement accuracy • Perfect safety protection system gives distiller and tubes measurement and protection against over-temperature and over-pressure • Intelligent cooling water control system achieves cooling water control and test.

Model	DIST-984
<b>Measuring range</b>	0.1-200mgN (mg N)
<b>Nitrogen recovery</b>	$\geq$ 99.5%
<b>Repeat accuracy</b>	$\pm$ 0.5%(CV)
<b>Sample weight</b>	Solid<6g, liquid<16ml
<b>Distillation speed</b>	< 5min/sample
<b>Distillation period</b>	Can be set freely (within 1 hour)
<b>Cooling water consumption</b>	1.5 L/min
<b>Power supply</b>	220V 50Hz
<b>Power / Max. power</b>	2KW / 1300W
<b>Volume</b>	400mm $\times$ 361mm $\times$ 746mm



GD-52

**GD-52, Graphite Digester**

Model	GD-52
Temperature range	Room temperature ~480°C
Heating method	Infrared heating & high-purity graphite conduction
Temperature accuracy	±0.5°C (450°C)
Digestion capacity	20 samples can be processed at the same time
Heat insulation material	High-density aluminum silicate
Power supply	220V 50Hz
Power	3.6KW
Size	534mm×540mm×470mm

GD-52 Graphite Digester includes globally advanced high-temperature infrared tube radiation heating technology and microprocessor control platform, boasts accurate temperature control and quick temperature rise, has linear and curve two temperature rise modes, offers 20 digestion programs for the control of temperature rise curves.

The waste gas recycle system is able to absorb acidic smog and other harmful gases. It has graceful appearance, large LCD screen, diversified user-oriented automatic designs, ensures safe & reliable use, simple operation, ideal for high-temperature digestion.

It's mainly used for the digestion of samples of soil, feeds, plants, seeds and ores prior to chemical analysis in such fields as food, medicine, agriculture, forestry, environmental protection, chemical engineering, ecological industry, as well as universities & scientific research institutes.

**Characteristics:**

- Heating method: Graphite module is infrared heated, offering uniform heating, preventing heat loss to the maximum extent.
- Smaller average temperature difference inside furnace, consistent sample digestion effect and high heat transfer efficiency.
- Control method: Intelligent microprocessor offers 20 digestion programs, can set temperature and time gradient.
- Temperature control method: Program control, curve & linear temp. rises.
- Displaying system: Large LCD touch screen.
- Multiple protections against over-voltage, over-current, overheating, and so on.
- Historic information query function is available.
- Anti-corrosive technique is used in the whole body.
- Comfortable and free lifting and over-temperature alarming.
- Power is adjustable according to the setting method.



GD-22

**GD-22, Graphite Digester**

Model	GD-22
Temperature range	Room temperature ~450°C
Heating method	Infrared heating & high-purity graphite conduction
Temperature accuracy	±1°C
Digestion tube capacity	280ml
Processing capacity	20pcs
Heat insulation	High-density aluminum silicate
Power supply	220V 50Hz
Power	3.6KW
Size	534mm×453mm×218mm

GD-22 Graphite Digester includes globally advanced technology, features quick digestion, high efficiency and easy for use, etc., is widely used in such fields as food, medicine, agriculture, forestry, environmental protection, chemical engineering, biochemistry, as well as universities, research departments and so on, for sample digestion prior to the chemical analysis of soil, feed, plants, seeds, minerals etc., suitable for matching DIST-984 analyzer.

**Optional accessories:**

- WGCH-02 waste gas collection hood.
- Connect the digester to the waste discharger for the removal of acidic gases.

**WGCH-02 characteristics:**

- Full stainless steel casing.
- PTFE and FPM anti-corrosive materials are used for the connection parts, greatly increase its service life.
- U.S. Dupont FPM seal rings are used for sealing joints, offering high flexibility and corrosion resistance, excellent air-tightness, can minimize exhaust gas leakage.



WGCH-02

**Characteristics:**

- Continuously adjustable furnace temp., constant temperature control and simple operation.
- Smaller average temperature difference inside furnace, consistent sample digestion effect and high heat transfer efficiency.
- Its chamber is made of stainless steel, enjoying excellent corrosion resistance.
- The use of anti-corrosive parts enhances its service life.
- It enjoys multiple protections against over-voltage, over current, overheating, and so on.
- The sample is given uniform heating, to prevent heat loss to the maximum extent.
- Superior heater ensures temperature uniformity among the digestion holes.
- Double-casing design offer double insulations i.e. air and aluminum silicate thermal insulating layers.



FA-46

**FA-46, Fat Analyzer**

Model	FA-46
Measuring range	0-100%
Capacity per batch	6pcs./batch
Sample weight	0.5-15g (generally 2-5g depending on sample)
Solvent cup volume	80ml
Temperature range	Room temp.+5°C - 280°C
Temperature accuracy	±1°C
Solvent recovery	≥80%
Reproducibility	±1%
Power supply	220V 50Hz
Power	1000W

FA-46 Fat Analyzer is based on the Soxhlet extraction principle and integrates such functions as soaking, extraction, leaching, heating, condensation and solvent recovery. It features sealed metal bath heating with automatic temperature control, ensuring uniform heating and safe operation; six samples can be tested at the same time, and optimal temperature can be selected according to the difference between reagent boiling point & ambient temperature so as to achieve quick analysis; reagents can also be recycled to reduce test cost; and soaking, extraction and solvent recovery can be done in one step. Therefore, this device is characterized by reasonable design, stable performance, good reproducibility, high accuracy, easy operation, saving time and effort, and so on.

**Scope of application:**

FA-46 Fat Analyzer can quickly separate one substance from solid or semi-solid mixtures, can determine the soluble organic compounds contained in foods, feeds, medicines, soil, sludge, polymers, fiber products, petrochemical products, detergents, rubber, plastics and other materials.

**For example:**

1. Quickly and safely determines the fat in foods, feeds, grains and seeds.
2. Extracts the semi-volatile organic compounds, pesticides, herbicides, etc. from soil.
3. Extracts oils from waste water or sludge.
4. Extracts plasticizer from plastic, rosin from paper or paperboard, grease from leather, etc.
5. Digests, as pretreatment, the solid samples for the gas or liquid chromatography process.

**Characteristics:**

- Integral metal heating, wide scope and high precision of temperature control.
- Electric circuit is isolated from the extraction space, ensuring device security.
- Timer & timing functions are available.
- Over-temperature alarming and timer reminding functions are available.
- Triple alarms i.e. sound, light, LCD screen word prompts are available.
- Abundant interface contents give simultaneous display of given temp., actual temperature, given time and heating time.
- The lifting connection of linear bearing conduction technique gives smooth & comfortable lifting operation.
- Intelligent man-machine dialogue control system.
- Exclusive air insulation technique leaves the case in room temperature, has thermal insulation and temp. maintenance two functions.
- 5.1" LCD screen and microcomputer control system are adopted.

**FA-5, Fat Automatic Analyzer**

FA-5

Model	FA-5
Measuring range	0.1-100%
Capacity per batch	6pcs./batch
Sample weight	0.5-15g
Solvent cup volume	150ml
Temperature range	Room temp.+5°C - 300°C
Shortened extraction time	20-80%
Solvent recovery	≥85%
Reproducibility	Relative error 1%
Power supply	220V 50Hz
Power	2400W
Size	650mm x 348mm x 740mm

FA-5 Fat Analyzer, designed based on the Soxhlet extraction principle, is an automatic crude fat analyzer in which weight method is used to determine the fat content. Such five extraction methods as Soxhlet standard method (national standard), Soxhlet thermal extraction, thermal extraction, continuous flow and Soxhlet CH standard thermal extraction; extraction, leaching, solvent recovery and pre-drying four functions can be automatically achieved; one-piece metal bath heating is used, giving perfect heating effect; color touch screen and its concise interface design bring people new feeling; external operation panel and printing system are adopted; built-in ether leak detection device effectively prevents air pollution and well protects test safety.

**FA-5, Fat Automatic Analyzer**

**Characteristics:**

- Colorful and pleasing touch screen with concise interface design and external small-size operation panel provide easy operation & save space.
- Five exclusive extraction methods are at your option.
- Test process can be suspended or resumed at any time, offering flexible control.
- One-piece metal bath heating gives quick, uniform, stable & safe temperature rise.
- Wide scope of temperature control, applicable for the organic solvents with different boiling points.
- Independent timer and timing circulation system give accurate control of the test.
- External printing system is at your free choice and saves cost.
- Ether leak alarming ensures test operator safety at all times.
- Real-time monitoring of device abnormalities.
- Automatic cooling water control saves water & protects environment.
- Efficient solvent recovery system.

**Five extraction methods and four functions**

FA-5 fat analyzer boasts such five extraction methods as Soxhlet standard method (national standard), Soxhlet thermal extraction, thermal extraction, continuous flow and Soxhlet CH standard thermal extraction for user option, & such four automatic functions as extraction, leaching, solvent recovery and pre-drying. It's designed according to our investigation over 3000 users, well catering for user demands.

**Powerful temperature control capacity**

One-piece metal bath heating method is used, giving quick and uniform temperature rise; FA-5 dedicated timer and time control system enable user to easily obtain accurate test results.

**Safe and eco-friendly**

The built-in ether leak detection device, being subject to 500 rounds of tests, enjoys reliable safety performance; solvent recovery system and automatic cooling water control system show user and environment technology considerations, without worrying about any environment pollution during the test process.

**Scope of application**

FA-5 fat analyzer is widely used in agriculture, food, environment & industries and other fields, ideal for fat test in the food, fuel, feed and other industries, can also be used for the extraction or determination of soluble organic compounds in medicines, soil, sludge, detergents and so on.



**FIA-6, Fiber Analyzer**

Model	FIA-6
Measuring range	0.1-100%
Sample weight	0.5-3g (generally 1g)
Measuring capacity	6 samples/batch
Reproducibility	>1% in case of 1-30% fiber content
Accuracy	±0.1%
Power supply	220V 50Hz
Power	3.2KW
Overall Size	482mm x 560mm x 465mm
Weight	45kg

**Characteristics:**

- Advanced infrared heating manner gives high heating efficiency and excellent control property.
- U.S. Imported filter pump boasts high acid/alkali resistance, good stability and long service life.
- High-precision acid/alkali filter device maintains samples in good condition.
- Three pre-heating routes of acid/alkali distilled water can be controlled separately, and digestion heating is under separate control, easy for setting adjustment.
- Reagent pre-heating, adding, sample filtration back flushing and other functions are all under electric and automatic control.
- Six samples can be dealt with at the same time, and sample digestion time can be set freely.
- Stable, rapid and safe automatic filtration back-flushing effectively prevents sample blockage.
- 5.7" high-definition color LCD screen displays current test status; intelligent HMI is available.

**Professional core parts:** FIA-6 Fiber Analyzer uses u.s. imported high acid/alkali resistant long-life filter pump & high-precision acid/alkali filter device, achieves the breakthrough of internal essential parts: high-efficient infrared tube heating greatly enhances temperature control & heat efficiency.

**Superior test assistant:** FIA-6 Fiber Analyzer can deal with 6 samples at the same time, & the sample digestion time can be set freely: 3 pre-heating routes of acid/alkali distilled water can be controlled separately, giving extremely easy operation.

**Intelligent software system:** 5.7" high-definition color LCD screen display current working status, temp., time & other information: high-efficient infrared heating system includes 2 work modes which can be selected as needed: intelligent status locking function can prevent any accidents due to error operation: the limit of longest fluid adding time prevents solution overflowing arising from error operation.

FIA-6 Fiber Analyzer is an analysis Instrument used to test the crude fiber content of samples through acidic or alkaline hydrolysis, flushing and filter process. FIA-6 functions include automatic solution adding, automatic pre-heating and so on. Infrared tube heating is used, and high-precision soak extraction and filter ensure test precision; high-definition color LCD screen displays temperature and time. FIA-6 Fiber Analyzer is applicable for the test of crude fiber contents of plants, feed foods and other agricultural products, and testing detergent fibers, cellulose, semi-cellulose, lignin and other relevant parameters.



**MIA-SLP**

### MIA-SLP/MIA-SLP-A, Economy Milk Analyzers

**MIA-SLP 30sec:** Standard 30sec.

**MIA-SLP 60sec:** Standard 60sec.

**MIA-SLP-A 30sec:** Automatic 30sec.

**MIA-SLP-A 60sec:** Automatic 60sec.

#### MIA-SLP/ MIA-SLP-A Options & Accessories:

- MIA-EP: External Printer.
- MIA-HF: Measuring high fat samples (cream) up to 45% (High Density).
- MIA-DCP: Milk Data Collection Program.
- MIA-PH: pH measurement - function.
- MIA-CON: Conductivity measurement function.
- MIA-P: pH probe.
- MIA-EK: External keypad.
- MIA-USB: USB.
- MIA-RTC: Real time clock.

#### Consumables:

- MIA-B7: Buffer solution Ph 50 ml (pH7.00±0.01/20°C).
- MIA-B4: Buffer solution pH 50 ml (pH4.00±0.01/20°C).
- MIA-B5ms: Buffer solution conductivity 50 ml (5.02 (±5%) mS/cm (18±0.1°C)).
- MIA-ALC: Alkaline cleaning powder.
- MIA-ACC: Acidic cleaning powder.
- MIA-PAPER: Printer paper roll.

Model	MIA-SLP/MIA-SLP-A		
Measuring time	Measuring parameters	Standard complete	Additional options
60 Sec	FAT – 0.01% – 25% SNF – 3% – 15% Density – 1015 –1040kg/m <sup>3</sup> Proteins – 2% – 7% Lactose – 0.01% – 6% Water content – 0% – 70% Temp. of milk – 1°C– 40°C Freezing point – -0.400–0.700°C	1. Hoses-spare pipes-1/2pcs 2. Sample holders-plastic mugs-2 pcs 3. Switching adapter: input: 100-240 V~1.6A max. 50-60Hz 4. output: +12V 4.17A min. 5. Output power: 50-65W 6. Operation Manual 7. Standard Calibrations: Cow-Sheep-UHT 8. Cardboard Box 9. CD – Service pack	Ph option 0-14
30 Sec	Salts – 0.4 – 1.5% PH – 0 – 14 ±0,05% (option) Conductivity – 3 – 14 [mS/cm]±0,05% (option) Total solids – 0 –50% ±0,17(option)		Conductivity 3-14ms/cm
			Total Solids 0-50%



**MIA-S**

### MIA-S/MIA-SA, Standard Milk Analyzers

Model	MIA-S/MIA-SA		
Measuring time	Measuring parameters	Standard complete	Additional options
90 Sec	FAT – 0.01% – 25% SNF – 3% – 15% Density – 1015 –1040kg/m <sup>3</sup> Proteins – 2% – 7% Lactose – 0.01% – 6%	1. Hoses-spare pipes-2pcs 2. Sample holders-plastic mugs-2 pcs 3. Switching adapter: input: 100-240 V~1.6A max. 50-60Hz 4. output: +12V 4.17A min. 5. Output power: 50-65W 6. Operation Manual 7. Standard Calibrations: Cow-Sheep-UHT 8. Cardboard Box 9. CD – Service pack	Ph option 0-14
50 Sec for SA 60 Sec for S	Water content – 0% – 70% Temp. of milk – 1°C– 40°C Freezing point – -0.400 –0.700°C Salts – 0.4 – 1.5% PH – 0 – 14 ±0,05% (option) Conductivity – 3 – 14 [mS/cm]±0,05% (option)		Conductivity 3-14ms/cm
30 Sec for S	Total solids – 0 –25% ±0,17(option)		Total Solids 0-25%

**MIA-S:** Standard. **MIA-SA:** Standard Automatic.



embedded printer • embedded keypad  
 • integrated weight scales • additional serial printer • matrix printer (option) • external keypad (option) • peristaltic pump – automatic cleaning • knee-joint (mobile) input pipe • adjustable to the input pipe pH probe holder • possibility of using different sample holders • integrated pH & conductivity measuring • self calibration without computer.



MIA-CC

### MIA-CC, Milk Collecting Center

Model	MIA-CC		
Measuring time	Measuring parameters	Standard complete	Additional options
50 sec	FAT – 0.01% – 25%(option 45 %) SNF – 3% – 40% Density – 1000 –1160kg/m <sup>3</sup> (1160 kg/m <sup>3</sup> option) Proteins – 2% – 15% Lactose – 0.01% – 20% Water content – 0% – 70% Temp. of milk – 5°C– 40°C Freezing point – -0.400 -0.700°C	1. Hoses-spare pipes-2pcs 2. Sample holders-plastic mugs-2 pcs 3. Switching adapter: input: 100-240 V~1.6A max. 50-60Hz 4. output: +12V 4.17A min. 5. Output power: 50-65W 6. Operation Manual 7. Standard Calibrations: Cow-Sheep-UHT 8. Cardboard Box 9. CD – Service pack	Ph option 0-14 Conductivity 2-14ms/cm Total Solids 0-50% High Fat 45% High Density
30 sec	PH – 0 – 14 ±0,05% (option) Conductivity – 2 – 14 [mS/cm] ±0,05% (option) Total solids – 0 –50% ±0,17(option) Kg From 0 – 150 kg ±0,10 kg (option)		Integrated scales Accumulator with charger Real time clock Remote display

#### Environmental Conditions:

Ambient air temp. – 10°C – 40°C (option 43°C) • Milk temp. – 1°C – 40°C • Relative humidity – 30% – 80%

**Electrical Parameters:** AC Power Supply voltage – 220V/110VDC •

Power Supply voltage – 12V to 14,2V • Power Consumption – 30W max.

**Mechanical Parameters:** DIM.: W290xD300xH330mm • Weight < 5 kg.



MIA-LA

### MIA-LA, Laboratory Automat Milk Analyzer

peristaltic pump – automatic cleaning • knee-joint (mobile) input pipe • adjustable to the input pipe pH probe holder • possibility of using different sample holders • possibility of connecting pH probe • integrated pH and conductivity measuring • self calibration without computer. Key features: User-friendly: simple in operation, maintenance, calibration and installation • Portable and compact design • Very small quantity of milk required • Low power consumption • No use of hazardous chemicals • One year full warranty • Measuring accuracy adjustment can be done by the user RS 232 Interface • ESC POS Printer Support • 2 samples self-calibration.

Model	MIA-LA		
Measuring time	Measuring parameters	Standard complete	Additional options
50 sec	FAT – 0.01% – 25%(option 45%) SNF – 3% – 40% Density – 1000 –1160kg/m <sup>3</sup> (1160 kg/m <sup>3</sup> option) Proteins – 2% – 15% Lactose – 0.01% – 20% Water content – 0% – 70% Temp. of milk – 5°C– 40°C Freezing point – -0.400 –0.700°C	1. Hoses-spare pipes-2pcs 2. Sample holders-plastic mugs-2 pcs 3. Switching adapter: input: 100-240 V~1.6A max. 50-60Hz 4. output: +12V 4.17A min. 5. Output power: 50-65W 6. Operation Manual 7. Standard Calibrations: Cow-Sheep-UHT 8. Cardboard Box 9. CD – Service pack 10. Sample visualization on LED display.	Ph option 0-14 Conductivity 2-14ms/cm High Fat 45% High Density Total Solids 0-50%
30 sec	Salts – 0.4– 4% PH – 0 – 14 ±0,05% (option) Conductivity – 2 – 14 [mS/cm]±0,05%(option) Total solids – 0 –50% ±0,17(option)		Integrated scales Accumulator with charger Real time clock Remote display

#### Environmental Conditions:

Ambient air temp. – 10°C – 40°C (option 43°C) • Milk temperature – 1°C – 40°C • Relative humidity – 30% – 80%

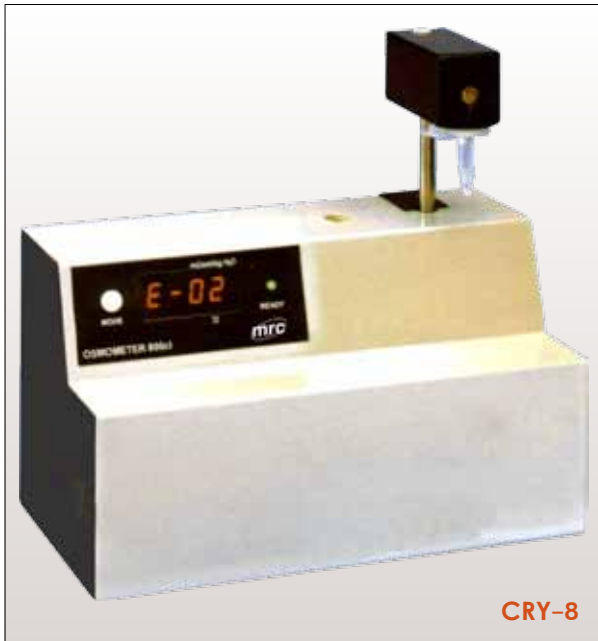
**Electrical Parameters:** AC Power Supply voltage – 220V/110VDC • Power Supply voltage – 12V to 14,2V • Power Consumption – 30W max.

**Mechanical Parameters:** DIM.: W250x-D290xH300mm • Weight < 4 kg.

#### This option is available for 60 sec measurement speed

Thermostatic test device for Eclipse 50 and Twin sensor test kits		Thermostatic test device (with timer)	<b>159-1-000010</b> Eclipse 50 (96 tests in a box) – test for detection of inhibitor substances in milk	
			<b>159-1-000011</b> Antibiotics detection test kits (β-lactam+Tetracycline detection) Twin sensor BT (24 tests in a box) (without a Pipette)	

## CRY-8, Cryoscope



### Features and Benefits:

#### ● Freezing Point Analyzer for Milk

The CRY-8 is a modern digital analyzer for the accurate determination of the freezing point temperature in samples of raw milk or milk products (skimmed, pasteurized or UHT-milk).

The most objective indicator for the degree of falsification of milk by additional water is the raising of the freezing point temperature from  $> -0.512$  °C. The CRY-8 complies fully with the international standard ISO 5764/2002(E), IDF 108/2002(E) "Milk" - Determination of Freezing Point - Thermistor Cryoscope Method (Reference Method) and Annex C without the necessity to correct the results to the reference method.

The analyzer measures temperatures in the range from below  $-0.512$ °C (pure milk) to  $-0.527$ °C in increments of  $0.001$ °C.

#### ● Peltier Effect

The measuring principle is the freezing point detection of super cooled liquids based on the Peltier Effect. On the cold side of an Peltier element the milk samples are cooled down below the freezing point in the range  $0$  to  $-7$ °C.

#### ● 1-Point Calibration

One-point calibration –the instrument requires for calibration only one distillation water sample. Measurement corrections are done automatically & entered into

the microprocessor memory. It is an outstanding advantage of the CRY-8, that calibration is performed in ONE POINT ONLY. In comparison with this, competitive analyzers do need 2 or 3 different calibration points.

Once the CRY-8 is calibrated, the CALIBRATION REMAINS STABLE the whole day AS LONG AS THE INSTRUMENT STAYS SWITCHED ON.

#### ● Aqua Dest - Calibration

The CRY-8 does not need expensive calibration solutions except distilled water for the zero point. These features, 1-POINT CALIBRATION and AQUA DEST-CALIBRATION ARE UNIQUE in the market and they CONTRIBUTE TO SAVING LABOR TIME AND COSTS FOR PURCHASE and STORAGE OF EXPENSIVE CALIBRATION STANDARDS.

#### ● 100µl Sample Volume & disposable measuring vessel

Precise measuring results from only 100µl sample make the CRY-8 disposable measuring vessels not require washing and sterilization.

#### ● Easy Operation

After the samples in 1.5ml tubes are inserted into the measuring position the instrument PERFORMS AUTOMATICALLY THE MEASURING PROCEDURE. FUNCTION CONTROL and ERROR IDENTIFICATION are also automatically done by the instrument. High accuracy ( $\pm 0.002$  °C) and repeatability ( $\pm 0.002$  °C) of results. Short measuring time ca 1.5 min. Digitally readout of temperature °C and %H<sub>2</sub>O with printout. The printer can be adapted via RS 232 data port.

#### ● Simple Installation

The CRY-8 is air cooled and does not need any connection to cooling water.

#### ● Robust Housing

The sheet metal housing with epoxy lacquer paint ensures UTMOST MECHANICAL and CHEMICAL RESISTANCE to the laboratory environment.

#### ● Small Dimensions

Small instrument weight and dimensions, big resistance to vibrations and hard working conditions (humidity max 85%, ambient temp. 36°C) make the CRY-8 from well applicable in stationary and field conditions.

## HA-17600, 2 Counting Channels Hematology Analyzer With Touch Screen



HA-17600

Model	HA-17600
<b>Parameters</b>	WBC, LYM#, MID#, GRA#, LYM%, MID%, GRA%, RBC, HGB, MCHC, MCH, MCV, RDW-CV, RDW-SD, HCT, PLT, MPV, PDW, PCT, P-LCR and Histograms for WBC, RBC and PLT
<b>Principles</b>	Electrical resistance for counting WBC, RBC and PLT
<b>Performance</b>	Parameter Precision (CV %): WBC (109/L) 2.0(7.0-15.0) RBC (1012/L) 1.5(3.50-6.00), HGB (g/L) 1.5(110 - 180) MCV (fL) 0.4(80.0 - 110.0), PLT (109/L) 4(100 - 500)
<b>Sample Volume</b>	Prediluted: 20µL, Whole Blood: 9.8µL
<b>Aperture Diameter</b>	WBC 80µm; RBC 50µm
<b>Throughput</b>	60 samples per hour
<b>Display</b>	10.4" TFT Color LCD with touch screen, Resolution: 800x600
<b>Alarms</b>	Error messages
<b>Carryover</b>	WBC/RBC/HGB<0.5%, PLT<1.0%
<b>Input/Output</b>	RS-232, USB, LAN, keyboard and mouse interface
<b>Printout</b>	Thermal printer, 55mm width paper, various printout formats, external printer optional
<b>Operating Environment</b>	Temperature: 15°C~35°C; Humidity: 10%~90%
<b>Power Requirement</b>	AC 110-220V, 50/60Hz
<b>Dimension(mm)</b>	L436xW363xH367
<b>Weight</b>	18Kg

### Features:

- 20 parameters+3 histograms.
- 2 counting channels, 3-part differentiation of WBC.
- 2 Counting mode: whole blood and pre diluted.
- 60 samples per hour
- Up to 50000 sample results (including histograms) can be stored
- 10.4" TFT color LCD with touch screen
- Built-in thermal printer, optional external printer
- External AC adapter avoids electronic noises, enhancing accuracy
- Multi-language software available on request.

## SACA-11904C, High Quality Chemistry Analyzer With 7 Filters, Color LCD



SACA-11904C

Model	SACA-11904C
<b>Principle</b>	Absorbance
<b>Photometric range</b>	-0.500~3.000Abs
<b>Resolution</b>	0.001Abs (displayed), 0.0001Abs (calculated)
<b>Light Source</b>	Halogen lamp
<b>Wavelengths</b>	340, 405, 500, 546, 578, 620, 670nm, 1 more filter optional
<b>Wavelength Accuracy</b>	±1nm
<b>Band Width</b>	8nm
<b>Aspirate Volume</b>	100~300µL
<b>Carryover</b>	<0.1%
<b>Memory</b>	160 test protocols, minimum 500 test result
<b>Interface</b>	RS-232, USB, SD card interface
<b>Flow Cell</b>	25µL Metal-quartz flow cell
<b>Cuvette Mode</b>	12.5mm x 12.5mm cuvette optional
<b>Temperature Control</b>	25°C, 30°C, 37°C, ±0.1°C
<b>Display</b>	7" color LCD
<b>Input</b>	USB mouse and external keyboard
<b>Output</b>	Build-in printer or external printer (optional)
<b>Net Weight</b>	8KG
<b>Dimensions(mm)</b>	L460xW330xH140
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz

### Features:

- Easy Windows operation system with mouse, large color LCD display.
- Reagent open system supports flow cell and cuvette mode, close system on request
- Analytical modes include kinetic, fixed time, bichromatic end point with/without reagent blank or sample blank, linear or non-linear calibration curves
- Real-time curve monitoring enhances the reliability of result
- Large memory, up to 160 test protocols can be programmed
- Powerful QC function: Westgard Multi-rule, Levey-Jennings plot, 2 controls per test
- Auto self-check when power on
- With lamp sleeping and wake-up function
- Easy software upgrade by SD card, support USB mouse and keyboard
- Multiform result output including patient comprehensive report
- Compact design enables USER-DIY maintenance
- Multi-language software available on request.

## SACA-11904CV, Semi-Auto Chemistry, High Quality Analyzer Special For Veterinary Use



SACA-11904CV

### Features:

- Easy Windows operation system with mouse, large color LCD display.
- Support up to 12 kinds of animal: 8 kinds fixed, 4 kinds open.
- 34 most common tests fixed, 20 more can be defined by user.
- Reagent open system supports flow cell and cuvette mode, close system on request.
- Analytical modes include kinetic, fixed time, bichromatic end point with or without reagent blank or sample blank, linear or non-linear calibration curves
- Real-time curve monitoring enhances the reliability of result
- Powerful QC function: Westguard Multi-rule, Levey-Jennings plot, 2 controls per test
- Auto self-check when power on
- With lamp sleeping and wake-up function
- Easy software upgrade by SD card, support USB mouse and keyboard
- Compact design enables USER-DIY maintenance
- Multi-language software available on request
- Analytical modes include kinetic, fixed time, bichromatic end point with or without reagent blank or sample blank, linear or non-linear calibration curves
- Real-time curve monitoring enhances the reliability of result
- Powerful QC function: Westguard Multi-rule, Levey-Jennings plot, 2 controls per test
- Auto self-check when power on
- With lamp sleeping and wake-up function
- Easy software upgrade by SD card, support USB mouse and keyboard
- Compact design enables USER-DIY maintenance
- Multi-language software available on request.

Model	SACA-11904CV
<b>Principle</b>	Absorbance
<b>Photometric range</b>	-0.500~3.000Abs
<b>Resolution</b>	0.001Abs (displayed), 0.0001Abs (calculated)
<b>Light Source</b>	Halogen lamp
<b>Wavelengths</b>	340, 405, 500, 546, 578, 620, 670nm, 1 more filter optional
<b>Wavelength Accuracy</b>	±1nm
<b>Band Width</b>	8nm
<b>Aspirate Volume</b>	100~300µL
<b>Carryover</b>	<0.1%
<b>Memory</b>	54 test parameters, up to 500 sample results
<b>Interface</b>	RS-232, USB, SD card interface
<b>Flow Cell</b>	25µL Metal-quartz flow cell
<b>Cuvette Mode</b>	12.5mm x 12.5mm cuvette optional
<b>Temperature Control</b>	25°C, 30°C, 37°C, ±0.1°C and ambient temperature
<b>Display</b>	7" color LCD(640 x 240, 256 colors)
<b>Input</b>	USB mouse and external keyboard
<b>Output</b>	Build-in printer or external printer (optional)
<b>Net Weight</b>	8KG
<b>Dimensions(mm)</b>	L460xW330xH140
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz

## SACA-19100, Semi-Auto Chemistry, Grating Inside, PC Controlled



SACA-19100

### Features:

- PC controlled system, Windows XP, displays the reaction curve in real-time.
- Continuously adjustable grating, enhances the stability and reliability of result.
- Reagent-open system supports flow cell & cuvette mode, close system on request
- Analytical modes include kinetic, fixed time, bichromatic end point with or without reagent blank or sample blank, linear or non-linear calibration
- Powerful QC program: Westguard multi-rule, Levey-Jennings plots, 2 controls per test
- Large memory, up to 300 test protocols can be stored
- Multiform result output including patient comprehensive report
- Compatible with all popular external printers connected to PC
- Easy communication with PC
- Powerful internet connection enables remote data sharing and OS update
- Compact design enables USER-DIY maintenance
- Multi-language software available on request.

Model	SACA-19100
<b>Principle</b>	Absorbance
<b>Absorbance Range</b>	-0.500 ~ 3.500Abs
<b>Resolution</b>	0.001 Abs (displayed), 0.0001Abs (calculated)
<b>Light Source</b>	Halogen lamp
<b>Wavelengths</b>	Continuously adjusted grating, wavelength range is 330 - 800nm, 1nm by step adjustment
<b>Wavelength Accuracy</b>	± 1nm
<b>Band Width</b>	< 6nm
<b>Flow cell</b>	Metal - quartz flow cell
<b>Temperature Control</b>	25°C, 30°C, 37°C, ±0.1°C and ambient temperature
<b>Carryover</b>	< 1%
<b>Memory</b>	300 test protocols, up to 10000 test results, support SD to expand memory
<b>Printer</b>	All printers compatible with Windows
<b>Interface</b>	RS-232, USB
<b>Power Supply</b>	AC 100V - 240V ± 10%, 50-60Hz
<b>Net Weight</b>	9KG
<b>Dimensions (mm)</b>	L368xW192xH266

### SACA-19600, Semi-Auto Chemistry, Grating Inside, Touch Screen And USB



SACA-19600

Model	SACA-19600
Principle	Absorbance
Absorbance Range	-0.500 ~ 3.500Abs
Resolution	0.001 Abs (displayed), 0.0001Abs (calculated)
Light Source	Halogen lamp
Wavelengths	Continuously adjusted grating, wavelength range is 330 - 800nm, 1nm by step adjustment
Wavelength Accuracy	± 1nm
Band Width	< 6nm
Flow cell	Metal - quartz flow cell
Temperature Control	25°C,30°C,37°C,±0.1°C and ambient temperature
Carryover	< 1%
Memory	200 test protocols, up to 10000 test results, support SD to expand memory
Display	6.4" color/mono LCD
Interface	RS-232, support VGA,2 USB, SD, Ethernet
Output	Built-in printer, or external printer (optional)
Input	Touch screen, USB mouse and keyboard optional
Power Supply	AC 100V - 240V ± 10%,50-60Hz
Net Weight	11KG
Dimensions (mm)	L370xW284xH318

#### Features:

- Easy Windows operation system with large touch-screen.
- Displays the reaction curve in real-time.
- Continuously adjustable grating, enhances the stability and reliability of result
- Reagent-open system supports flow cell and cuvette mode, close system on request
- Analytical modes include kinetic, fixed time, bichromatic end point with or without reagent blank or sample blank, linear or non-linear calibration
- Powerful QC program: Westguard multi-rule, Levey-Jennings plots, 2 controls per test
- Large memory, up to 200 test protocols and 10000 results can be stored, compatible with SD card
- Multifunction result output including patient comprehensive report
- Multi-interface support RS-232, VGA, USB, SD and Ethernet
- Easy communication with PC
- Powerful internet connection enables remote data sharing and OS update
- Compact design enables USER-DIY maintenance
- Multi-language software available on request.

### SACA-19900, Semi-Auto Chemistry, Grating Inside, Easy Keypad Operation With LCD Display



SACA-19900

Model	SACA-19900
Principle	Absorbance
Absorbance Range	-0.500 ~ 3.500Abs
Resolution	0.001 Abs (displayed), 0.0001Abs (calculated)
Light Source	Halogen lamp
Wavelengths	Continuously adjusted grating, wavelength range is 330 - 800nm, 1nm by step adjustment
Wavelength Accuracy	± 1nm
Band Width	< 6nm
Flow cell	Metal - quartz flow cell
Temperature Control	25°C,30°C,37°C,±0.1°C and ambient temperature
Aspirate Volume	0~3000µl
Carryover	< 1%
Memory	Up to 204 protocols and 5400 results can be stored
Display	LCD display
Interface	RS-232
Output	Built-in printer, or external printer (optional)
Power Supply	AC 110V - 220V ± 10%, 50-60Hz
Net Weight	8KG
Dimensions (mm)	L360xW318xH185

#### Features:

- Easy keypad operation with LCD display
- Continuously adjustable grating, enhances the stability and reliability of result.
- Reagent open system supports flow cell and cuvette mode, close system on request
- Analytical modes include kinetic, fixed time, bichromatic end point with or without reagent blank or sample blank, linear or non-linear calibration curves
- Powerful QC program: Westguard multi-rule, Levey-Jennings plots, 2 controls per test
- Large memory, up to 204 protocols and 5400 results can be stored
- Additional recloser design with lamp saving
- Powerful internet connection enables remote data sharing & OS update
- Compact design enables USER-DIY maintenance
- Multi-language software available on request.

# A MEDICAL ANALYZERS Fully-Automated Chemistry

## FACA-1240, Fully Automated Chemistry, Discrete, Constant Throughput 120 Test/Hours, Random Access



### System Function

Automatic, Random Access, STAT sampling priority, Barcode-Reading support (optional)

### Features:

- Automatic, Random Access.
- Up to 120 tests per hour.
- Reagent pre-heating, liquid level detection.
- Automatic 10 steps washing system (optional), Low carry-over.
- Labor saving. Simple programming and real walk-away operation.
- 24 hours non-stop Reagent cooling compartment.
- Reagent open system, close system on request.
- Micro-volume for sample and reagent.
- User-friendly software based on Windows XP.

Model	FACA-1240
Throughput	Constant throughput around 120 tests/hour
Contents of the testing	Clinical chemistry, Immunoturbidimetric
Analytical modes	End-point, Two-point, Kinetic
Programming	Open system with user defined programs & calculation

### Sample/Reagent Handling

Sample/Reagent tray	40 positions for samples and 40 positions for reagents in refrigerated compartment
Refrigerated temp.	4 ~ 15°C
Reagent volume	R1: 180 ~ 450 $\mu$ L, 1 $\mu$ L adjustable R2: 30 ~ 250 $\mu$ L, 1 $\mu$ L adjustable
Sample volume	3 ~ 45 $\mu$ L, 0.5 $\mu$ L adjustable
Sample & Reagent probe	Collision protection, Liquid level detection & Inventory checking
Probe cleaning	Automatic washing both inside & outside, carry over <0.1%

Pre-heating for reagent

### Reaction System

Reaction positions	81 cuvettes, 9 cuvettes/strip
Cuvette	Optical length 5mm
Reaction volume	180 ~ 500 $\mu$ l
Reaction temp.	37°C, fluctuation $\pm$ 0.1°C

Independent mixing probe, Automatic washing system

### Measuring and Optic System

Lamp	Halogen lamp
Absorption range	0 ~ 3.500Abs $\pm$ 1%
Wavelengths	8 wavelengths, including 340nm,405nm,450nm,510nm, 546nm,578nm,630nm,670nm
Resolution	0.0001ABS

### Working Condition

Power supply	AC 100/240V 50/60 Hz
Temperature	10 ~ 35°C
Humidity	35 ~ 80%
Water consumption	Max 2.5 L/hour
Dimension (cm)	L800xW600xH650
Gross weight	80KG

**CA-01C, 1-Channel Coagulometer With Internal Printer**



**Features:**

- 1 channel (LED detector).
- Easy keypad operation with LCD display.
- Internal thermal-sensitive printer; Electronically-linked Pipette optional.
- Reagent position with magnetic rotor.
- Scattered light and percentage analysis ensure good results
- Open reagent system with low consumption, close reagent on request.
- Large memory to store up to 6000 test results.
- QC & calibration program incorporated.
- Auto self-check when power on.

Model	CA-01C
<b>Analysis Parameters</b>	PT, APTT, TT, FIB, F2, F5, F7, F8, F9, F10, F11, F12, Heparin, APC-R, Protein S, Protein C
<b>Principle</b>	Scattered light with percentage analysis
<b>Sample Volume Required</b>	PT: 25ul, APTT: 25ul, TT: 25ul, FIB: 25ul
<b>Testing Channel</b>	1 Channels
<b>Light Source</b>	Durable LED detector
<b>Sample Position</b>	5 positions
<b>Reagent Position</b>	2 positions (1 magnetic mixer included)
<b>Testing Time</b>	Normally 20~60 secs, Maximum time up to 600 secs
<b>Minimum Reagent Consumption</b>	30μL for APTT, 50μL for FIB, PT, APTT
<b>Position Warming-up</b>	37°C(±0.5°C)
<b>Memory</b>	6,000 test results
<b>Display</b>	LCD display
<b>Interface</b>	RS-232
<b>Input</b>	Easy operation keypad
<b>Output</b>	Internal printer
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz
<b>Net Weight</b>	5KG
<b>Dimension (mm)</b>	L270xW270xH120

**CA-02C, 2-Channel Coagulometer With Internal Printer**



**Features:**

- 2 channel (2 durable LED detectors for 2 different parameters analysis)
- Easy keypad operation with LCD display
- Internal thermal-sensitive printer; Electronically-linked Pipette optional
- Reagent position with magnetic rotor.
- Scattered light and percentage analysis ensure good results.
- Open reagent system with low consumption, close reagent on request

Model	CA-02C
<b>Analysis Parameters</b>	PT, APTT, TT, FIB, F2, F5, F7, F8, F9, F10, F11, F12, Heparin, APC-R, Protein S, Protein C
<b>Principle</b>	Scattered light with percentage analysis
<b>Sample Volume Required</b>	PT: 25μl, APTT: 25μl, TT: 25μl, FIB: 25μl
<b>Testing Channel</b>	2 Channels
<b>Light Source</b>	Durable LED detector
<b>Sample Position</b>	5 positions
<b>Reagent Position</b>	2 positions (1 magnetic mixer included)
<b>Testing Time</b>	Normally 20~60 secs, Maximum time up to 600 secs
<b>Minimum Reagent Consumption</b>	30μL for APTT, 50μL for FIB, PT, APTT
<b>Position Warming-up</b>	37°C(±0.5°C)
<b>Memory</b>	6,000 test results
<b>Display</b>	LCD display
<b>Interface</b>	RS-232
<b>Input</b>	Easy operation keypad
<b>Output</b>	Internal printer
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz
<b>Net Weight</b>	5KG
<b>Dimension (mm)</b>	L270xW270xH120

• Large memory to store up to 6000 test results • QC and calibration program incorporated • Auto self-check when power on • Multi-language software available on request.

## CA-04C, 4-Channel Coagulometer With Touch Screen



CA-04C

### Features:

- 4 channels (4 durable LED detectors for 4 different parameters analysis).
- Easy Windows operation system with touch screen or mouse, large LCD display.
- Advanced scattered light principle and percentage analysis ensure accurate results.
- Low reagent consumption.
- Large memory, up to 10,000 results can be stored
- QC and calibration program incorporated
- Multiform result output including patient comprehensive report
- Easy software upgrade by SD card, support USB mouse & keyboard
- Auto self-check when power on
- Electronically-linked Pipette.

Model	CA-04C
<b>Analysis Parameters</b>	PT, APTT, TT, FIB, F2, F5, F7, F8, F9, F10, F11, F12, Heparin, APC-R, Protein S, Protein C
<b>Principle</b>	Scattered light with percentage analysis
<b>Sample Volume Required</b>	PT: 25ul, APTT: 25ul, TT: 25ul, FIB: 25ul
<b>Testing Channel</b>	4 Channels
<b>Light Source</b>	Durable LED detector
<b>Sample Position</b>	24 positions
<b>Reagent Position</b>	6 positions (1 magnetic mixer included)
<b>Testing Time</b>	Normally 20~60 secs, Maximum time up to 600 secs
<b>Minimum Reagent Consumption</b>	25µL for TT, FIB, PT, APTT
<b>Position Warming-up</b>	37°C(±0.5°C)
<b>Memory</b>	10,000 test results
<b>Display</b>	6" LCD display
<b>Interface</b>	RS-232, USB, SD card interface
<b>Input</b>	Touch panel or USB mouse
<b>Output</b>	External printer (optional)
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz
<b>Net Weight</b>	8KG
<b>Dimension (mm)</b>	L410×W310×H160

## UA-15, Compact Size for Urine Test



UA-15

Model	UA-15
<b>Test Items</b>	Ascorbic Acid, Bilirubin, Blood, Glucose, Ketone, Leucocytes, Nitrite, PH, Protein, Specific Gravity, Urobilinogen
<b>Throughput</b>	Normal mode, 60 samples/hour; Continuous mode, 120 samples/hour
<b>Display</b>	5" Large LCD
<b>Memory</b>	1000 sample results
<b>Output</b>	Built-in thermal printer
<b>Interface</b>	RS-232
<b>Power supply</b>	AC 110-220V±10%, 50~60Hz
<b>Net weight</b>	2KG
<b>Dimensions(mm)</b>	L185×W260×H157

### Features:

- Compact size, low weight
- 11 test items; Cold light source, high luminosity with long life time
- 5" large LCD display
- Auto save data in case of power failure
- Up to 1000 results can be stored
- Build in thermal printer
- Easy connection with PC by RS-232
- Easy accessible design enables USER-DIY maintenance.





**FACO-050**

## FACO-050, Auto Coagulation Analyzer

### Features:

- Random Access, smart and compact
- Clotting, Chromogenic, Immunologic measuring methods
- User friendly touchscreen interface, simple & easy to operate
- High throughput routine assays
- Labor saving, simple programming and real walk-away system
- Reagent open system, close system on request
- Multi-language software (optional).

### System Function:

- Throughput: 60 tests/hour for PT  
50 tests/hour for PT and APTT
- Parameters: PT, APTT, Tl, FIB, AT-III, PLG, D-Dimer, FDP, etc.
- Measuring methods:  
Clotting: Scattered Light Detection method  
Chromogenic: Colorimetric method, 405nm  
Immunologic: Turbidimetric method, 575nm
- Memory: 100,000 test results and 10,000 reaction curves
- Quality control: 12 QC File\*10 test items\*30 curve\*12 month
- Calibration, 6 points\*10 items
- Automatic, Random Access
- STAT sample priority
- Barcode-reading support (optional).

### Status Menu



### 7 Detection Channels

- 5 for clotting assays
- 1 for chromogenic assays
- 1 for immunologic assays.



**Sample/Reagent Probe with Liquid Level Detection.**

### Sample Tray:

- Sample tray: 27 positions. user-defined STAT
- Incubation temperature: 37±0.5°C.

### Reagent Tray:

- Reagent tray: 23 positions
- Reagent cooling: ≤16°C.

### Reaction Tray:

- Cuvettes on board, 72
- Min reaction volume: 150ul
- Reaction temperature: 37±0.5°C.

### Probe:

- With probe pre-heating
- Automatic washing both inside and outside
- With collision protection, liquid level detection and inventory checking.

### Print out:

- Built-in thermal printer, external printer optional.

### Measuring and Optic System:

- Light: LED
- Power: AC 110/240V, 50-60± 1 Hz
- Temperature: 10°C-30°C, humidity ≤85%
- Water consumption: <0.5L/hour
- Dimension LxWxH (mm) : 660x580x510
- Weight: 53KG.



## ELA-6000, Electrolyte Analyzer



### Test range and accuracy:

Channel	Range	Resolution	CV%
pH	4.00 ~ 9.00	0.01	< 0.5
K <sup>+</sup>	0.50 ~ 15.00 mmol/L	0.01	< 1.0
Na <sup>+</sup>	30.0 ~ 200.0 mmol/L	0.1	< 1.0
Cl <sup>-</sup>	20.0 ~ 200.0 mmol/L	0.1	< 1.0
Ca <sup>++</sup>	0.1 ~ 6.0 mmol/L	0.01	< 1.5
TCO <sub>2</sub> <sup>+</sup>	2.0 ~ 70.0 mmol/L	0.1	< 3.0
Li <sup>+</sup>	0.1 ~ 5.0 mmol/L	0.01	< 2.0

### Working environment:

Ambient Temperature	5°C ~ 35°C
Relative Humidity	≤ 85%
Sun Radiation	Avoid direct sunshine
Power Supply	AC 220V±10V (50/60HZ)

**Sample type:** Plasma, Serum, Blood, Urine

### Features:

- Larger LCD with touch-screen(320x240)
- Self-made maintenance free electrodes
- Sleep mode to save reagent
- Rapid test speed. 25 seconds/test
- Min-volume sample consumption: 60µL
- Reagent pack to avoid pollution
- On-line instructions provided for self problem-solving
- Protection function when powered-off suddenly
- Setting any time to power-off the equipment, to save reagent when free
- Randomly choose any combination of pH, K, Na, Cl, Ca, TCO<sub>2</sub>, li, Ag channels.

### Main characters:

Flow Path	Fluid Moving system
Reagent pack	Calibration solution in a single reagent pack
Calibration	Automatic or On-demand
Memory Storage	Up to 1000 patient result, extended to be over 20000 results
Analyzing Time	25 seconds after aspiration
Sample Volume	60~300µL whole blood or serum
Input	Touch screen(with operation menu)
Output	Internal thermal-printer ; RS232
Auto sampler	- 35 samples volume (for optional function) - 39x31.5x36cm, N.W: 6.5kg
Waste Storage	Closed Pack System
Reagent Pack	Closed Reagent System
Dimensions	42x37x56 cm
Net weight	16 kg

## ELA-5100, Electrolyte Analyzer



**Sample type:** Plasma, Serum, Blood, Urine

### Test range and accuracy:

Channel	Range	Resolution	CV%
pH	6.00 ~ 9.00	0.01	< 1.0
K <sup>+</sup>	0.50 ~ 10.00 mmol/L	0.01	< 1.0
Na <sup>+</sup>	20.0 ~ 200.0 mmol/L	0.1	< 1.0
Cl <sup>-</sup>	20.0 ~ 200.0 mmol/L	0.1	< 1.0
Ca <sup>++</sup>	0.3 ~ 5.0 mmol/L	0.01	< 1.5
Li <sup>+</sup>	0.1 ~ 3.0 mmol/L	0.01	< 1.5

### Working environment:

Ambient Temperature	5°C ~ 40°C
Relative Humidity	≤ 85%
Sun Radiation	Avoid direct sunshine
Power Supply	AC100-240V(50/60HZ)

### Features:

- Self-made maintenance free electrodes
- Sleep mode to save reagent
- Rapid test speed. 30 seconds/test
- Min-volume sample consumption: 651µL
- Reagent pack to avoid pollution
- On-line instructions provided for self problem-solving
- High efficient cleaning procedures, best for fatty samples
- High, middle and low QC values provided to adjust linearity
- Randomly choose any combination of pH, K, Na, Cl, Ca, Li channels
- Automatic one point & two points calibration with additional manual calibration.

### Main characters:

Flow Path	Fluid Moving system
Reagent pack	Calibration solution in a single reagent pack
Calibration	Automatic or On-demand
Memory Storage	Up to 1500 patient result, 199 normal QC, 199 Abnormal QC
Analyzing Time	30 seconds after aspiration
Sample Volume	Minimum 65µL whole blood or serum
Display	Wide LCD (240x128)
Input	Keypad (16 alphabet Numeric display, YES or NO)
Output	Internal thermal-printer ; RS232
Waste Storage	Closed Pack System
Reagent Pack	Closed Reagent System
Dimensions	30x26x36 cm
Net weight	7.5 kg

**ESRA-300, ESR Analyzer**



**Features:**

- Random access
- Up to 30 samples can be scanned simultaneously
- Throughput up to 60 samples /hour
- Temperature compensation refer to 18°C according to Westergren method
- ESR curve display and print-out
- Touch screen, large LCD display
- Internal thermal printer.

**Technical Specification:**

Model	ESRA-300
Application area	Erythrocyte sedimentation rate analysis
Measuring principle	Infrared sensor
Reading channels	30 available channels
Loading capability	Up to 30 samples at a time
Loading pattern	Random
Measuring time	30 minutes or 60 minutes selectable
Throughput	Up to 60 samples per hour
Analysis result	In Westergren ESR value (mm/hr)
Temperature compensation	Refer to 18°C automatically (selectable)
Reading resolution	0.2mm
Reproducibility	< 0.3% or 2mm/1h
Result resolution	1mm/1h
Blood level range	50mm ~ 64mm
Display	LCD
Input	Touch screen
Interface	RS-232 serial port
Print	Internal thermal printer
Power supply	AC 220V/110V ±10%, 50/60/Hz, 50W
Operation conditions	15°C~32°C Humidity ≤85%
Dimension	400mm×300mm×200mm(L×W×H)
Net weight	11.5kg

**ESRA-300A, ESR Analyzer**



**Features:**

- Infrared optical detection technology
- Automatically scanning blood cells and location of the plasma interface from time to time with accurate positioning
- Automatically amending the ESR results under the detecting temperature (15°C ~ 32°C) to the ESR values at 18°C, closely - related with Westergren results
- The results are not interfered by high levels of hemoglobin, bilirubin or triglyceride
- ESR curve display and print-out
- Internal thermal printer.

**Technical Specification:**

Model	ESRA-300A
Measuring principle	Infrared sensor
Measuring time	30 minutes
Measuring precision	<0.2 mm
Reproducibility	< 3%
Temperature Precision	<0.3°C
Sample volume	<1.6mL whole blood anticoagulant
Reading channel	10
Display	LCD
Interface	RS-232 serial port
Print	Internal thermal printer
Operation conditions	15°C~32°C , Humidity ≤85%
Power supply	AC 220V/110V ±10%, 50/60 Hz
Dimension	320mm×260mm×158mm (L×W×H)
Net weight	5.0kg

# A AUTOCLAVES Table Top



**STE-TEN**

### STE-TEN, 1 Liter Autoclave

It adopts B-class (prED-13060), with 3-times pre-vacuum preceding vacuum drying. Residual humidity is <math>\lt; 0.2</math>, vacuum measurement reaches  $-0.7\text{bar}$ .

It sterilizes and sanitizes miscellaneous packed or unpacked medical instruments, whether solid or A-type hollow, whether with multi-apertures or inset pipes. It efficiently rid air from every hollow area of any hollow instrument, such as hand-piece, making sure that water steam reaches every corner. It is installed with BOWIC & DICK which measures the penetration of water steam. Mini printer can be attached to record the process of sterilization.



Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber size	Outside size(mm)	Weight (kg)
<b>STE-TEN</b>	220/50	1100	1	Ø90x160mm	W200xH385xD450	30 (Net:28)



**STE-TAN-8L**

### STE-TAN-8L, 8 Liter Autoclave

Adopting European N standard, with thermal vacuuming & drying function, it can be used for A type hollow instruments and solid instruments

#### Technical feature:

- Sterilization temperature: 121, 134 Cent degrees
- Drying Program: Thermal Vacuum drying
- Digital display
- Sterilization record: mini external printer is available
- Safety: safety valve, temperature control, pressure protection system, temperature protector of chamber wall
- Sterilization and drying time adjustable help you to get the best sterilization effect
- Open type water storage tank
- Quick drain connector
- Optional type B: STE-8L(B).

Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber Size (mm)	Outside size (mm)	Weight (kg)
<b>STE-8LN</b>	AC220V/50Hz	1400W	8L	Φ170x320mm	W345xH530xD340	34 (Net:30)
<b>STE-8LB</b>		1500W				37 (Net:34.5)



**STE-TAN**

### STE-TAN, 16 Liter Autoclave

Adopting N-class (prED-13060), with thermal vacuumizing and drying function, it can be used for A-type hollow instruments & solid instruments. Thermodynamic vacuum guarantees elimination of cold air from the cavity and makes sure of perfect saturation of water steam. Three sterilizing water quantity selections are respectively for different material, which embodies the individualized service. Automatic malfunction detecting system makes easy maintaining.

- Liquid Sterilizing option
- Optional Printer



Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber size	Outside size (mm)	Weight (kg)
<b>STE-TAN</b>	220/50	1900	16	Ø230x360mm	W440xH400xD560	64 (Net:43)



**STE-TIN, 16 Liter Vacuum Autoclave**

It adopts B-class (prED-13060), with 3-times pre-vacuum preceding vacuum drying. Residual humidity is <0.2: vacuum measurement reaches -0.7bar. It sterilizes and sanitizes miscellaneous packed or unpacked medical instruments, whether solid or A-type hollow, whether with multi-apertures or inset pipes. It efficiently rid air from every hollow area of any hollow instrument, such as hand-piece, making sure that water steam reaches every corner. It is installed with BOWIC & DICK which measures the penetration of water steam. Mini printer can be attached to record the process of sterilization.

Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber size	Outside size (mm)	Type	Weight (kg)
<b>STE-TIN</b>	220/50	2000	16	Ø230x360mm	W440xH400xD560	B	64 (Net:45)



**STE-18L, 18 Liter Autoclave**

**Technical features:**

- According to EN13060 standard completely
- Manual door locking system
- Sterilization temperature: 121, 134 Cent degrees
- Programs: 10 programs (Including test programs)
- Test program; Helix test, B&D test, Vacuum test
- Drying Program: Vacuum drying
- LCD display
- Sterilization record: mini external printer is available
- Safety: safety valve, temperature control, pressure protection system, temperature protector of chamber wall
- Independent steam generator inside
- Sterilization and drying time adjustable help you to get the best sterilization effect
- Open type water storage tank
- Quick drain connector.

Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber size	Outside size (mm)	Type	Weight (kg)
<b>STE-TIN-18L</b>	220/50	2200	18	Ø247x450mm	W480xH590xD455	B	Net: 47
<b>STE-TAN-18L</b>		2100		Ø247x350mm		N	Net: 45



**STE-23L, 23 Liter Autoclaves**

It adopts B-class (prED-13060), with 3-times pre-vacuum preceding vacuum drying. Residual humidity is <0.2, vacuum measurement reaches -0.7bar. It sterilizes & sanitizes miscellaneous packed or unpacked medical instruments, whether solid or A-type hollow, whether with multi-apertures or inset pipes. It efficiently rid air from every hollow area of any hollow instrument, such as hand piece, making sure that water steam reaches every corner. It is installed with BOWIC & DICK which measures the penetration of water steam. Mini printer can be attached to record the process of sterilization. Optional type N: with liquid sterilization.



Model	Voltage (V/Hz)	Power (W)	Capacity (L)	Chamber size	Outside size (mm)	Type	Weight (kg)
<b>STE-TIN-23</b>	220/50	2200	23	Ø247x450mm	W480xH699xD455	B	Net: 51
<b>STE-TAN-23</b>		2100				N	Net: 48
<b>STE-TIN-23T</b>		2200	25	Ø230x580mm	-	T	Net: 58

**Documentation:**

1. Printer: an external printer is optional.
2. USB port: it is used for connecting a USB stick, all sterilization data are automatically written in the USB stick and can be read directly in any PC and stored electronically.
3. Internal memory: the last 20 cycles can be automatically stored in the autoclave system, which can be print out at any time.



# A AUTOCLAVES Table Top, 45–80 Liter



## STE-HT-45/60/80, 45, 60 or 80 Liter Steam Sterilizers

STE-HT series sterilizer is an automatic high temperature and pressure rapid sterilizer which works with steam as medium. It can be widely used in department of stomatology and ophthalmology, operating room, supply room, dialysis room, delivery room & other medical institutions. It is suitable for all wrapped or unwrapped solid instruments, A-class cavity instrument (dental handpieces and endoscopes), implantable instruments, dressing fabric and rubber tubes, etc.

### Features

**Build-in open type water tank** The sterilizer adopts easy-clean open type water tank that equipped with water quality monitor to ensure the reliability of steam quality and sterilizer operation.

**Brand-new operation interface** The LCD screen can display temperature, pressure, time, operating status, failure warning and other information. It is convenient for customers to observe the sterilizer running status.

**Multiple security protective device** Overheat auto protective device; multiple control and protection for steam generator; safe door interlock; double overpressure protection; electronic circuit safety device.

**Automatic door** STE-HT-45 series adopt auto door structure that can effectively prevent scald. STE-HT-60/80 series door structure adopt multipoint stitching technology to ensure seal reliability. The door equipped with convenient one-button switch.

**High-efficiency ultimate vacuum** The sterilizer adopts high-efficiency low-noise vacuum system which has excellent effects. The ultimate vacuum value can reach -90KPa or above.

**Multiple program types** The system has various programs that include: wrapped items, unwrapped items, rubber items, custom program, rapid program, BD testing program, vacuum testing program, preheat program and drying program.

**High-efficiency steam generator** STE-HT-45 equipped with

build-in instant steam generator.

STE-HT-60/80 equipped with build-in energy-storing steam generator.

**Other features** 0.22μm high-efficiency sterilizing filter that guarantees the air is sterile and prevents repeated contamination. All the processes of water injection, pulse vacuum, heating up, sterilization, exhausting and drying are automatic.

### Optional configuration.

Record type: printer.

Electronic storage: USB flash disk.

Remote monitoring: software.

Power: 110v/100v/240v.



Model	Voltage	Power	Capacity	Chamber Size	Package size (mm)	Design Pressure (MPa)	Design Temp. (°C)	Temp. Range (°C)	Net weight
STE-HT-45	220V 50/60Hz	3.8Kw	45L	Ø316x618mm	L830xW640xH550	-0.1/0.3MPa	144°C	105-136°C	115kg
STE-HT-60		7Kw	60L	Ø385x595mm	L1002xW730xH560				160kg
STE-HT-80		7Kw	80L	Ø385x717mm	L1002xW730xH560				180kg



## DIST, 1.5 Liter/hour Distillator

Autoclave must adopt distilled water as operation medium.

Even Purified water has various minerals, & can produce furring scale after evaporation at high temperature, which, after a period of time, can lead to leaking of steam due to improper closure. It can also lead to the clog in the narrow pipes and pressure sensor, to the malfunction of temperature sensor and to other failures.

Once the furring scale enters hand piece and other instrument which are hollow inside or has apertures, it will clog the narrow pipes and axis, lowering the turning speed of hand piece, thus reducing its life span. Therefore, using distilled water is necessary.

Model	Voltage V/Hz	Power (W)	Distilled water L/h	Chamber size	Outside size	Weight	Packing size
DIST	220/50	750	1.5	Ø180x200mm	290x290x390mm	3.5kg	245x285x510mm



**STE-V-80**

### Main Technical Parameters

- Designed pressure: 0.26Mpa.
- Designed temperature: 150°C.
- Rated working pressure: 0.22Mpa.
- Sterilization temperature: 105°C-136°C.
- Sterilization time range: 0-99min.
- Material of chamber: SUS 304 stainless steel.
- Accessories: 2 stainless steel sterilization baskets.

### Safety Devices

- Auto protection device against over temperature: This system cuts off power automatically if the designed temperature is surpassed. Light and sound alarm meanwhile.
- The program will be stopped if water level lower than the low limit. alarm with sound and light.
- Door safety interlock. The door cannot be opened until there is no pressure in the chamber and power for heating cannot be switched on until the door is firmly closed.
- Safety valve of auto release against overpressure It opens when the designed pressure is surpassed.
- Heat insulation dock shelter: the door is made of high performance heat insulation material. not only beautiful but also prevents the operator to be injured.
- Over current and creepage protector.

### STE-V-60/80, Automated Water Filling Vertical Autoclave

- Microcomputer control technique. touch-key. LCD display the menu.
- Automatic control over the processes of filling water, heating, sterilization, steam exhaust and dryness.
- There are equipped with dressing, instrument, rubber, culture medium sterilization and keep warm. culture medium and keep warm programs for customer's choice.
- Process, temperature, time dynamic LCD displayed, Fault automatic displayed and alarm.
- Positive pressure pulse function exhaust cool air of chamber thoroughly and ensure the steam saturation.
- Rapid and slow exhaust steam Automatic control function, It avoids liquid overflow while sterilization.
- Automatic maintenance function, The program will be continued when the power connection again.
- The buzzer alarms when a cycle of operation is completed.
- Preheating control function.
- Built-in water tank. Steam and water circulation system. no external water source. not exhaust steam outside. environment is clean and dryness.
- Horizontal sliding door, self- bulge seal ring. operated easily.
- Printer is available for optional.



**Baskets**



**STE-V-80**

Model	Capacity	Chamber Size	Outside Size (mm)	Net weight	Voltage	Power
<b>STE-V-60</b>	50L	Ø315xL668mm	616x476x990	65kg	220V/50Hz	4.2Kw
<b>STE-V-80</b>	80L	Ø386xL695mm	688x546x1030	75kg	380V/50Hz	4.5Kw



**SK310-230**

### SK310-230/SK410-230, Heat Sealer, sealing width - 300/400mm

- It fits nearly everywhere for world-wide use in laboratory.
- Polyethylene, polypropylene films can be easily sealed.
- Easy to handle with convenient and reasonable structure.
- Powerful transformer and high quality circuit components guarantee years operation.

Model	SK310-230	SK410-230
<b>Available resin</b>	polyethylene, polypropylene	
<b>Sealing width</b>	2mm	
<b>Sealing length</b>	300mm	400mm
<b>Weight</b>	4.3kg	5.4kg
<b>Dimensions (mm)</b>	W440xD85xH175	W530xD85xH175
<b>Wattage</b>	390W	750W
<b>Power</b>	AC 110V/220V, 50/60Hz	

# A AUTOCLAVES Vertical, Economy

## UTFB/UTKBS, Full Stainless steel Hand Wheel Type of Quick-open Door Structure Pressure Safety Lock



UTKBS-50LV

Computer control auto recycle sterilization, LCD screen indicate working state, Temp. scope 50-126°C, Time scope 0-99h, Overpressure auto-discharging 0.145-0.165MPa, Automatic shut down with beep reminding after sterilization, Hand wheel type of quick-open door structure, Pressure safety lock.



UTKBS-50LV

**ECONOMY**



UTFB-30LV

### Vertical Pressure Autoclave

- Computer control auto recycle sterilization.
- LCD Screen indicate working state.
- Temp. scope 50-134°C.
- Time scope 0-99h.
- Overpressure auto-discharging 0.145-0.165Mpa.
- Automatic shut down with beep reminding after sterilization.

**Optional: Printer.**



UTFB-30LV

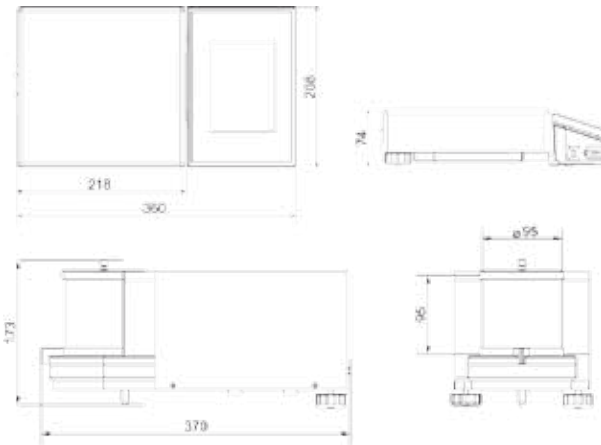
Model	UTFB-30LV	UTKBS-50LV	UTKBS-75LV	UTKBS-100LV	UTKBS-150LV
Capacity	30L	50L	75L	100L	150L
Power source	220V	220V	220/380V	380V	380V
Consumed power	3kw	3.5kw	3.5/4.5kw	4.5kw	6kw
Chamber Site	Ø350x330	Ø350x520	Ø388x650	Ø500x550	Ø500x760
Weight	60kg	80kg	90kg	100kg	120kg
Outside Size (mm)	580x580x1000	600x580x1250	600x600x1400	630x630x1300	630x630x1450



**MGB-2U, Ultra Micro Balance**



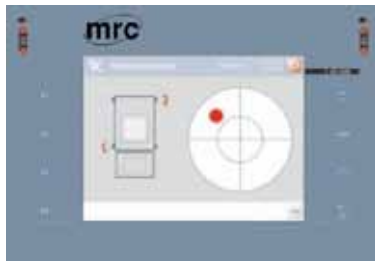
MGB-2U



MGB-U Series of micro balances have been designed to meet the high requirements of mass measurements with the highest precision. Measurement reliability & accuracy is ensured by internal calibration. Micro balances consist of two major parts (an electronic system and a precise mechanical measurement system in a separate enclosure). This solution eliminates the temperature influence and separates from shocks and vibrations caused by users operating software. All the elements of the balance are made of glass and steel which eliminates the influence of electrostatics on the weighing process.

**Optional accessories:**

- Anti-vibration table
- Printer
- Set for the determination of air
- Foot tare and print buttons
- Professional weighing table
- Ultrasonic air ionizer with humidifier
- Standard mass
- Computer software



**Electronic level indicator**

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts

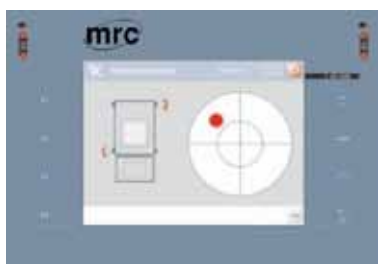
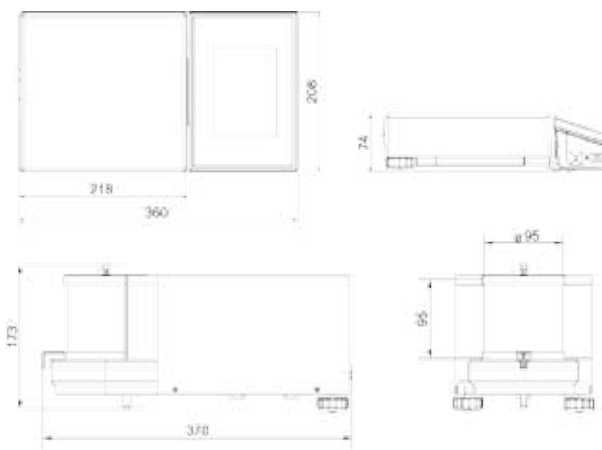


**Infrared proximity sensors**

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment

Model	MGB-2U
Max capacity	2g
Readability	0.1 µg
Repeatability	0.25 µg
Linearity	±0.5 µg
Pan size	ø 16 mm
Weighing chamber dimensions	ø 90 x 90 mm
Stabilization time	10-20 s
Calibration	automatic (internal)
Working temperature	+18 ° - +30 °C
Interface	RS 232, 2 x USB, Ethernet
Power supply	230V / 11V AC
Display	5.7" touch screen

### MGB-Series, Micro Balances



#### Electronic level indicator

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts

MGB Series of microbalances have been designed to meet the high requirements of mass measurements with the highest precision. Measurement reliability and accuracy is ensured by internal calibration.

Microbalances consist of two major parts (an electronic system and a precise mechanical measurement system in a separate enclosure). This solution eliminates the temperature influence and separates from shocks and vibrations caused by users operating software.

All the elements of the balance are made of glass and steel which eliminates the influence of electrostatics on the weighing process.

#### Optional accessories:

- Anti-vibration table
- Printer
- Set for the determination of air
- Foot tare and print buttons
- Additional attachment for Pipettes calibration
- Professional weighing table
- Ultrasonic air ionizer with humidifier
- Standard mass
- Computer software



#### Infrared proximity sensors

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment



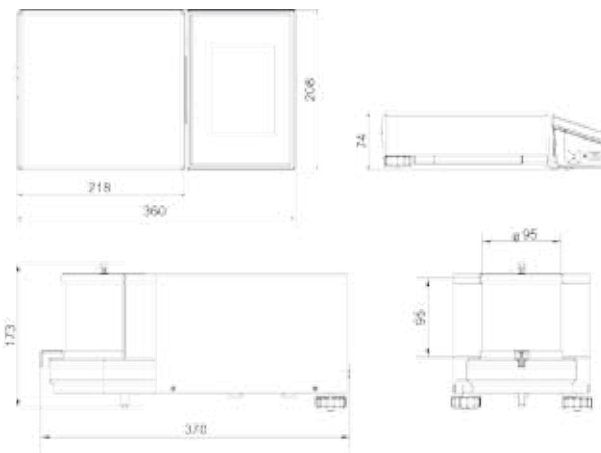
Model	MGB-2	MGB-3	MGB-5	MGB-11	MGB-21
<b>Max capacity</b>	2g	0.8/3g	5g	11g	21g
<b>Readability</b>	1 µg	1/10 µg	1 µg	1 µg	1 µg
<b>Tare range</b>	-2g	-3g	-5g	-11g	-21g
<b>Repeatability*</b>	1 µg	1 µg	1.6 µg	2.0 µg (to 5g) 2.5 µg (5g-11g)	2.0 µg (to 5g) 2.5 µg (5g-11g) 3.0 µg (11g-21g)
<b>Linearity</b>	±3 µg	±3 µg	±5 µg	±6 µg	±7 µg
<b>Eccentric load deviation</b>	3 µg	3 µg	5 µg	6 µg	7 µg
<b>Sensitivity offset</b>	1.5 x 10 <sup>-6</sup> x Rt			3 x 10 <sup>-6</sup> x Rt	4 x 10 <sup>-6</sup> x Rt
<b>Sensitivity temperature drift</b>	1 x 10 <sup>-6</sup> / °C x Rt				
<b>Sensitivity stability</b>	1 x 10 <sup>-6</sup> / Rok x Rt				
<b>Minimum weight (USP)</b>	3mg	3mg	6.3mg	6.3mg	6.3mg
<b>Minimum weight (U = 1%, k = 2)</b>	0.2mg	0.2mg	0.4mg	0.4mg	0.4mg
<b>Pan size</b>	Ø16mm	Ø16mm+ Ø60mm (weighing pan for filters)	Ø26mm		
<b>Weighing chamber dimensions</b>	Ø90 x 90mm				
<b>Stabilization time</b>	5 s				
<b>Adjustment/Calibration</b>	automatic (internal)				
<b>Working temperature</b>	+18 ° - +30 °C				
<b>Change rate of working temp.</b>	±0.3 °C/h (±1 °C/8h)				
<b>Atmospheric humidity</b>	45% - 65%				
<b>Change rate of atmospheric humidity</b>	±1%/h (±4%/8h)				
<b>Interface</b>	2xUSB, 2xRS 232, Ethernet, 2in/2out (digital)				
<b>Power supply</b>	230V / 11V AC				
<b>Display</b>	5.7" touch screen				

\*Repeatability as a standard deviation from 10 weighing cycles

## MGB-21P, Micro Balance for Pipette Calibration



MGB-21P



### Electronic level indicator

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts



### Infrared proximity sensors

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment

MGB Series of microbalances have been designed to meet the high requirements of mass measurements with the highest precision.

Measurement reliability & accuracy is ensured by internal calibration.

Microbalances consist of two major parts (an electronic system and a precise mechanical measurement system in a separate enclosure). This solution eliminates the temperature influence and separates from shocks and vibrations caused by users operating software.

All the elements of the balance are made of glass and steel which eliminates the influence of electrostatics on the weighing process.

### Optional accessories:

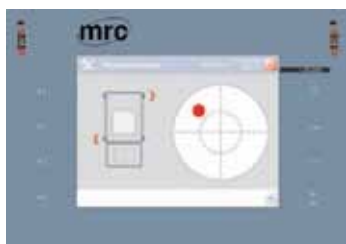
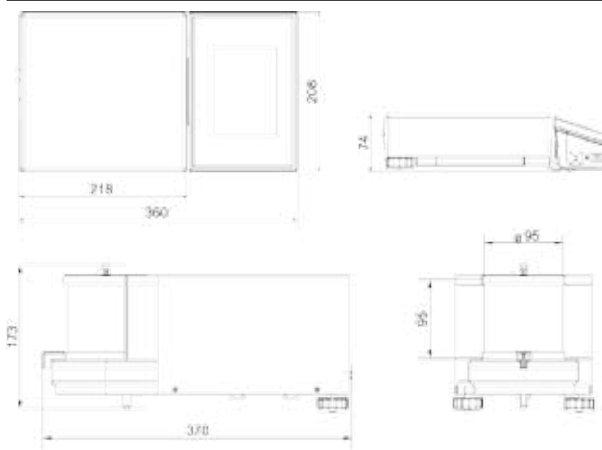
- Anti-vibration table
- Printer
- Set for the determination of air
- Foot tare and print buttons
- Professional weighing table
- Ultrasonic air ionizer with humidifier
- Standard mass
- Computer software



Model	MGB-21P
Max capacity	21g
Readability	1 µg
Repeatability	2.1 µg (to 2g) / 2.5 µg (2g/5g) / 3.1 µg (5g/11g) / 3.8 µg (11g/21g)
Linearity	±7 µg
Eccentric load deviation	7 µg
Sensitivity offset	4 × 10 <sup>-6</sup> × Rt
Sensitivity temperature drift	1 × 10 <sup>-6</sup> / °C × Rt
Sensitivity time drift	1 × 10 <sup>-6</sup> / Rok × Rt
Minimum weight (USP)	6.3mg
Minimum weight (U = 1%, k = 2)	0.4mg
Pan size	Ø26mm
Weighing chamber dimensions	Ø90 x 90mm
Stabilization time	5 s
Calibration	automatic (internal)
Working temperature	+18° - +30°C
Interface	2xUSB, 2xRS 232, Ethernet, 2in/2out (digital)
Power supply	110 / 230 V AC / 50 / 60 Hz / 13.5 / 16 V DC / 1.1 A / 11W
Display	5.7" touch screen

\*Repeatability as a standard deviation from 10 weighing cycles

### MGB-F Series, Micro Balances for filter Weighing



#### Electronic level indicator

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts

MGB Series of microbalances have been designed to meet the high requirements of mass measurements with the highest precision.

Measurement reliability & accuracy is ensured by internal calibration.

Microbalances consist of two major parts (an electronic system and a precise mechanical measurement system in a separate enclosure). This solution eliminates the temperature influence and separates from shocks and vibrations caused by users operating software.

All the elements of the balance are made of glass and steel which eliminates the influence of electrostatics on the weighing process.



Special chamber with a pan for filter weighing

#### Optional accessories:

- Anti-vibration table
- Printer
- Set for the determination of air
- Foot tare and print buttons
- Professional weighing table
- Ultrasonic air ionizer with humidifier
- Standard mass
- Computer software



#### Infrared proximity sensors

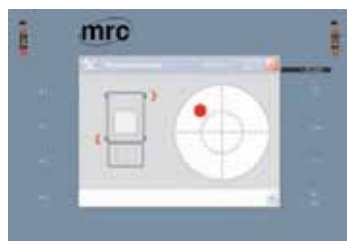
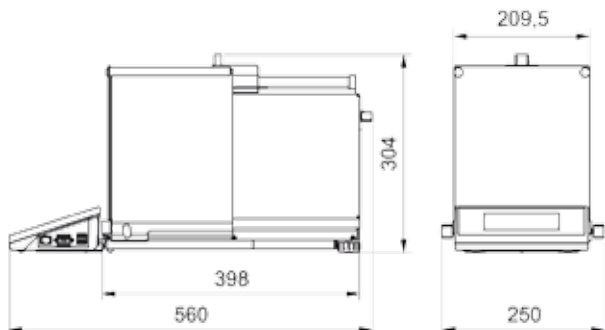
- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment



Model	MGB-3F	MGB-5F	MGB-5F1
Max capacity	0.8/3g	5g	5g
Readability	1/10µg	1µg	1µg
Repeatability	1µg	1.6µg (< 2g); 2.5µg (2g-5g)	1µg
Linearity	±3µg	±5µg	±5µg
Eccentric load deviation	3µg	5µg	5µg
Sensitivity offset	1.5 x 10 <sup>-6</sup> x Rt		
Sensitivity temperature drift	1 x 10 <sup>-6</sup> /°C x Rt		
Sensitivity stability	1 x 10 <sup>-6</sup> /Rok x Rt		
Minimum weight (USP)	3mg	6.3mg	6.3mg
Minimum weight (U=1%, k= 2)	0.2mg	0.4mg	0.4mg
Pan size	Ø16 + Ø60 mm (weighing pan for filters)	Ø100 mm	Ø160 mm
Weighing chamber DIM.	Ø90 x 90 mm	Ø118 x 35 mm	Ø168 x 35 mm
Stabilization time	5 s		
Adjustment / Calibration	automatic (internal)		
Working temperature	+18° - +30°C		
Interface	2xUSB, 2xRS 232, Ethernet, 2in/2out (digital)		
Power supply	110 / 230 V AC / 50 / 60 Hz / 13.5 / 16 V DC / 1.1 A		
Display	5.7" touch screen		
Change rate of working temperatures	±0.3 °C/h (±1 °C/8h)		
Atmospheric humidity	45% - 65%		
Change rate of atmospheric humidity	±1%/h (±4%/8h)		
Display	5.7" touch screen		

Rt - net weight

ASX-Y Series, Analytical Balances



Electronic level indicator

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts



Infrared proximity sensors

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment

Analytical balances of ASX/Y type has been designed on the basis of new electronic modules & up-to-date technology.

Measurement reliability & accuracy is assured by internal calibration triggered by time flow or temperature conditions.

Balances are equipped with spacious weighing chamber with automatically opened side glass doors. Balances are operated by using a touch panel covering a 5.7" color graphic display. Scales have implemented new easily operated software. Dismountable glass-door for easy cleaning.

Optional accessories:

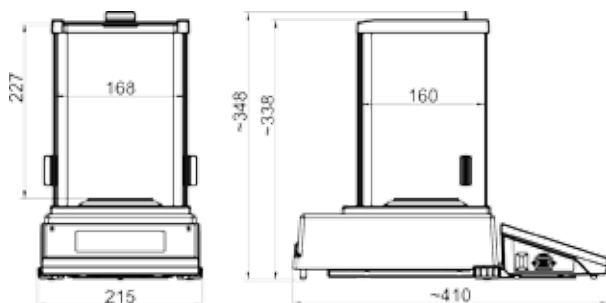
- Anti-vibration table (mild steel or stainless steel)
- Printer
- Density kit for solids & liquids
- PC KEYBOARD
- Foot button for tare or print functions
- Additional LCD display
- External rechargeable battery with charger
- Computer software

- Statistics
- Counting pieces
- Formula
- Filling
- Formulation
- Animal weighing
- Air Buoyancy Correction
- Density determination
- Infrared Sensors
- GLP
- GLP Procedures
- Pipette Calibration
- Chckweighing
- Percentage

Model	ASX-50Y/A	ASX-110Y/A	ASX-80-220Y/A	ASX-220Y/A	ASX-310Y/A
Max capacity	50g	100g	80/220g	220g	310g
Minimal load	1 mg	1 mg	1 mg	10 mg	10 mg
Readability	0.01 mg	0.01 mg	0.01/0.1 mg	0.1 mg	0.1 mg
Tare range	-50g	-100g	-220g	-220g	-310g
Working temperature	+10° - +50°C				
Repeatability	0.025mg (to 20g) 0.03mg (20g/50g)	0.02mg (to 20g) 0.025mg (20g/60g) 0.04mg (60g/110g)	0.025mg (to 60g) 0.04mg (60g/80g) 0.08mg (80g/220g)	0.08mg	0.08mg (to 220g) 0.2mg (220g/310g)
Linearity	±0.06mg	±0.07mg	±0.06/0.2mg	±0.2mg	±0.3mg
Eccentric load deviation	0.06mg	0.07mg	0.2mg	0.2mg	0.3mg
Sensitivity offset	2 × 10 <sup>-6</sup> × Rt				
Sensitivity temp. drift	1 × 10 <sup>-6</sup> / °C × Rt				
Sensitivity time drift	1 × 10 <sup>-6</sup> / Year × Rt				
Minimum weight (USP)	75mg			240mg	
Min. weight(U=1%, k=2)	5mg			16mg	
Stabilization time	5 s	5 s	5 s / 3 s	3 s	3 s
Interface	2xUSB, RS 232, Ethernet, 2in/2out (digital)				
Power supply	110 / 230V AC / 50 / 60Hz / 13.5 - 16V DC / 1.1A				
Adjustment/Calibration	internal (automatic)				
Display	5.7" touch screen				
Pan size	Ø85mm	Ø85mm	Ø85mm	Ø100mm	Ø100mm
Weighing chamber DIM.	170x200x220mm				
Net weight/Gross weight	9.4/12.5kg	9.4/12.5kg	9.4/12.5kg	9.5/12.6kg	9.5/12.6kg

A=Automatically open side glass door

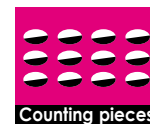
### ASB-Y Series, Analytical Balances



Analytical balances Series ASB-Y are designed with application of new electronic modules and up-to-date technological solutions. Measurement reliability & accuracy is assured by system of internal adjustment / calibration triggered by time flow or temperature conditions. Balances are operated through a modern electronic module touch panel covering a 5.7" color graphic display. Scales feature new version of implemented software ensuring easy and intuitive operation.

#### Optional accessories:

- Anti-vibration table
- Printers
- Holders for glass vessels
- Tare and "Print" foot button
- Computer software
- Antistatic ionizer
- Ambient conditions module
- Density determination kit
- LCD additional display
- PC keyboard
- Additional adapter for Pipettes calibration
- Power adapter with battery and charger
- Rack for under hook weighing
- Standard mass
- Antistatic cable
- Bar code scanner
- Cable RS 232



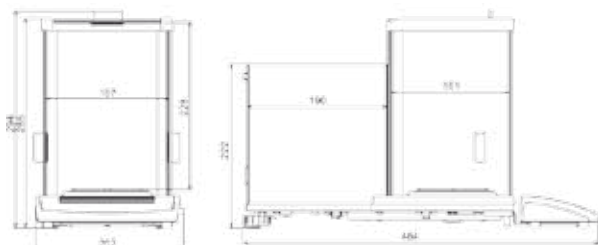
Model	ASB-220-Y	ASB-310-Y	ASB-510-Y
Max capacity	220g	310g	510g
Minimal load	10mg	10mg	10mg
Readability	0.1mg	0.1mg	0.1mg
Tare range	-220g	-310g	-510g
Working temperature	+10° - +45°C		
Repeatability*	0.1mg	0.1mg (220g) 0.2mg (220g-310g)	0.1mg (220g) 0.2mg (310g) 0.3mg (510g)
Linearity	±0.2mg	±0.3mg	±0.4mg
Stabilization time	3.5 s		
Sensitivity drift	2 ppm/°C in temperature +15° - +35°C		
Interface	2×USB, RS 232, Ethernet		
Power supply	110 / 230V AC / 50 / 60Hz / 13.5 / 16V DC / 1.1A		
Adjustment/Calibration	internal (automatic)		
Display	5.7" touch screen		
Pan size	Ø85mm		

\*Repeatability as a standard deviation from 10 weighing cycles

ABX-X Series, Analytical Balances



ABX-X



ABX/X balances are equipped with big backlit graphic display with extended menu, 12-keys membrane keyboard, big weighing chamber with sliding upper glass door and side glass door. Balance accuracy is guaranteed by automatic internal calibration dependant on time & temperature changes.

Balances have possibility of disconnecting the head from weighing chamber. This solution considerably reduces vibrations transferred to weighing chamber and decreases dimensions of device.

ABX/X balances enable to generate GLP procedures, these balances have RS 232 socket, PS/2, possibility of connecting additional display and possibility of weighing loads outside the main weighing platform (so called under-hook weighing).

Optional accessories:

- Anti-vibration table (mild steel or stainless steel)
- Printers
- Density kit for solids and liquids
- PC KEYBOARD
- Foot button for tare or print functions
- Additional LCD display
- External rechargeable battery with charger
- Computer software

- **New electronics and technological solutions!**
- **New intuitive operation & user friendly software of balances!**



Model	ABX-110X	ABX-82-220X	ABX-100X	ABX-160X	ABX-220X	ABX-310X
Max capacity	100g	80/220g	100g	160g	220g	310g
Minimal load	1mg	1mg	10mg	10mg	10mg	10mg
Readability	0.01mg	0.01/0.1mg	0.1mg	0.1mg	0.1mg	0.1mg
Tare range	-100g	-220g	-100g	-160g	-220g	-310g
Working temp.	+10° - +50°C					
Repeatability*	0.025mg (to 20g) 0.03mg (20g-60g) 0.045mg (60g-100g)	0.025mg (to 82g) 0.08mg(82g-220g)	0.045mg	0.08mg	0.08mg	0.08mg (to 220g) 0.2mg(220g-310g)
Linearity	±0.07mg	±0.06/0.2mg	±0.07mg	±0.2mg	±0.2mg	±0.3mg
Eccentric load deviation	0.07mg	0.2mg	0.07mg	0.2mg	0.2mg	0.3mg
Sensitivity offset	2x10 <sup>-6</sup> xRt					
Sensitivity temp. drift	1x10 <sup>-6</sup> /°CxRt					
Sensitivity stability	1x10 <sup>-6</sup> /axRt					
Min. weight (USP)	75mg			240mg		
Min. weight (U=1%, k=2)	5mg			16mg		
Stabilization time	5 s	5 s / 3 s	3 s	3 s	3 s	3 s
Power supply	230V AC / 50:60Hz / 11V AC / 1100mA					
Adjustment/Calibration	Internal (Automatic)					
Pan size	Ø85mm	Ø85mm	Ø100mm	Ø100mm	Ø100mm	Ø100mm
Net/Gross weight	9.4/12.5 kg					

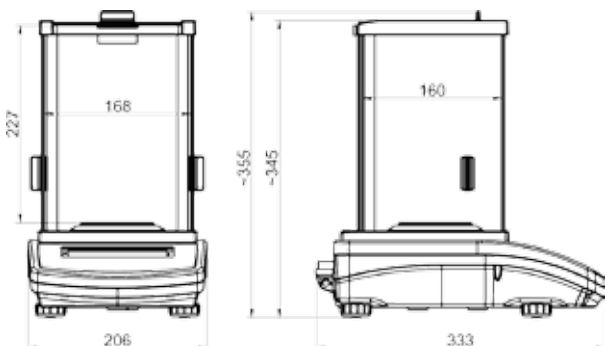
\*Repeatability as a standard deviation from 10 weighing cycles

### ASB-X Series, Analytical Balances



Balances Series ASB/X represent standard level of analytical balances. They are equipped with backlit graphic display. Accuracy and precise measurement of the balances are determined by automatic internal calibration, dependant on time & temperature changes. Analytical balances ASB/X Series are offered with following capacities: 110, 160, 220, 310 g with readability of 0,1 mg, 60 g with readability of 0,01 mg and 60/220 g with readability of 0,01/0,1 mg. ASB/X balances are equipped with optional Pipette calibration as well as automatic door opening system. GLP procedure of these balances is a report from calibration process of the balance, and this information has unchangeable shape (no modification possible). User has access to big measuring chamber with sliding doors and sliding top glass. Each balance is equipped with RS 232 output and possibility of connection of additional display as standard. Balances are equipped with possibility of weighing loads outside the main weighing platform (so called under hook weighing). This means of mass measuring is an

alternative for loads with non-standard dimensions and shapes and those which create magnetic field. Under hook weighing is also applied for density determination procedures.



#### Optional accessories:

- Anti-vibration table (Mild Steel or Stainless Steel)
- Printers
- Density kit for solids & liquids
- Rack for under hook weighing
- Additional LCD Display
- External rechargeable battery with charger
- Suitcase for balance
- Computer software

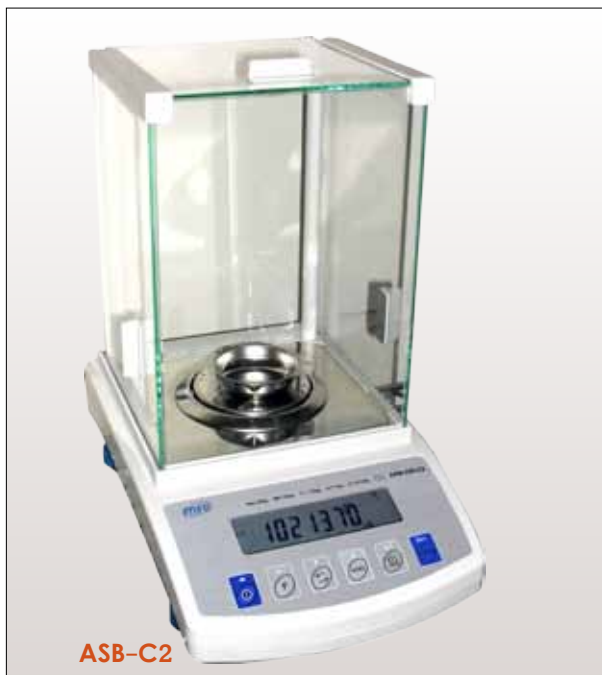


Model	ASB-110X	ASB-160X	ASB-220X	ASB-310X
<b>Max capacity</b>	110g	160g	220g	310g
<b>Minimal load</b>	10mg	10mg	10mg	10mg
<b>Readability</b>	0.1mg	0.1mg	0.1mg	0.1mg
<b>Tare range</b>	-110g	-160g	-220g	-310g
<b>Working temperature</b>	+10° - +45°C			
<b>Repeatability*</b>	0.1mg	0.1mg	0.1mg	0.1mg (220g) 0.2mg (220g-310g)
<b>Linearity</b>	±0.2mg	±0.2mg	±0.2mg	±0.3mg
<b>Sensitivity drift</b>	2ppm/°C in temperature +15° - +35°C			
<b>Stabilization time</b>	3.5s			
<b>Power supply</b>	110 / 230V AC / 50 / 60Hz / 13.5 / 16V DC / 1.1A / 3W			
<b>Calibration</b>	internal (automatic)			
<b>Pan size</b>	Ø85mm			
<b>Net/Gross weight</b>	5.5/8.2kg	5.6/8.3kg	5.6/8.3kg	5.6/8.3kg
<b>Packaging size</b>	495 x 385 x 515mm			

\*Repeatability as a standard deviation from 10 weighing cycles



ASB Series, Analytical Balances



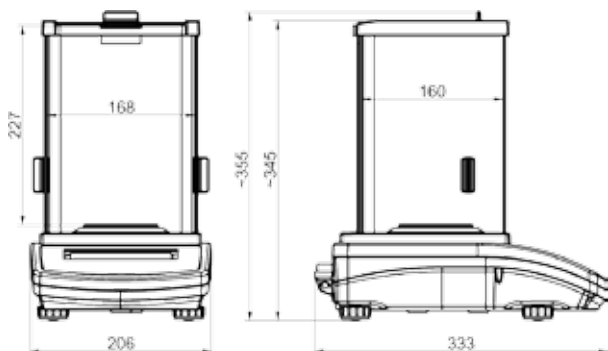
Balances Series ASB represent standard level of analytical balances. They are equipped with backlit LCD display. Accuracy and precise measurement of the balances are determined by internal calibration, dependant on time and temperature changes.

Analytical balances ASB Series are offered with following capacities: 110, 160, 220, 310 g with readability of 0,1 m g and 60/220 with readability 0,1/0,01 mg and 100 g with readability 0,01 mg.

GLP procedure of these balances is a report from calibration process of the balance, and this information has unchangeable shape (no modification possible). User has access to big measuring chamber with sliding doors and sliding top glass. Each balance is equipped with RS 232 output and possibility of connection of additional display as standard.



Balances have possibility of weighing loads under the weighing pan, i.e. under-hook weighing. In such case the mass of load is measured under the pan. It is an alternative for loads with non-standard dimensions, shapes and loads which create magnetic field. Under-hook weighing is also applied for density determination of materials.



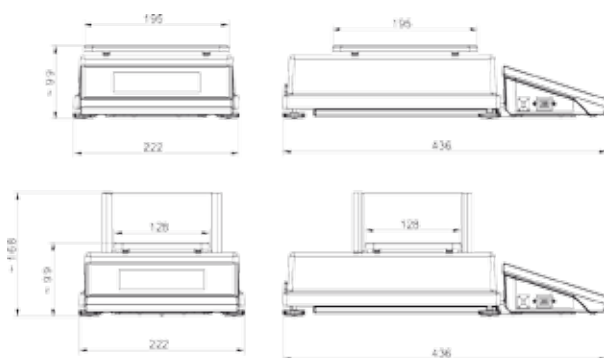
Optional accessories:

- Anti-vibration table (mild steel or stainless steel)
- Printers
- Density kit for solids and liquids
- Rack for under hook weighing
- Additional LCD display
- External rechargeable battery with charger
- Computer software

Model	ASB-60-220-C2	ASB-110-C2	ASB-160-C2	ASB-220-C2	ASB-310-C2
Max capacity	60/220g	110g	160g	220g	310g
Minimal load	1mg	10mg	10mg	10mg	10mg
Readability	0.01mg/0.1mg	0.1mg	0.1mg	0.1mg	0.1mg
Tare range	-220g	-110g	-160g	-220g	-310g
Working temperature	+10°C -+45°C				
Repeatability*	0.03/0.1mg	0.1mg	0.1mg	0.1mg	0.1mg
Linearity	±0.07/0.3mg	±0.2mg	±0.2mg	±0.2mg	±0.3mg
Sensitivity drift	2 ppm/°C @ temperature +15°C -+35°C				
Stabilization time	6 s / 3.5 s	3.5 s	3.5 s	3.5 s	3.5 s
Sensitivity drift	2ppm/°C in temperature +15° - +35°C				
Working temperature	+10° - +45°C				
Pan size	Ø70mm	Ø85mm			
Power supply	110 / 230V AC / 50 / 60Hz / 13.5 / 16V DC / 1.1A / 3W				
Adjustment/Calibration	internal (automatic)				
Display	LCD (backlit)				
Net/Gross weight	5.6/8.3kg	5.5/8.2kg	5.6/8.3kg	5.6/8.3kg	5.6/8.3kg
Packaging size	495x385x515mm				

\*Repeatability as a standard deviation from 10 weighing cycles

### BPS-Y Series, Precision Balances



Precise balances of BPS/Y are the response for the growing market demands concerning simple operation and maximum automation of the weighing process.

Measurement reliability and accuracy is assured by internal calibration triggered by time flow or temperature conditions.

Balances equipped in a new electronic module & are operated using a touch panel covering a 5.7" color graphic display.

Y scales have implemented new easily operated software.

#### Optional accessories:

- Anti-vibration table
- Printers
- Density determination kit for solids & liquids
- PC keyboard
- Foot button for tare or print functions
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software



Model	BPS-200-2000-Y	BPS-250-Y	BPS-450-Y	BPS-600-Y	BPS-750-Y	BPS-1000-Y
<b>Max capacity</b>	200/2000 g	250 g	450 g	600 g	750 g	1000 g
<b>Minimal load</b>	20 mg	20 mg	20 mg	20 mg	20 mg	20 mg
<b>Readability</b>	1/10 mg	1 mg	1 mg	1 mg	1 mg	1 mg
<b>Tare range</b>	-2000 g	-250 g	-450 g	-600 g	-750 g	-1000 g
<b>Working temp.</b>	+15 - +30 °C					
<b>Repeatability</b>	1/10 mg	1 mg	1 mg	1.5 mg	1.5 mg	1.5 mg
<b>Linearity</b>	±2/10 mg	±2 mg	±2 mg	±2 mg	±3 mg	±3 mg
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18 - +30°C					
<b>Stabilization time</b>	2 s / 1.5 s	2 s	2 s	2 s	2 s	2 s
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC					
<b>Pan size</b>	128x128 mm					
<b>Net/Gross weight</b>	5/7.1 kg	4.1/6 kg	4.4/6.3 kg	4.4/6.3 kg	4.4/6.3 kg	4.4/6.3 kg
<b>Packaging size</b>	570x325x225 mm					

Model	BPS-1500-Y	BPS-2500-Y	BPS-4500-Y	BPS-6000-Y	BPS-8000-Y*
<b>Max capacity</b>	1500 g	2500 g	4500 g	6000 g	8000 g
<b>Minimal load</b>	500 mg	500 mg	500 mg	500 mg	500 mg
<b>Readability</b>	10 mg	10 mg	10 mg	10 mg	10 mg
<b>Tare range</b>	-1500 g	-2500 g	-4500 g	-6000 g	-8000 g
<b>Working temp.</b>	+15 - +30 °C				
<b>Repeatability</b>	10 mg	10 mg	10 mg	15 mg	20 mg
<b>Linearity</b>	±20 mg	±20 mg	±20 mg	±30 mg	±15 mg
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18 - +30°C				
<b>Stabilization time</b>	1.5 s	1.5 s	1.5 s	1.5 s	1.5 s
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>Pan size</b>	195x195 mm				
<b>Net/Gross weight</b>	5/7.1 kg	5/7.1 kg	5/7.1 kg	5/7.1 kg	3.4/5.3 kg
<b>Packaging size</b>	570x325x225 mm				

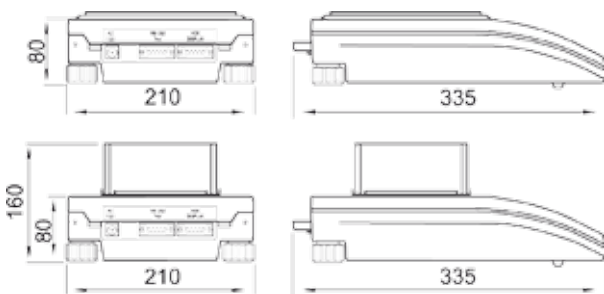
\* external calibration

**BPS-X Series, Precision Balances**



the weighing pan . All the balances Series BPS-X feature internal calibration system. Each balance is equipped with RS 232 and RS485 outputs, PS/2 socket and additional LCD display plug. GLP procedure is available in a form of a report from balance calibration. shape of the printout is modifiable. User name, project name, print of date and time, and print frame are user defined on printout.

Balances are equipped with optional weighing of loads outside the weighing pan, so called under hook weighing. it is an alternative for weighing loads with non standard dimensions or made of magnetic substances. Under hook weighing is additionally applied in case of density determination procedure.

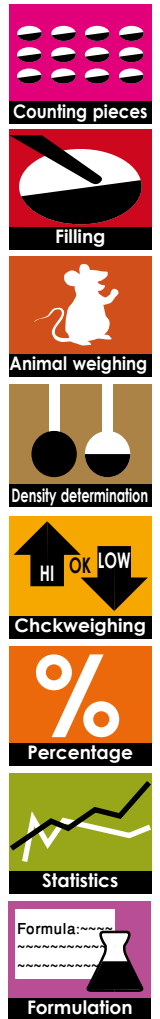


Balances Series BPS-X are new types of precision balances with large graphic backlit display & extended user menu. The balances comprise all the features and functions of WPX balances and also the newest electronic and mechanical solutions and upgraded software.

The electronic and mechanical structure is similar to balances Series BPS. They are equipped with 12 key membrane keyboard, which ensures easier more intuitive operation for the user. Pan dimension in this Series is 195x195 or 128x128 mm with a draught shield over

**Optional accessories:**

- Anti-vibration table
- Printers
- Density kit for solids and liquids
- PC keyboard
- Foot button for tare or print functions
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software



Model	BPS-200-2000-X	BPS-250-X	BPS-450-X	BPS-750-X	BPS-1000-X
<b>Max capacity</b>	200/2000g	250g	450g	750g	1000g
<b>Minimal load</b>	20mg	20mg	20mg	20mg	20mg
<b>Readability</b>	1/10mg	1mg	1mg	1mg	1mg
<b>Tare range</b>	-2000g	-250g	-450g	-750g	-1000g
<b>Linearity</b>	±2/10mg	±2mg	±2mg	±3mg	±3mg
<b>Repeatability</b>	1/10mg	1mg	1mg	1.5mg	1.5mg
<b>Pan size</b>	128x128mm				
<b>Stabilization time</b>	2 s / 1.5 s	2 s	2 s	2 s	2 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C				
<b>Working temperature</b>	+15° - +30°C				
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>Net weight/Gross weight</b>	5/7.1kg	4.1/6kg	4.4/6.3kg	4.4/6.3kg	4.4/6.3kg
<b>Packaging size</b>	570x325x225mm				

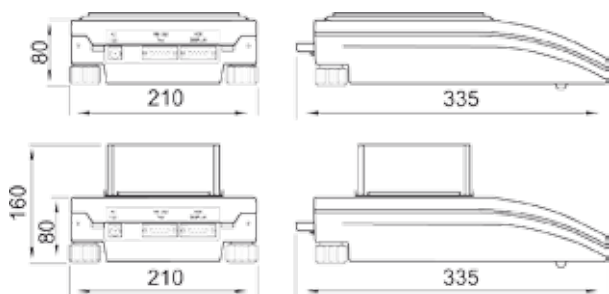
Model	BPS-1500-X	BPS-2500-X	BPS-4500-X	BPS-6000-X	BPS-8000-X*
<b>Max capacity</b>	1500g	2500g	4500g	6000g	8000g
<b>Minimal load</b>	500mg	500mg	500mg	500mg	500mg
<b>Readability</b>	10mg	10mg	10mg	10mg	10mg
<b>Tare range</b>	-1500g	-2500g	-4500g	-6000g	-8000g
<b>Linearity</b>	±20mg	±20mg	±20mg	±30mg	±15mg
<b>Repeatability</b>	10mg	10mg	10mg	15mg	20mg
<b>Pan size</b>	195x195mm				
<b>Stabilization time</b>	1.5 s	1.5 s	1.5 s	1.5 s	1.5 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C				
<b>Working temperature</b>	+15° - +30°C				
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>Net weight/Gross weight</b>	5/7.1kg	5/7.1kg	5/7.1kg	5/7.1kg	3.4/5.3kg
<b>Packaging size</b>	570x325x225mm				

\* external calibration

### BPS-C1 Series, Precision Balances



Balances Series BPS are equipped with 12 key front panel and LCD backlit display. Pan dimension is this Series is 195x195 or 128x128 mm with a glass shield over the weighing pan which protects the load against possible breeze. Each balance has RS 232 and additional display outputs as standard. GLP procedure is available in a form of a report from balance calibration. Shape of the printout is modifiable. User name, project name, print of date and time, and print frame are user defined on printout. Balances marked as C/1 are equipped with system of external calibration. Balances are equipped with optional weighing of loads outside the weighing pan, so called under hook weighing. It is an alternative for weighing loads with non standard dimensions or made of magnetic substances. Under hook weighing is additionally applied in case of density determination procedure.



Balances Series BPS are equipped with 12 key front panel and LCD backlit display. Pan dimension is this Series is 195x195 or 128x128 mm with a glass shield over the weighing pan which protects the load against possible breeze. Each balance has RS 232 and additional display outputs as standard.

GLP procedure is available in a form of a report from balance calibration. Shape of the printout is modifiable. User name, project name, print of date and time, and print frame are user defined on printout.

Balances marked as C/1 are equipped with system of external calibration. Balances are equipped with optional weighing of loads outside the weighing pan, so called under hook weighing. It is an alternative for weighing loads with non standard dimensions or made of magnetic substances. Under hook weighing is additionally applied in case of density determination procedure.

#### Optional accessories:

- Anti-vibration table
- Printers
- Density determination kit for solids & liquids
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software



Model	BPS-200-2000-C1	BPS-210-C1*	BPS-360-C1	BPS-510-C1	BPS-750-C1	BPS-1000-C1
<b>Max capacity</b>	200/2000g	210g	360g	510g	750g	1000g
<b>Minimal load</b>	20mg	20mg	20mg	20mg	20mg	20mg
<b>Readability</b>	1/10mg	1mg	1mg	1mg	1mg	1mg
<b>Tare range</b>	-2000g	-210g	-360g	-510g	-750g	-1000g
<b>Linearity</b>	±2/10mg	±2mg	±2mg	±2mg	±3mg	±3mg
<b>Repeatability</b>	1/10mg	1mg	1mg	1mg	1.5mg	1.5mg
<b>Pan size</b>	128x128mm					
<b>Stabilization time</b>	2 s / 1.5 s	2 s	2 s	2 s	2 s	2 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C					
<b>Working temp.</b>	+15° - +30°C					
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC					
<b>Net\Gross weight</b>	3.3/5.2kg	3.2/5.1kg	3.2/5.1kg	3.2/5.1kg	3.2/5.1kg	3.2/5.1kg
<b>Packaging size</b>	570x325x225mm					

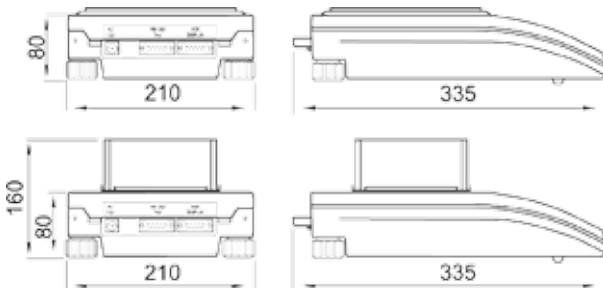
Model	BPS-1200-C1*	BPS-2100-C1*	BPS-3500-C1	BPS-4500-C1	BPS-6000-C1	BPS-8000-C1
<b>Max capacity</b>	1200g	2100g	3500g	4500g	6000g	8000g
<b>Minimal load</b>	500mg	500mg	500mg	500mg	500mg	500mg
<b>Readability</b>	10mg	10mg	10mg	10mg	10mg	10mg
<b>Tare range</b>	-1200g	-2100g	-3500g	-4500g	-6000g	-8000g
<b>Linearity</b>	±20mg	±20mg	±20mg	±20mg	±20mg	±20mg
<b>Repeatability</b>	10mg	10mg	10mg	10mg	15mg	15mg
<b>Pan size</b>	195x195mm					
<b>Stabilization time</b>	1.5 s	1.5 s	1.5 s	1.5 s	1.5 s	1.5 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C					
<b>Working temp.</b>	+15° - +30°C					
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC					
<b>Net\Gross weight</b>	3.2/5.1kg	3.4/5.3kg	3.4/5.3kg	3.4/5.3kg	3.4/5.3kg	3.4/5.3kg
<b>Packaging size</b>	570x325x225mm					

\* verified balances

**BPS-C2 Series, Precision Balances**



system of internal automatic calibration. Balances are equipped with optional weighing of loads outside the weighing pan, so called under hook weighing. it is an alternative for weighing loads with non standard dimensions or made of magnetic substances. Under hook weighing is additionally applied in case of density determination procedure.



Balances Series BPS are equipped with 12 key front panel and LCD backlit display. Pan dimension in this Series is 195x195 or 128x128 mm with a glass shield over the weighing pan which protects the load against possible breeze. Each balance has RS 232 and additional display outputs as standard.

GLP procedure is available in a form of a report from balance calibration. shape of the printout is modifiable. User name, project name, print of date and time, and print frame are user defined on printout. Balances marked as C2 are equipped with

**Optional accessories:**

- Anti-vibration table
- Printers
- Density determination kit for solids & liquids
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Computer software



Model	BPS-200-2000-C2	BPS-210-C2*	BPS-360-C2	BPS-600-C2	BPS-750-C2	BPS-1000-C2
<b>Max capacity</b>	200/2000g	210g	360g	600g	750g	1000g
<b>Minimal load</b>	20mg	20mg	20mg	20mg	20mg	20mg
<b>Readability</b>	1/10mg	1mg	1mg	1mg	1mg	1mg
<b>Tare range</b>	-2000g	-210g	-360g	-600g	-750g	-1000g
<b>Linearity</b>	±2/10mg	±2mg	±2mg	±2mg	±3mg	±3mg
<b>Repeatability</b>	1/10mg	1mg	1mg	1mg	1.5mg	1.5mg
<b>Pan size</b>	128x128mm					
<b>Stabilization time</b>	2 s / 1.5 s	2 s	2 s	2 s	2 s	2 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C					
<b>Working temp.</b>	+15° - +30°C					
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC					
<b>Net/Gross weight</b>	4.3/6.2kg	3.5/5.4kg	3.5/5.4kg	3.7/5.6kg	3.7/5.6kg	4.3/6.2kg
<b>Packaging size</b>	570x325x225mm					

Model	BPS-1200-C2*	BPS-2100-C2*	BPS-3500-C2*	BPS-4500-C2*	BPS-6000-C2*
<b>Max capacity</b>	1200g	2100g	3500g	4500g	6000g
<b>Minimal load</b>	500mg	500mg	500mg	500mg	500mg
<b>Readability</b>	10mg	10mg	10mg	10mg	10mg
<b>Tare range</b>	-1200g	-2100g	-3500g	-4500g	-6000g
<b>Linearity</b>	±20mg	±20mg	±20mg	±20mg	±20mg
<b>Repeatability</b>	10mg	10mg	10mg	10mg	15mg
<b>Pan size</b>	195x195mm				
<b>Stabilization time</b>	1.5 s	1.5 s	1.5 s	1.5 s	1.5 s
<b>Sensitivity drift</b>	2 ppm/°C in temperature +18° - +30°C				
<b>Working temp.</b>	+15° - +30°C				
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>Net/Gross weight</b>	4/5.9kg	4.6/6.5kg	4.6/6.5kg	4.6/6.5kg	4.6/6.5kg
<b>Packaging size</b>	570x325x225mm				

\* verified balances

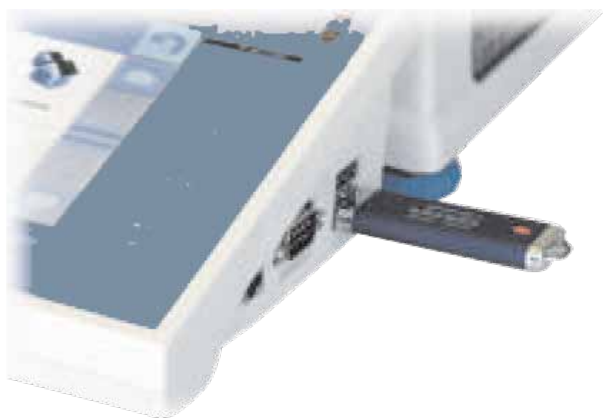
#### BWY Series, Precision Balances



BWY

#### Separable Indicator

The possibility of detach the indicator from the weighing chamber significantly limits shocks and vibrations that are moved on the weighing chamber, increases the ergonomics of operation



#### Data exchange through USB storage devices

- Updating balance software
- Exporting weighing data
- Exporting/importing databases
- Exporting/importing balance settings
- Exchanging data between balances

Precise balances of BWY are the response for the growing market demands concerning simple operation and maximum automation of the weighing process.

Balances equipped in a new electronic modules & are operated using a touch panel covering a 5.7" color graphic display. Y scales have implemented new easily operated software.

Dual range version for BWY scale:

- 290x360 mm: 6-12-C1R, 12-30-C1R, 6-12-C1K, 12-30-C1K;
- 400x500 mm: 30-60-C2R, 60-120-C2R, 30-60-C2K, 60-120-C2K.



#### Infrared proximity sensors

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment

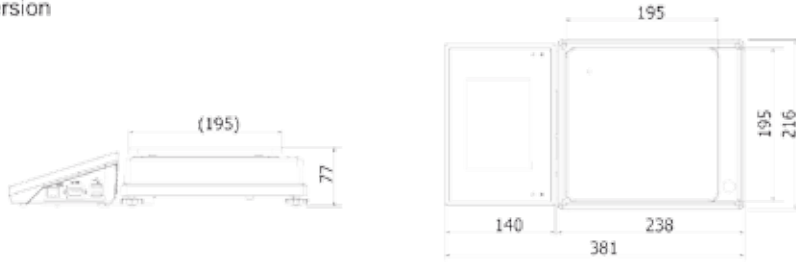
#### Optional accessories:

- Printers
- PC keyboard
- Rack for under hook weighing
- LCD Display
- Calibration weight
- Standard mass
- Density determination kit
- Power adapter with battery and charger
- Suitcase for balance
- Computer software
- RS 232 Cables

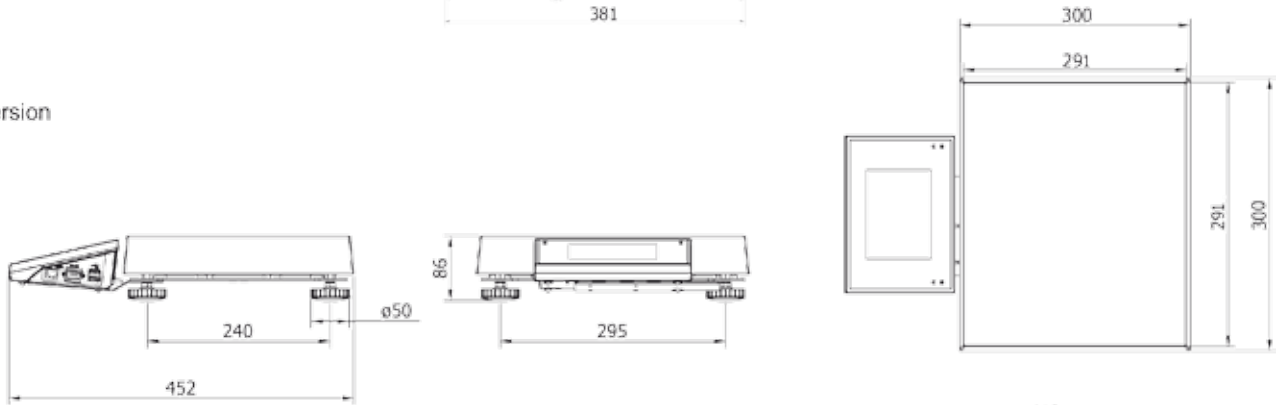
#### Communication interfaces



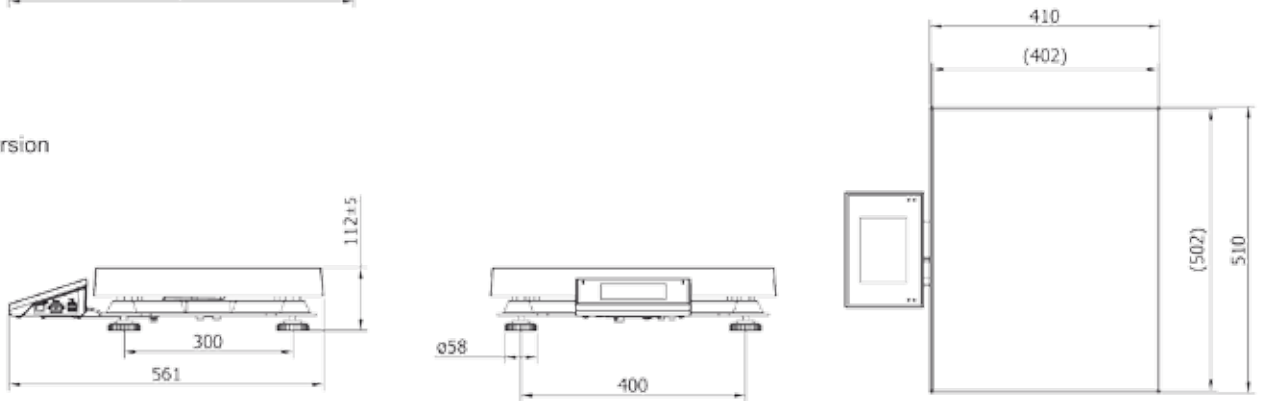
D2 version



C1 version



C2 version



Model	BWY-1-D2	BWY-2-D2	BWY-6-D2	BWY-10-D2	BWY-20-D2
<b>Max capacity</b>	1kg	2kg	6kg	10kg	20kg
<b>Readability</b>	0.01g	0.01g	0.1g	0.1g	0.1g
<b>Tare range</b>	-1kg	-2kg	-6kg	-10kg	-20kg
<b>Repeatability</b>	0.03g	0.03g	0.1g	0.2g	0.2g
<b>Linearity</b>	±0.03g	±0.03g	±0.1g	±0.2g	±0.2g
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>IP rating</b>	IP 54				
<b>Pan size</b>	195x195 mm				
<b>Interface</b>	2xUSB, RS 232, Ethernet, 4in / 4out digital				
<b>Display</b>	5.7" touch screen				

Model	BWY-6-C1R BWY-6-C1K	BWY-12-C1R BWY-12-C1K	BWY-30-C1R BWY-30-C1K	BWY-60-C1R BWY-60-C1K	BWY-120-C1R BWY-120-C1K
<b>Max capacity</b>	6kg	12kg	30kg	60kg	120kg
<b>Readability</b>	0.1g	0.2g	0.5g	1g	2g
<b>Tare range</b>	-6kg	-12kg	-30kg	-60kg	-120kg
<b>Repeatability</b>	0.2g	0.4g	1g	3g	6g
<b>Linearity</b>	±0.2g	±0.4g	±1g	±3g	±6g
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC				
<b>IP rating</b>	IP 54				
<b>Pan size</b>	300x300 mm	300x300 mm	300x300 mm	400x500 mm	400x500 mm
<b>Interface</b>	2xUSB, RS 232, Ethernet, 4in / 4out				
<b>Display</b>	5,7" touch screen				

### BPP-Y Series, Precision Balances



BPP-Y

#### Optional accessories:

- Printers
- PC Keyboard
- Foot Button for Tare or Print Functions
- Additional LCD Display
- External rechargeable battery pack
- Calibration weight
- Computer software

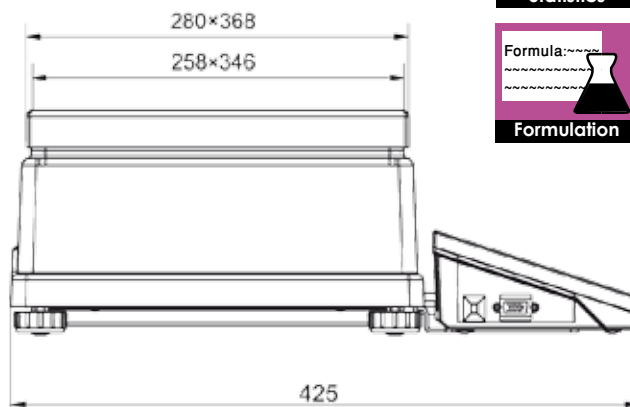
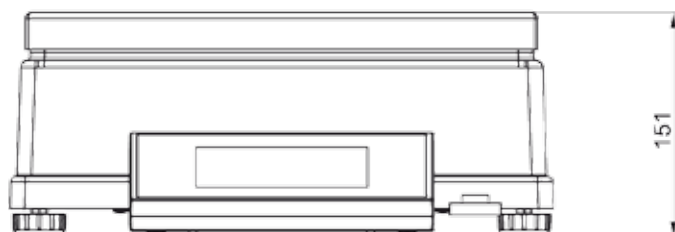
Precise balances of BPP-Y are the response for the growing market demands concerning simple operation & maximum automation of the weighing process.

Measurement reliability & accuracy is assured by internal calibration triggered by time flow or temperature conditions.

Balances equipped in a new electronic modules and are operated using a touch panel covering a 5,7" color graphic display. Scales have implemented new easily operated software.



**Component pan:** flat surface for big loads and openwork pan for reducing indication errors.



Model	BPP-10-Y/Y2	BPP-25-Y/Y2	BPP-35-Y/Y2	BPP-50-Y/Y2
<b>Max capacity</b>	10kg	25kg	35kg	50kg
<b>Readability</b>	0.01g	0.1g	0.1g	0.1g
<b>Tare range</b>	-10kg	-25kg	-35kg	-50kg
<b>Repeatability</b>	0.1g			0.15g
<b>Linearity</b>	±0.02g	±0.1g		±0.5g
<b>Adjustment/Calibration</b>	internal (for Y2 Series) or external (for Y Series)			
<b>Pan size</b>	346 x 258 mm			
<b>Working temperature</b>	+15° - +40°C			
<b>Stabilization time</b>	1.5 s	3 s		
<b>Interface</b>	2×USB, RS 232, Ethernet			
<b>Power supply</b>	110 / 230V AC / 50 / 60Hz / 13.5 / 16V DC / 1.1A			
<b>Calibration weight</b>	10kg			
<b>Display</b>	5.7" touch screen			



**BPP-C Series, Precision Balances**



**BPP-C**

**Optional accessories:**

- Printer
- LCD additional display
- External rechargeable battery pack
- Calibration weight
- Computer software

Precision balances Series BPP-C are offered in two solutions, weighing platform dimensions either 346x258 mm. Depending on the type, balances are equipped with backlit LCD display.

Each Series of BPP-C balances is offered with following capacities: 25, 30 & 6/35 kg. Independently on version, BPP-C balance is based on electromagnetic measuring system, external calibration (internal for scales C2) and RS 232 output.

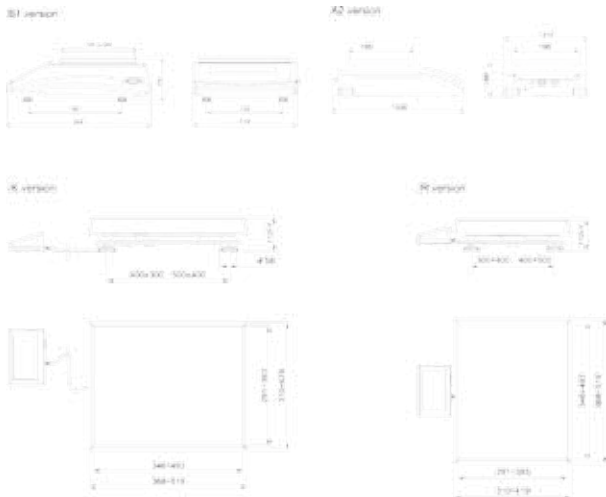
Balance casing is made of aluminum, weighing pan is in stainless steel technology. Balances Series BPP have under hook weighing as standard solution.



Model	BPP-25-C/C2	BPP-35-C/C2	BPP-6-35-C2	BPP-50-C
<b>Max capacity</b>	25kg	35kg	6/35kg	50kg
<b>Readability</b>	0.1g	0.1g	1/5g	0.1g
<b>Tare range</b>	-25kg	-35kg	-35kg	-50kg
<b>Repeatability</b>	0.1g	0.1g	1/5g	0.15g
<b>Linearity</b>	±0.1g	±0.3g	±1/5g	±0.5g
<b>Pan size</b>	346 x 258mm			
<b>Working temperature</b>	+15° - +40°C			
<b>Operation time</b>	3 s			
<b>Interface</b>	RS 232			
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC			
<b>External adjustment/ calibration weight</b>	10kg			
<b>Display</b>	LCD (backlit)			
<b>Net/Gross weight:</b>	<b>BPP-C</b>	14.4/16.4kg		
	<b>BPP-C2</b>	14.8/16.8kg		

\* verified balances

### BWLC Series, Precision Balances



Balances Series BWLC are designed for fast and precise mass determination in laboratory and industrial conditions. They can also be used in areas with no access to mains (230V), as their standard equipment they include internal rechargeable battery and RS 232 output. All kinds of this balance (pan size: 128x128, 125x145, 195x195, 290x360 & 400x500 mm) are equipped with stainless steel weighing platform and backlit LCD display providing good reading of weighing result.

Balances BWLC-A2 have possibility of weighing loads outside weighing platform (so called under hook weighing). where a load is hanged under the instrument. This is an alternative for weighing loads with non-standard dimensions and shapes. This means of weighing is also useful for determination of density of solids and liquids with application of standard functions of the balance.

#### Optional accessories:

- Printer
- Rack for under hook weighing
- Suitcase for balance
- Computer software



Model	BWLC-0.6-B1*	BWLC-1-A2	BWLC-2-A2	BWLC-3-6-A2*	BWLC-6-A2*	BWLC-6-12-A2*	BWLC-10-A2	BWLC-20-A2
Max capacity	0.6kg	1kg	2kg	3/6kg	6kg	6/12kg	10kg	20kg
Readability	0.01g	0.01g	0.01g	0.05/0.1g	0.1g	0.1/0.2g	0.1g	0.1g
Tare range	-0.6kg	-1kg	-2kg	-6kg	-6kg	-12kg	-10kg	-20kg
Linearity	±0.01g	±0.03g	±0.03g	±0.05/0.1g	±0.2g	±0.1/0.2g	±0.2g	±0.2g
Repeatability	0.01g	0.03g	0.03g	0.05/0.1g	0.2g	0.1/0.2g	0.2g	0.2g
Pan size	125x145mm	195x195mm						
Stabilization time	3 s							
Working temp.	+15° - +30°C							
Power supply	230V / 11V AC or 120V / 11V AC, (Rechargeable battery)							
IP rating	IP 43							
Display	LCD (backlit)							

Model	BWLC-6-C1R* BWLC-6-C1K*	BWLC-6-12-C1R* BWLC-6-12-C1K*	BWLC-12-C1R BWLC-12-C1K	BWLC-12-30-C1R BWLC-12-30-C1K	BWLC-30-C1R BWLC-30-C1K	BWLC-60-C2R* BWLC-60-C2K*	BWLC-60-120-C2R* BWLC-60-120-C2K*	
Max capacity	6kg	6/12kg	12kg	12/30kg	30kg	60kg	60/120kg	
Readability	0.1g	0.1/0.2g	0.2g	0.2/0.5g	0.5g	1g	1/2g	
Tare range	-6kg	-12kg	-12kg	-30kg	-30kg	-60kg	-120kg	
Linearity	±0.3g	±0.1/0.2g	±0.6g	±0.2/0.5g	±1.5g	±3g	±1/2g	
Repeatability	0.3g	0.1/0.2g	0.6g	0.2/0.5g	1.5g	3g	1/2g	
Pan size	300x300mm				400x500mm			
Stabilization time	3 s							
Working temp.	+15° - +30°C							
Power supply	230V / 11V AC or 120V / 11V AC, and accumulator							
IP rating	IP 43							
Display	LCD (backlit)							

\* verified balances

**BWLC-C2 Series, Precision Balances**



**BWLC-C2**

A1 version



A2 version



Balances Series BWLC-C2 are designed for fast and precise mass determination in laboratory and industrial conditions. They can also be used in areas with no access to mains (230V), as their standard equipment they include internal rechargeable battery and RS 232 output. All kinds of this balance (pan size: 128x128, and 195x195 mm) are equipped with stainless steel weighing platform & backlit LCD display providing good reading of weighing result.

Balances have possibility of weighing loads outside weighing platform (so called under hook weighing) where a load is hunged under the instrument. This is an alternative for weighing loads with non-standard dimensions and shapes. This means of weighing is also useful for determination of density of solids and liquids with application of standard functions of the balance.



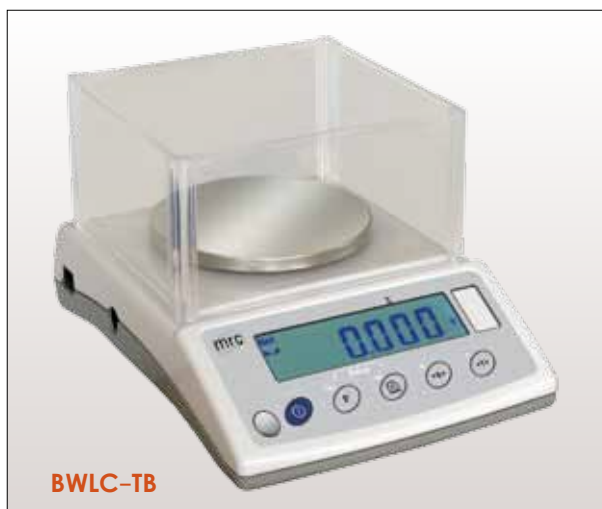
**Optional accessories:**

- Printers
- PC keyboard
- Foot button for tare or print functions
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software

Model	BWLC-0.6-A1-C2*	BWLC-1-A2-C2	BWLC-1.2-A2-C2	BWLC-3-A2-C2	BWLC-6-A2-C2*
<b>Max capacity</b>	0.6kg	1kg	1.2kg	3/6kg	6kg
<b>Readability</b>	0.01g	0.01g	0.02g	0.05g	0.1g
<b>Tare range</b>	-0.6kg	-1kg	-3kg	-6kg	-6kg
<b>Repeatability</b>	0.02g	0.03g	0.02g	0.05g	0.2g
<b>Linearity</b>	±0.2g	±0.03g	±0.02g	±0.05g	±0.2g
<b>Pan size</b>	128 x 128mm		195 x 195mm		
<b>Interface</b>	RS 232				
<b>Working temp.</b>	+15° - +30°C				
<b>Stabilization time</b>	3 s				
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC, (accumulator)				
<b>Calibration</b>	internal (automatic)				
<b>IP rating</b>	IP 43				
<b>Display</b>	LCD (backlit)				
<b>Net/Gross weight</b>	1.2 / 2kg		3 / 4kg		
<b>Packaging size</b>	320x210x150mm		320x210x150mm		

\* verified balances

### BWLC-TB Series, Precision Balances



BWLC-TB

BWLC-TB balances are designed for fast and precise determination of mass in laboratory conditions.

They can be used in locations where no power (230V) is accessible as they are equipped with internal rechargeable battery.

Balances are equipped with stainless steel weighing pan, RS 232 output and backlit LCD display.



Counting pieces



Animal weighing



Checkweighing



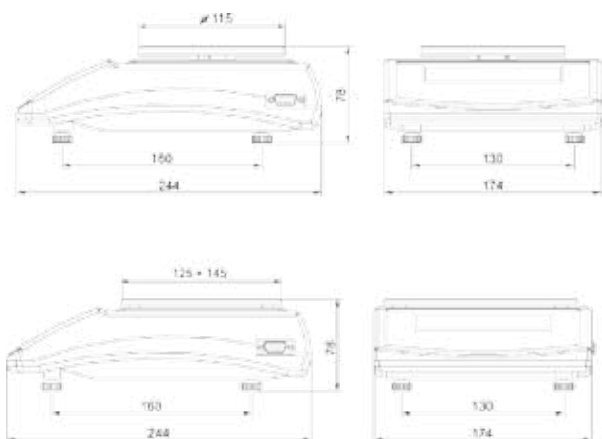
Percentage



Summing function



Caps lock of max indication



#### Optional accessories:

- Printers
- Rack for head
- LCD additional display
- Table for scale
- External rechargeable battery pack
- Computer software
- RS 232/RS 485 Converter
- External power output

Model	BWLC-200-TB	BWLC-2000-TB
Max capacity	200g	2000g
Readability	0.001g	0.01g
Tare range	-200g	-2000g
Repeatability	0.003g	0.03g
Linearity	±0.003g	±0.03g
Pan size	Ø115 mm	125 x 145 mm
Working temperature	+15° - +30°C	
Power supply	230V / 11V AC or 120V / 11V AC, & 6 AA NiMH accumulator	
IP rating	IP 43	
Display	LCD (backlit)	
Net / Gross weight	1.1/2kg	
Packaging size	320x210x150mm	

**BWPT-F Series, Table Scales**



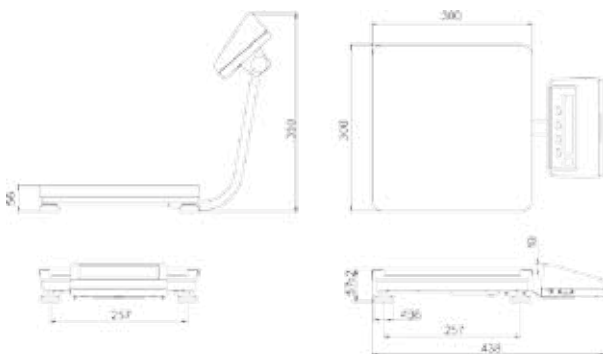
Table scales Series BWPT-F are designed for fast and precise mass determination. Tarring in the whole measuring range allows to determine Nett Mass of the weighed loads.

Scales feature low-profiled esthetic construction with Type-31 measuring indicator equipped with backlit, LCD display. Their standard equipment includes one RS 232 interface, internal rechargeable NiMH accumulators, and a power adapter. Scales Series/F can be made with a measuring indicator on a pillar, cable or fixed to the construction.

Table scales Series BWPT-F can cooperate with PC software, which contains the essential information on weighing indicated on the display. It also allows editing & modifying all the user parameters from the level of PC.

Optionally, the scales have possibility of weighing loads outside the weighing platform (so called under hook weighing). It is an alternative, for the loads with non-standard dimensions, shapes or emitting electromagnetic field.

Extra equipment comprises additional display. It is used for controlling mass of the weighed load by third party.



**Optional accessories:**

- Rack for head
- LCD additional display
- Large size additional display
- Printer
- Table for scale
- External power output
- Computer software
- RS 232/RS 485 converter
- RS 232 cables

Model	BWPT-F3C BWPT-F3C-K BWPT-F3C-R	BWPT-F3-6C BWPT-F3-6C-K BWPT-F3-6C-R	BWPT-F6C BWPT-F6C-K BWPT-F6C-R	BWPT-F6-15C BWPT-F6-15C-K BWPT-F6-15C-R	BWPT-F15C BWPT-F15C-K BWPT-F15C-R	BWPT-F15-30C BWPT-F15-30C-K BWPT-F15-30C-R	BWPT-F30C BWPT-F30C-K BWPT-F30C-R
<b>Max. capacity</b>	3kg	3/6kg	6kg	6/15kg	15kg	15/30kg	30kg
<b>Readability</b>	1g	1/2g	2g	2/5g	5g	5/10g	10g
<b>Tare range</b>	-3kg	-6kg	-6kg	-15kg	-15kg	-30kg	-30kg
<b>Pan size</b>	300x300mm						
<b>Working temp.</b>	-10° - +40°C						
<b>Output signal</b>	RS 232						
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC and 6 x AA NiMH accumulator						
<b>Display</b>	LCD (backlit)						
<b>Mass</b>	5.5kg						

### BWTC Series, Platform Scales with Plastic Head



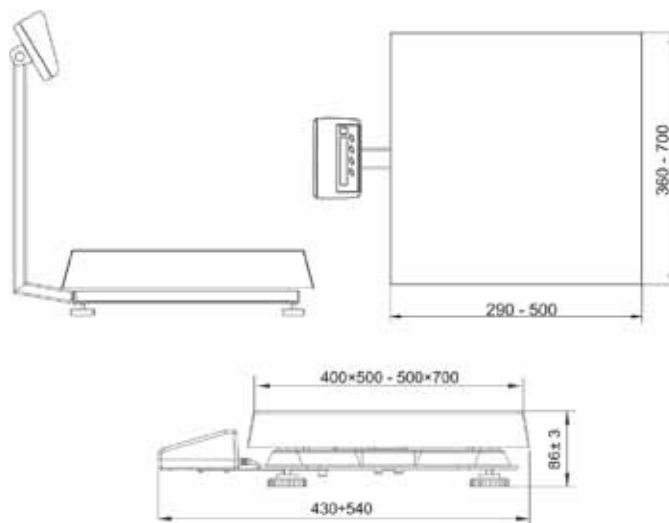
Ramp scales are designed for direct trading and in those applications, where fast & precise determination of net mass is necessary.

They are equipped with measuring indicator Series Type-31 with backlit LCD display installation:

- a pillar with possibility of adjusting the angle (BWTC version);
- a cable (version BWTC-K);
- at the platform (version BWTC-R).

Scale is manufactured in mild steel, stainless steel weighing pan.

Scales are equipped with two power supply options: mains or batteries (6 x AA).



#### Optional accessories:

- Rack for head
- LCD additional display
- Printer
- Table for scale
- External rechargeable battery pack
- Computer software
- RS 232/RS 485 converter
- External power output

Model	BWTC-3-C1R	BWTC-6-C1 BWTC-6-C1K BWTC-6-C1R	BWTC-15-C1 BWTC-15-C1K BWTC-15-C1R	BWTC-30-C1 BWTC-30-C1K BWTC-30-C1R	BWTC-60-C2 BWTC-60-C2K BWTC-60-C2R	BWTC-150-C2 BWTC-150-C2K BWTC-150-C2R	BWTC-300-C2	BWTC-150-C3	BWTC-300-C3
	<b>Max. capacity</b>	3kg	6kg	15kg	30kg	60kg	150kg	300kg	150kg
<b>Readability</b>	1g	2g	5g	10g	20g	50g	100g	50g	100g
<b>Tare range</b>	-3kg	-6kg	-15kg	-30kg	-60kg	-150kg	-300kg	-150kg	-300kg
<b>Pan size (mm)</b>	300x300	300x300	300x300	300x300	400x500	400x500	400x500	500x700	500x700
<b>Working temp.</b>	-10° - +40°C								
<b>Output signal</b>	RS 232								
<b>IP rating</b>	IP 65 construction, IP 43 indicator								
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC and 6 x AA NiMH accumulator								
<b>Display</b>	LCD (backlit)								
<b>Net/Gross W</b>	6.5/7.8kg			15.5/17.8kg			20.5/26.8kg		

**BPS-CT Series, Jewelry Balances**



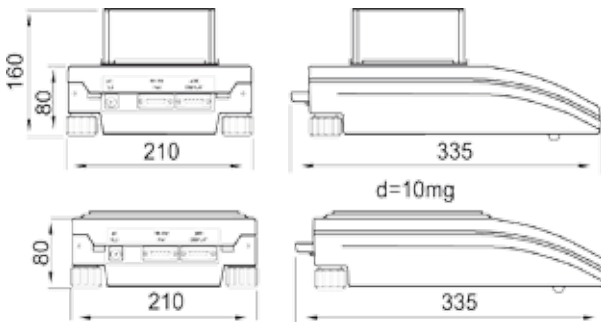
Jewelry balances Series BPS are equipped with backlit LCD display and weighing pan 128x128 mm with glass draught shield and readability 1 mg.

Second group of jewelry balances has weighing pan 195x195 mm and readability 10mg.

GLP procedure of these balances is a report from calibration process of the balance, and this information has unchangeable shape. Each balance is equipped with RS 232 output.



Balances are equipped with possibility of weighing loads outside the main weighing platform (so called under hook weighing). This means of mass measuring is an alternative for loads with non-standard dimensions & shapes and those which create magnetic field. Under hook weighing is also applied for density determination procedures.



**Optional accessories:**

- Anti-vibration table
- Printer
- Density determination kit for solids and liquids
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software

Model	BPS-510-C1-CT* BPS-510-C2-CT	BPS-2100-C1-CT* BPS-2100-C2-CT
<b>Max capacity</b>	510g/2550ct	2100g/10500ct
<b>Minimal load</b>	0.02g/0.1ct	0.5g/2.5ct
<b>Readability</b>	0.001g/0.005ct	0.01g/0.05ct
<b>Tare range</b>	-510g/-2550ct	-2100g/-10500ct
<b>Repeatability</b>	0.001g/0.005ct	0.01g/0.05ct
<b>Linearity</b>	±0.001g/0.005ct	±0.01g/0.05ct
<b>Pan size</b>	128 x 128 mm	195 x 195 mm
<b>Sensitivity drift</b>	2 ppm/°C in temperature +15 - +35°C	
<b>Stabilization time</b>	2 s	1.5 s
<b>Working temperature</b>	+15° - +30°C	
<b>Interface</b>	RS 232	
<b>Power supply</b>	110 / 230V AC / 50 / 60Hz / 13.5 / 16V DC / 1.1A	
<b>Adjustment / Calibration</b>	internal (for C2 version) or external (for C1 version)	
<b>Display</b>	LCD (backlit)	
<b>Net / gross weight</b>	<b>C1</b>	3.2 / 5.1kg
	<b>C2</b>	3.7 / 5.6kg
		3.4 / 5.3kg
		4.6 / 6.5kg

\* Calibration needs to be carried out on site, due to influence of gravity acceleration

### ASB-CT Series, Jewelry-Diamond Balances

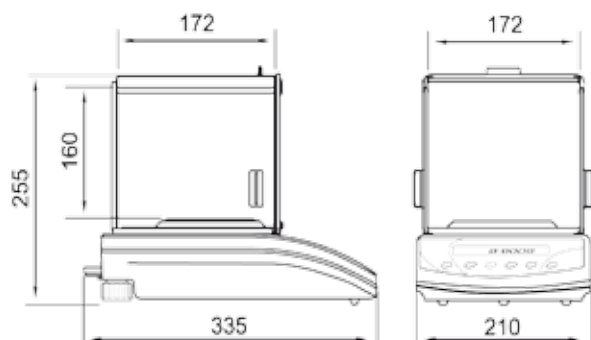


ASB-CT

Analytical balances ASB Series are offered with following capacities: 140 g, 220 g and 320 g with readability of 0,2 mg.

They are equipped with anti breeze draught shield with sliding glass doors and backlit LCD display.

These balances have system of internal automatic calibration (C2 version) activated on time & temperature changes. Balances are equipped with possibility of weighing loads outside the main weighing platform (so called under hook weighing). This means of mass measuring is an alternative for loads with non-standard dimensions & shapes and those which create magnetic field. Under hook weighing is also applied for density determination procedures.



#### Optional accessories:

- Anti-vibration table
- Printer
- Density determination kit for solids and liquids
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery pack
- Suitcase for balance
- Computer software

Model	ASB-120-C2CT*	ASB-220-C2CT*	ASB-320-C2CT
<b>Max capacity</b>	120g/600ct	220g/1100ct	320g/1600ct
<b>Minimal load</b>	0.004g/0.02ct	0.004g/0.02ct	0.004g/0.02ct
<b>Readability</b>	0.0002g/0.001ct	0.0002g/0.001ct	0.0002g/0.001ct
<b>Tare range</b>	-120g/-600ct	-220g/-1100ct	-320g/-1600ct
<b>Repeatability</b>	0.0002g/0.001ct	0.0002g/0.001ct	0.0004g/0.002ct
<b>Linearity</b>	±0.0002g/0.001ct	±0.0002g/0.001ct	±0.0004g/0.002ct
<b>Pan size</b>	Ø85mm		
<b>Sensitivity drift</b>	2 ppm/°C in temperature +15 - +35°C		
<b>Working temperature</b>	+15° - +30°C		
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC		
<b>Calibration</b>	internal (C2 version) or external (C1 version)		

\* verified balances



**BPS-XG Series, Balances for Cereals Density**

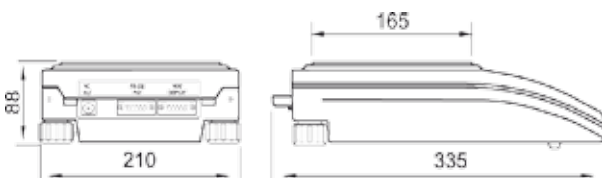


**BPS-XG**

density measuring devices for grains). Density determination can be performed for following grains: wheat, oats, barley, rye.

Balance, as a precise measuring device is equipped with control procedures complying with ISO/GLP, memory with high capacity (reduction tables for grains), possibility of cooperation with printer or computer. Advantages of balances Series BPS-X are possibility of generation of GLP procedures Balances are equipped with RS 232, PS/2 output and possibility of connection of additional display as standard.

Scales have possibility of weighing loads under the weighing pan, i.e. under-hook weighing. In such case the mass of load is measured under the pan. It is an alternative for loads with non-standard dimensions, shapes and loads which create magnetic field. Under-hook weighing is also applied for density determination of materials.



BPS-XG balances is designed for density determination of grains. They are equipped with system of automatic internal calibration, 195x195 mm weighing pan and big backlit graphic display with extended user menu.

The density determination of grains in loose form is performer with application of precision balance Series BPS-X4500G and a density measuring device of 1L volume. The density is calculated automatically by the software of balance (in accordance to tables for



**Optional accessories:**

- Density determination kit for grains
- Anti-vibration table (mild steel or stainless steel)
- Printers
- PC keyboard
- Foot button for tare or print functions
- Rack for under hook weighing
- LCD additional display
- External rechargeable battery with charger
- Suitcase for balance
- Computer software

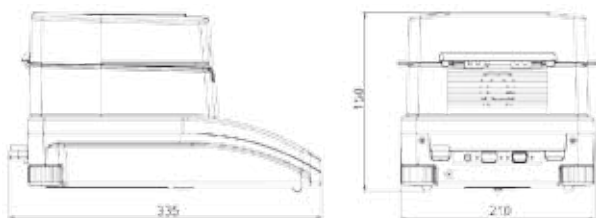


Model	BPS-X4500G
<b>Max capacity</b>	4500g
<b>Minimal load</b>	0.5g
<b>Readability</b>	0.01g
<b>Tare range</b>	-4500g
<b>Repeatability</b>	0.02g
<b>Linearity</b>	±0.02g
<b>Pan size</b>	195 x 195 mm
<b>Working temperature</b>	+15° - +30°C
<b>Interface</b>	RS 232
<b>Power supply</b>	110 / 230V AC / 50 / 60Hz / 13,5 / 16V DC / 1.1A
<b>Adjustment / Calibration</b>	Internal (automatic)
<b>Display</b>	Graphic (backlit)
<b>Net / Gross weight</b>	4.8 / 6.7kg

### MB-Series, Moisture Analyzers



MB-Series



#### Optional accessories:

- Anti-vibration table
- Printer
- PC keyboard
- Disposable pans
- Control thermometer
- Calibration weight
- Computer software

Moisture analyzers are measuring devices specially designed for determination of moisture content of relatively small samples of various materials.

Moisture analyzer MB enables:

- easy access due to backlit LCD display
- drying profile (standard, mild, step, rapid).
- finish mode (manual, humidity stabilization, automatic, time defined).
- GLP/GMP printouts and reports
- halogen or infrared lamps
- standard and non-standard applications
- optimization of work due to halogen lamps mode

Maximal capacity of moisture analyzer Series MB is 210 g / 1 mg.

Moisture content is measured with accuracy 0,01% (0,001% for samples up to 1.5g).

Maximal drying temp. equals 160°C (an extra cost option is moisture analyzer for drying with temp. 250°C).



Model	MB-50-1-xx/IR/250/M	MB-50-xx/IR/M	MB-110-xx/IR/250/M	MB-210-xx/IR/250/M
<b>Max capacity</b>	50g	50g	110g	210g
<b>Reading unit</b>	0.1mg	1mg	1mg	1mg
<b>Tare range</b>	-50g	-50g	-110g	-210g
<b>Max mass of sampling</b>	50g	50g	110g	210g
<b>Accuracy of moisture reading</b>	0.0001%	0.001%	0.001%	0.001%
<b>Moisture readout repeatability</b>	+/-0,24% (sample < 2g), +/-0,06% (sample 2-10g), +/- 0,04% (sample >10g)			
<b>Max. height of the tested sample</b>	h= 20mm			
<b>Drying chamber dimensions</b>	120x120x20mm			
<b>Pan size</b>	Ø90mm, h= 8mm			
<b>Range of drying temperature</b>	max. 160° C (XX, IR and M version), max. 250° C (250 version)			
<b>Heating module</b>	halogen (XX & 250 version), IR emitter (IR version), a heater in metal housing (M version)			
<b>Drying modes</b>	4 drying modes (standard, quick, stepped, mild)			
<b>Auto switch off options</b>	3 modes (manual, automatic, time defined)			
<b>Additional functions</b>	sample identification			
<b>Power of heating device</b>	400W			
<b>Working temperature</b>	+15° - +40°C			
<b>Power supply</b>	230V AC or 120V AC			
<b>Display</b>	LCD (backlit)			
<b>Net / Gross weight</b>	4.9 / 7kg			
<b>Packaging size</b>	520x390x435mm			

Note: Standard delivery **xx** - halogen, max. 160° C **250** - halogen, max. 250° C **IR** - IR emitter, max. 160° C **M** - Metal, max. 160°C food industry

## MBP-Series, Moisture Analyzers



MBP-Series

Moisture analyzers are measuring devices specially designed for determination of moisture content of relatively small samples of various materials.

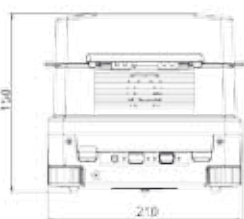
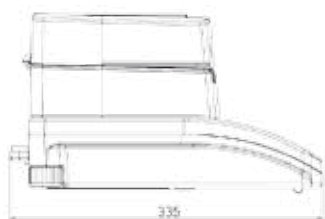
Moisture analyzer MBP is equipped with backlit graphic display, due to which the user interface is clear and easy to use. User menu includes data base with 99 drying procedures, where each entry has its programmed name (for instance material name, its number, ID, etc).

Moisture analyzer MBP enables:

- easy access due to backlit graphic display
- standard and non-standard applications
- available languages Polish, English, German, French, Spanish, Russian, Czech
- communication with usage of PC KEYBOARD
- data base with 99 drying procedures
- drying profile (standard, mild, step, rapid)
- finish mode (manual, automatic, time defined)
- visualization of drying process
- GLP/GMP printouts & reports
- halogen or infrared lamps.



Maximal capacity of moisture analyzer Series MBP is 210g /1mg. Moisture content is measured with accuracy 0,01% (0,001% for samples up to 1,5g). Maximal drying temp. equals 160°C (an extra cost option is moisture analyzer for drying with temp. 250°C).



## Optional accessories:

- Anti-vibration table
- Printer
- PC keyboard
- Disposable pans
- Control thermometer
- Calibration weight
- Computer software

Model	MBP-50-1-xx/250/IR	MBP-50-xx/250/IR	MBP-60-xx/250/IR
Max capacity	50g	50g	60g
Reading unit	0.1mg	1mg	1mg
Tare range	-50g	-50g	-60g
Max mass of sampling	50g	50g	60g
Accuracy of moisture reading	0.0001%	0.001%	0.001%
Repeatability of moisture readout	+/-0.1% (sample < 2g), +/-0.02% (sample 2-10g), +/-0.04% (sample > 10g)		
Maximal height of the tested sample	h= 20mm		
Drying chamber dimensions	120x120x20 mm		
Pan size	Ø90mm, h= 8mm		
Range of drying temperature	max. 160° C (xx and IR version), max. 250° C (250 version)		
Heating module	halogen (xx and 250 version), IR emitter (IR version)		
Drying modes	4 drying modes (standard, quick, stepped, mild)		
Auto switch off options	3 modes (manual, automatic, time defined)		
Additional functions	sample identification, drying diagram		
Power of heating device	400W		
Working temperature	+15° - +40°C		
Power supply	110/240V AC, 50 / 60 Hz		
Display	Graphic (backlit)		
Net / Gross weight	5.1/7.2kg		
Packaging size	520x390x435mm		

xx - halogen, max. 160° C    250 - halogen, max. 250° C    IR - IR emitter max. 160° C

### WPY Series, Industrial Scales



WPY

### Separable Indicator

The possibility of detach the indicator from the weighing chamber significantly limits shocks and vibrations that are moved on the weighing chamber, increases the ergonomics of operation



### Data exchange through USB storage devices

- Updating balance software
- Exporting weighing data
- Exporting/importing databases
- Exporting/importing balance settings
- Exchanging data between balances

Scales Series WPY are designed for fast and precise mass determination with special designation for use in direct trade.

Balances equipped in a new electronic modules and are operated using a touch panel covering a 5.7" color graphic display. Y scales have implemented new easily operated software.

Dual range version for WPY scale:

- 195×195mm: 0.6-1.5-D2, 1.5-3-D2, 3-6-D2, 6-15-D2.
- 290×360 mm: 3-6-C1R, 6-15-C1R, 15-30-C1R, 3-6-C1K, 6-15-C1K, 15-30-C1K.
- 400×500 mm: 30-60-C2R, 60-150-C2R, 30-60-C2K, 60-150-C2K, 150-300-C2K.
- 500×700 mm: 60-150-C3K, 150-300-C3K.

### Optional accessories:

- Printers
- PC keyboard
- Rack for under hook weighing
- LCD Display
- Calibration weight
- Standard mass
- Density determination kit
- Power adapter with battery & charger
- Suitcase for balance
- Computer software
- RS 232 Cables



Counting pieces



Filling



Animal weighing



Density determination



Checkweighing



Percentage



Statistics



Under-Hook Weighing



Formulation



Infrared Sensors



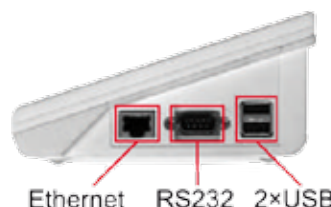
Labelling



### Infrared proximity sensors

- PRINT function
- TARE function
- Opening weighing chambers
- Sensors' sensitivity adjustment

### Communication interfaces

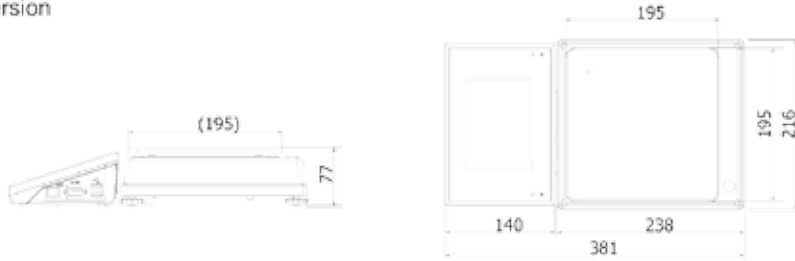


Ethernet RS232 2×USB

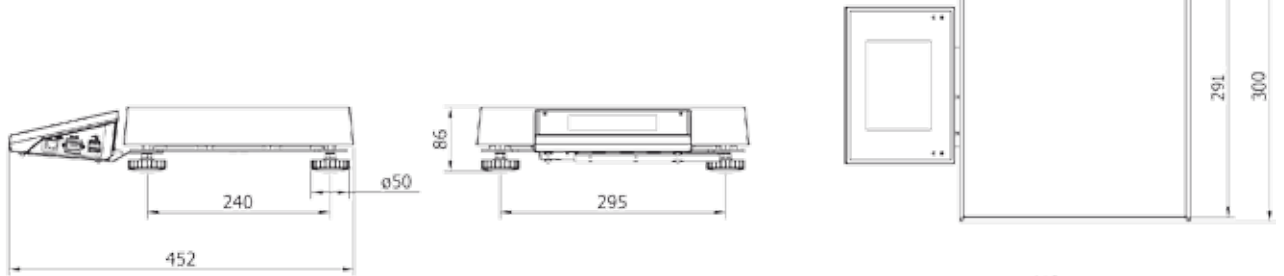


additional display

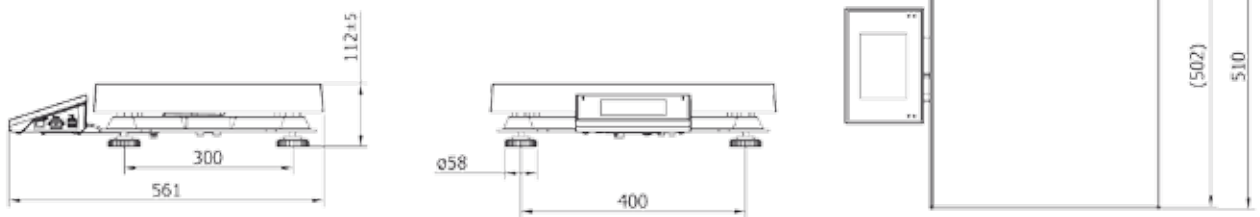
D2 version



C1 version



C2 version



Model	WPY-1.5-D2	WPY-3-D2	WPY-6-D2	WPY-15-D2
<b>Max capacity</b>	1.5kg	3kg	6kg	15kg
<b>Readability</b>	0,5g	1g	2g	5g
<b>Tare range</b>	-1.5kg	-3kg	-6kg	-15kg
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC			
<b>Calibration</b>	external			
<b>Pan size</b>	195x195 mm			
<b>Interface</b>	2xUSB, RS 232, Ethernet, 4in / 4out			
<b>Display</b>	5,7'' touch screen			

Model	WPY-6-C1R WPY-6-C1K	WPY-15-C1R WPY-15-C1K	WPY-30-C1R WPY-30-C1K	WPY-60-C2R WPY-60-C2K	WPY-150-C2R WPY-150-C2K	WPY-300-C2K	WPY-150-C3K	WPY-300-C3K
<b>Max capacity</b>	6kg	15kg	30kg	60kg	150kg	300kg	150kg	300kg
<b>Readability</b>	2g	5g	10g	20g	50g	100g	50g	100g
<b>Tare range</b>	-6kg	-15kg	-30kg	-60kg	-150kg	-300kg	-150kg	-300kg
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC							
<b>Calibration</b>	external							
<b>Pan size (mm)</b>	300x300	300x300	300x300	400x500	400x500	400x500	500x700	500x700
<b>Interface</b>	2xUSB, RS 232, Ethernet, 4in / 4out							
<b>Display</b>	5.7'' touch screen							

### WPT Series, Waterproof Platform Scales



Waterproof platform scales are designed for operation in environment with high humidity and in direct contact with water. They are equipped with measuring indicator Series Type-31H with backlit LCD indicator and IP rating 68. Indicator is installed on a pillar attached to the weighing platform, optionally, the indicator can be connected to the platform by 3 meter long cable; in this solution it is possible to hang the indicator on wall.

Scale is manufactured in stainless steel technology type OH18N9.



Waterproof scales are equipped with 100% waterproof protection of load cell. this construction secures load cells against the influence of external factors.

Model	WPT-6-H2 WPT-6-H2K	WPT-15-H2 WPT-15-H2K	WPT-15-H3 WPT-15-H3K	WPT-30-H3 WPT-30-H3K	WPT-60-H3 WPT-60-H3K	WPT-150-H3 WPT-150-H3K
<b>Max capacity</b>	6kg	15kg	15kg	30kg	60kg	150kg
<b>Readability</b>	2g	5g	5g	10g	20g	50g
<b>Tare range</b>	-6kg	-15kg	-15kg	-30kg	-	-
<b>Pan size</b>	250x300mm	250x300mm	410x410mm	410x410mm	410x410mm	410x410mm
<b>Working temp.</b>	-10° - +40°C					
<b>Output signal</b>	RS 232					
<b>IP rating</b>	IP 66/67					
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC and internal accumulator					
<b>Display</b>	LCD					
<b>Net / Gross W</b>	9/10.3Kg	9/10.3Kg	15.5/17.3Kg	15.5/17.3Kg	15.5/17.3Kg	15.5/17.3Kg

Model	WPT-60-H4 WPT-60-H4K	WPT-150-H4 WPT-150-H4K	WPT-60-H5 WPT-60-H5K	WPT-150-H5 WPT-150-H5K	WPT-300-H5 WPT-300-H5K	WPT-150-H6 WPT-150-H6K	WPT-300-H6 WPT-300-H6K
<b>Max capacity</b>	60kg	150kg	60kg	150kg	300kg	150kg	300kg
<b>Readability</b>	20g	50g	20g	50g	100g	50g	100g
<b>Tare range</b>	-60kg	-150kg	-60kg	-150kg	-300kg	-150kg	-300kg
<b>Pan size</b>	500x500mm	500x500mm	600x600mm	600x600mm	600x600mm	800x800mm	800x800mm
<b>Working temp.</b>	-10° - +40°C						
<b>Output signal</b>	RS 232						
<b>IP rating</b>	IP 66/67						
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC and internal accumulator						
<b>Display</b>	LCD						
<b>Net / Gross W</b>	23.5/25.8Kg		29.5Kg/31.8Kg			42.5Kg/45.8Kg	

**WPT Series, Waterproof Platform Scales**



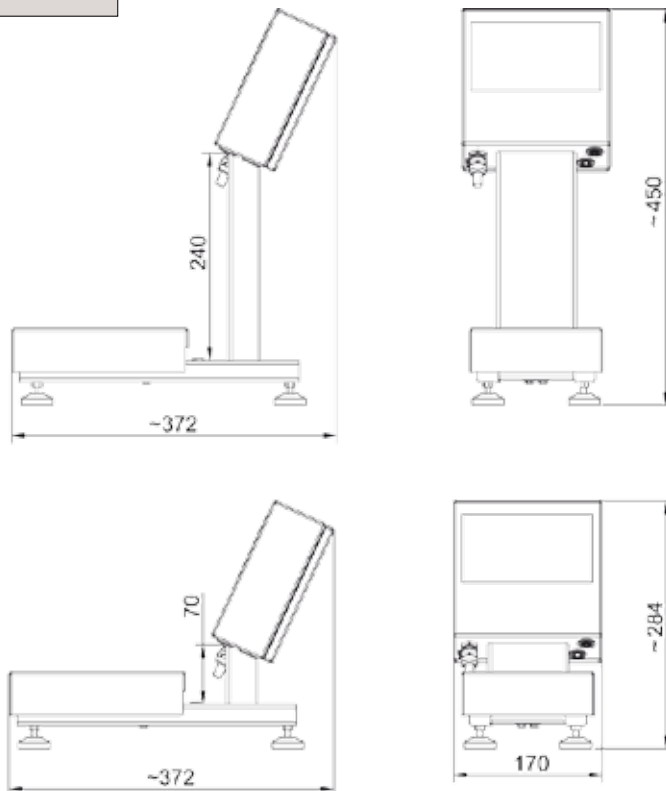
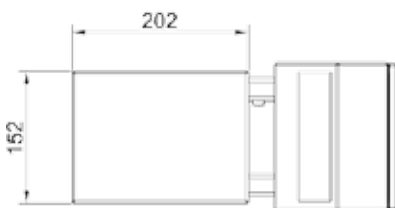
Capacity range for our waterproof platform scales ranges from 3kg /1g to 300kg/100g. Power supply from mains, RS 232 output is offered as standard equipment of the scale.

Optionally, for additional charge it is possible to manufacture stainless steel waterproof scales with upgraded protection against corrosion.

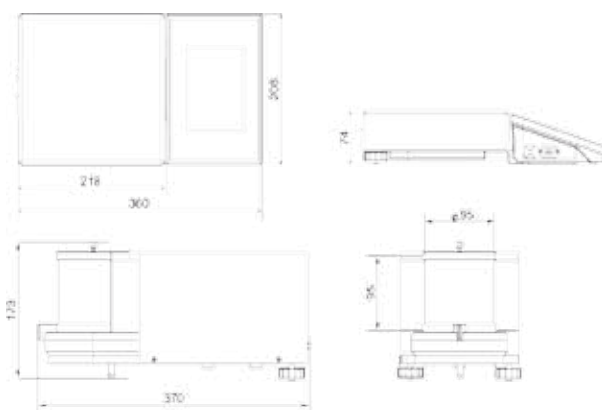


**Optional accessories:**

- Rack for Head
- Handle to steel head to mount it to wall/table
- LCD Display
- Large size display
- Printers
- Table for scale
- Roll cover
- Computer software
- RS 232/RS 485 Converter
- External power output

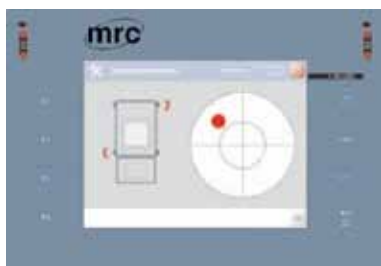


Model	WPT-3-H1 WPT-3-H1K
<b>Max capacity</b>	3kg
<b>Readability</b>	1g
<b>Tare range</b>	-3kg
<b>Pan size</b>	200x150mm
<b>Working temp.</b>	-10° - +40°C
<b>Output signal</b>	RS 232
<b>IP rating</b>	IP 66/67
<b>Power supply</b>	230V / 11V AC or 120V / 11V AC and internal accumulator
<b>Display</b>	LCD
<b>Net / Gross weight</b>	7/8.3kg



Comparator is in high degree influenced by external conditions like temperature, breeze & vibrations. For the purpose of proper operation conditions, it is necessary to use the comparator in a room with very precise temperature control (laminar air-conditioning) and place of usage should be free from any vibrations.

Comparators do not undergo Legal Metrological Control. Main criterion if evaluation is repeatability. The software is equipped with application for estimating average deviation by two methods: ABA or ABBA, for maximally 20 repetitions. After running the procedure, the software generates the report with results.



#### Electronic level indicator

- ALARM function
- Graphic level indicator
- Programmable acceptable tilts

Mass comparators are devices designed for determining the differences between masses of calibration weight (B) and reference weight (A).

Comparators are most often used in measuring laboratories for calibration of weights and masses.

MRC offers comparators designed for calibration of weights and masses class E1, E2, F1, F2, M1 according to OIML R111, with masses from 1mg to 20g with readability 1  $\mu$ g.

Comparator MGB-21KO consists of two components.

One of them holds the electronic module, and the other precise mechanical measuring system. Such solution guarantees elimination of temperature influence (warming of electronic elements) on the indications of comparator.

Comparator is equipped with big graphic display with user friendly menu. In order to guarantee proper accuracy of measurements, a half-automatic system of external calibration with calibration weight has been applied.

Comparator is equipped with esthetic, cylindrical shaped weighing chamber with glass draught shield.

All elements of the weighing chamber are manufactured from glass or metal which minimizes the influence of electrostatic charges on weighing result.

Comparator is equipped with user friendly menu.

The software allows for composition of GLP procedures as standard printout or as freely definable non-standard printout. Each comparator is equipped with Ethernet, RS 232, 2xUSB & possibility of connecting additional display as standard.



#### Data exchange through USB storage devices

- Updating balance software
- Exporting weighing data
- Exporting/importing databases
- Exporting/importing balance settings
- Exchanging data between balances

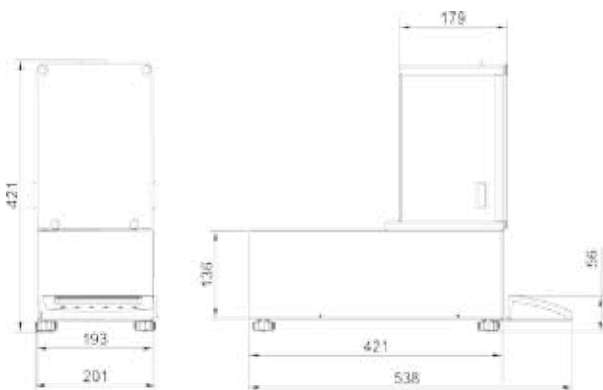
Model	MGB-21KO
Maximal capacity	21g
Readability	1 $\mu$ g
Range of electromagnetic compensation	0...21g
Repeatability	1 $\mu$ g (for Max 20mg), 3 $\mu$ g (for Max=20mg-5g), 5 $\mu$ g (for Max=5g-20g)
Stabilization time	10...20 s
Calibration	internal
Pan size	Ø14mm
Weighing chamber dimensions	Ø90x90mm
Calibration range according to OIML R111	100mg-20mg (E1), 1mg-200g (E2 - M1)
Working temperature	+15 - +35°C
Change rate of working temperatures	±0.5°C/12h
Humidity	40 - 70%



WAX-KO, Medical Mass Comparators



Mass comparators are devices designed for determining the differences between masses of calibration weight (B) and reference weight (A). Comparators are most often used in measuring laboratories for calibration of weights and masses. We offers comparators designed for calibration of weights and masses class E1, E2, F1, F2, M1 according to OIML R111, ranging from 100g to 5000g with readability from 0.01mg to 1mg. Main part of the comparator is precise mechanical measuring system which is separated from electronic circuits. Such solution guarantees elimination of temp. influence (warming of electronic elements) on the indications of comparator. Comparator is equipped with big graphic backlit display with user friendly menu in Polish and English language In order to guarantee proper accuracy of measurements, a half-automatic system of external calibration with calibration weight has been applied. Comparator is equipped with esthetic weighing chamber with glass anti-draught protection. All elements of the weighing chamber are manufactured from glass or metal which minimizes the influence of electrostatic charges on weighing result. Comparator is equipped with user friendly menu. The software allows for composition of GLP procedures as standard printout or as freely definable non-standard printout. Each comparator is equipped with RS 232, PS/2 output and possibility of connecting additional display as standard.



Comparator is in high degree influenced by external conditions like temperature, breeze and vibrations. For the purpose of proper operation conditions, it is necessary to use the comparator in a room with very precise temperature control (laminar air-conditioning) and place of usage should be free from any vibrations. Comparators do not undergo Legal Metrological Control. Main criterion if evaluation is repeatability. The software is equipped with application for estimating average deviation by two methods: ABA or ABBA, for maximally 20 repetitions. After running the procedure, the software generates the report with results.

Model	WAX-210KO	WAX-510KO	WAX-2100KO	WAX-5100KO
Maximal capacity	210g	510g	2100g	5100g
Readability	0.01mg	0.1mg	0.1mg	1mg
Range of electromagnetic compensation	190-210g	480-510g	0...2100g	0...5100g
Repeatability	0.01mg	0.1mg	0.1mg	0.5mg
Stabilization time	10s	10s	2...10 s	2...10 s
Calibration	external			
Pan size	Ø28mm	Ø37.8mm	Ø85mm	Ø120mm
Weighing chamber dimensions (mm)	160x172x210	230x172x210	230x172x210	230x172x210
Calibration range according to OIML R111	50g-200g (E1) 50g-200g (E2-M3)	500g (E1) 200g-500g (E2) 50-500g (F1-M2)	1kg-2kg (E1) 500g-2kg (E2-M2)	5kg (E1) 1kg-5kg (E2-M1)
Working temperature	+15 - +30°C			
Change rate of working temperatures	±0.5°C/12h			
Humidity	40 - 70%			
Weight	14kg			

**BPP-Y Series, Medical Mass Comparator****BPP-Y**

Mass comparators are devices specially designed for determining the differences between the weight of checked standard mass (B) & weight of reference standard mass (A). Mass comparators are most often applicable in measuring laboratories, where calibration of weights and standard masses is performed. We include in its offer mass comparators for calibration of weights & standard masses classes: F2, M1 according to OIML R111, ranging from 5kg to 20kg with readability 10mg. Mass comparator Series BPP-Y is a compact housing with precise measuring set. Mass comparator Series BPP-Y is equipped with big, backlit, graphic display, and user menu operating in Polish and English. In order to assure highest measuring accuracy, mass comparator has semiautomatic adjusting system with external standard mass. Weighing pan of BPP-Y mass

comparator is manufactured in stainless steel technology, it is resistant against scratching, and easy to keep clean. All elements of mass comparator Series BPP-Y are made from metal, which eliminates the influence of electrostatic charges on weighing process.

Mass comparator is equipped with user friendly menu allowing for generation of GLP procedures as a standard printout or freely definable user printout. Mass comparator is equipped with RS 232 output, 2xUSB, Ethernet, 2 in/2 out.



**Option of detaching weighing indicator from weighing chamber**

**Comparison method of a standard with nominal mass 20kg**

**Comparison method of a standard with nominal mass 10kg**

Comparator is in high degree influenced by external conditions like temperature, breeze and vibrations. For the purpose of proper operation conditions, it is necessary to use the comparator in a room with very precise temperature control (laminar air-conditioning) & place of usage should be free from any vibrations.

Comparators do not undergo Legal Metrological Control. Main criterion of evaluation is repeatability. The software is equipped with application for estimating average deviation by method ABBA, for maximally 6 repetitions. After running the procedure, the software generates the report with results.

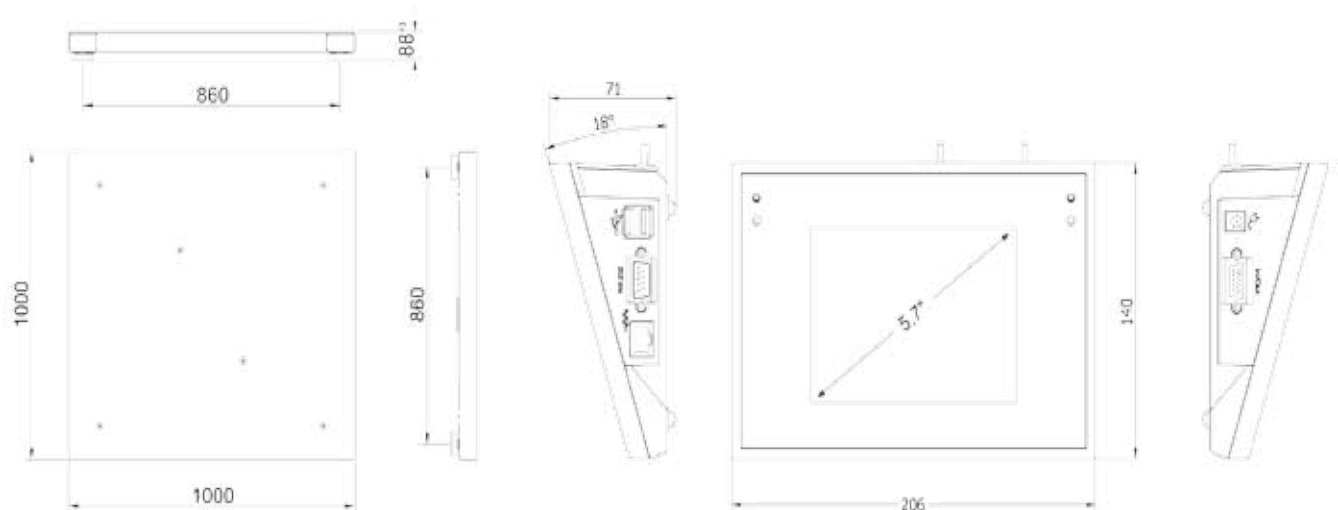
Model	BPP-20KO-Y
<b>Maximal capacity</b>	20kg
<b>Readability</b>	3mg
<b>Range of electromagnetic compensation</b>	19.5-20.5kg
<b>Repeatability</b>	2mg
<b>Stabilization time</b>	10 s
<b>Calibration</b>	external
<b>Pan size</b>	Ø230mm
<b>Calibration range according to OIML R111</b>	5kg-20kg (F1), 5kg-20kg (F2-M1)
<b>Working temperature</b>	+15 - +30°C
<b>Change rate of working temperatures</b>	±0.5°C/12h
<b>Humidity</b>	40-70%

**BWY-KO , Medical Mass Comparators**



Mass comparators are devices specially designer for determining the differences between the weight of checked standard mass (B) & weight of reference standard mass (A). Mass comparators are most often applicable in measuring laboratories, where calibration of weights and standard masses is performed. We includes in its offer mass comparators for calibration of weights & standard masses class M1 according to OIML R111, ranging from 500kg, 1000kg and 2000kg with readability 5g, 10g or 20g. Mass comparator Series BWY is equipped with big, backlit, graphic display, and user menu operating in Polish and English. In order to assure highest measuring accuracy, mass comparator has semiautomatic adjusting system with

external standard mass. Weighing platform is manufactured in mild steel technology. It is resistant against scratching and easy to keep clean. Mass comparator is equipped with user friendly menu allowing for generation of GLP procedures as a standard printout or freely definable user printout. Mass comparator is equipped with RS 232 output, 2xUSB & Ethernet.



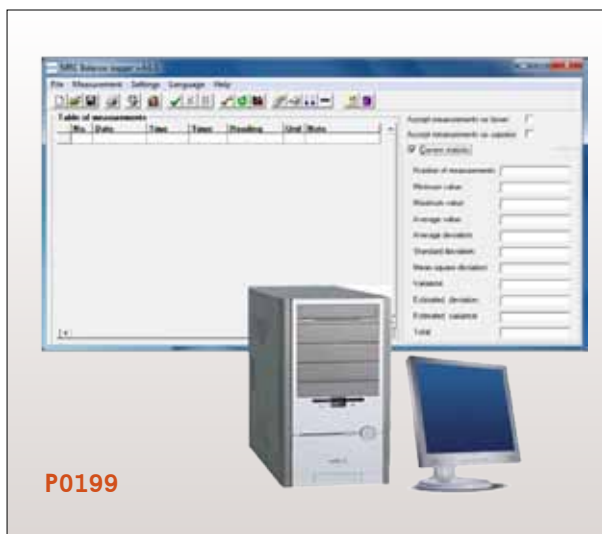
Comparator is in high degree influenced by external conditions like temperature, breeze and vibrations. For the purpose of proper operation conditions, it is necessary to use the comparator in a room with very precise temperature control (laminar air-conditioning) and place of usage should be free from any vibrations.

Comparators do not undergo Legal Metrological Control. Main criterion if evaluation is repeatability. The software is equipped with application for estimating average deviation by two methods: ABA or ABBA, for maximally 20 repetitions. After running the procedure, the software generates the report with results.

Model	BWY-510KO	BWY-1100KO	BWY-2100KO
<b>Maximal capacity</b>	510kg	1100kg	2100kg
<b>Readability</b>	5g	10g	20g
<b>Range of electromagnetic compensation</b>	0...510kg	0...1100kg	0...2100kg
<b>Repeatability</b>	5g	10g	20g
<b>Stabilization time</b>	10 s		
<b>Calibration</b>	external		
<b>Pan size</b>	1100x1270mm	1100x1270mm	1200x1500mm
<b>Calibration range according to OIML R111</b>	500 kg (M1-M3)	1000 kg (M1-M3)	2000 kg (M1-M3)
<b>Working temperature</b>	310 - +40°C		
<b>Change rate of working temperatures</b>	±2°C/24h		
<b>Humidity</b>	40-70%		

# B BALANCES

## P0199, Computer Software



P0199 software is designed for collecting measurement data from MRC weighing instruments & its statistics process.

### Designed for scales:

- With standard communication frame.

### Functions:

- Readout from instrument, record from measurements and saving data to a file
- Possibility of manual & auto registration of measurements
- Registration & storing of measurement data in a form of file
- Visualization of measurements data in a form of graph
- Static processing of measurement data
- Possibility of creating data from chosen measuring session
- Printout of measuring data, graphs and statistics
- Mainly used in laboratories.

### Computer requirements:

- processor 1,2 GHz
- free 500 MB on hard drive
- RAM 256 MB (recommended 512 MB)
- operation system Windows 2000/XP
- Language versions: German/English/French.

## BBA, BBB, BB Compact Balances



## Multi weighing units

- g Gram
- lb Pound(av)
- oz Ounce(av)
- ozt Troy ounce
- dwt Pennyweight
- GN Grain
- ct Carat
- tl Tael TW
- tl<sup>H</sup> Tael HK
- tl<sup>HJ</sup> Tael Jewel
- tl<sup>A</sup> Tola-Anna
- tl<sup>M</sup> Tola-Masha
- mm Momme



### Features:

- **Fast and stable weighing**  
High quality AD converter offers fast and stable weighing.
- **Multi selectable weighing units**  
– g, lb, oz, ozt, dwt, GN, ct, tl, tl<sup>H</sup>, tl<sup>HJ</sup>, tl<sup>M</sup>, tl<sup>A</sup>, mm.
- **Piece counting and percentage functions**
- **Comparator (Hi/Lo) function**
- **Bright and distinct LCD display**  
Large-sized bright LCD Display with 17 mm height digits.
- **Battery powered and auto-off timer**  
Advanced software for battery saving, rechargeable battery, low battery indication.
- **Leveling feet and level bubble**  
for accurate weighing
- **Portable-compact size, light weight, rugged body**
- **Stainless steel weighing pan.**

Model	BBA-600	BBA-1200	BB-1550	BB-3100
Capacity x Division(g)	600x0.01	1200x0.02	1500x0.05	3000x0.1
Pan size	118Φ		180mm x 140mm	
Display Type	6 segment LCD with backlight			
Dimension	185(W) x 211(D) x 59(H) mm			
Admissible Ambient Temp.	0°C ~ 40°C, RH<85%			
Weight	1.5kg			
Power	AC adapter (9V/500mA) or Re-chargeable battery (6V)			
Standard Accessories	Manual , AC/DC (9V) adapter			
Options	OP-01 Carrying case ; OP-02 Under hook			



PRINTER enables two-way thermal printing by mobile head.

The design of the mark: matrix 8 x 8 points. Print Speed: 0.75 line / sec.

Depending on the version, PRINTER can be equipped with real time clock, statistic functions or internal battery (outdoor operation).

Model	PRINTER-1/RG	PRINTER-1/Z/RG	PRINTER-1/RG Portable	PRINTER-1/Z/RG Portable	PRINTER-SQS
<b>Description</b>	base functions, (main current supply)	clock of real time, (main current supply)	base functions, (battery power and main current supply)	clock of real time, (battery power and main current supply)	date, time and statistic functions, (main current supply)
<b>Print</b>	Dual direction thermal print with moveable 8-point head, character construction: 8 x 8 point matrix, print speed: 0,75 line/s, quantity of signs a line: 40, 80				
<b>Set of characters</b>	One from below mentioned: IBM set 2, Mazovia, DHN, Latin-2 PC, Cirylics, Latin-2 ISO				
<b>Thermal paper</b>	Roll: width 112 mm, max diameter 42 mm, paper length 20 m, marking: TF 50KS-E2C				
<b>Power supply</b>	8,5V - 14V DC or 7V - 10V AC 50Hz, power consumption: 3W - 15W (max.), Power connection: type Jack 2.1, external power adapter: 220V / 9V AC 1,5A 50 Hz or battery (portable version)				
<b>Interface</b>	One from below mentioned: RS232C, RS242 (TTL), RS422A (RS485), power loop 20mA (CL), interface connection: 5 pin type DIN				
<b>Transmission parameters</b>	Speed of transmission: 1200, 2400, 4800, 9600 bod (other for social order.), transmission protocol: machine with DTR, Data format: 8 or 7 bytes, with or without parity control, parity: even or odd				
<b>Durability</b>	MTBF: 5000 hours, MCBF: 500 000 lines				
<b>Working conditions</b>	Working temperature: 5°C to 35°C, relative humidity: 10% - 80% (no condensation)				
<b>Weight , dimensions</b>	165 x 140 x 50 mm, 0,45 kg (without paper roll)				
<b>Printer marking with set of characters</b>	PRINTER IBM set 2, PRINTER 1 WIN 1250, PRINTER 2 DHN, PRINTER 3 Latin - 2 PC, PRINTER 4 Cirylica, PRINTER 5 Latin - 2 ISO				
<b>Components</b>	printer, external power adapter, interface plug or cable (according to order), roll of thermal paper, user manual, warranty and external power adapter (portable version)				

Model	TM-U200A	TM-U200B	TM-U200D
<b>Description</b>	with paper roll reeler and paper cutter	with paper cutter	basic version
<b>Means of print</b>	9-needle		
<b>Fonts</b>	7 x 9 / 9 x 9 points		
<b>Quantity of characters in one line</b>	paper 76.0 mm: 42/40/35/33 cpl 69.5 mm: 40/36/32/30 cpl 57.5 mm: 33/30/27/25 cpl		
<b>Character dimensions (mm)</b>	1.2 / 1.6 / 1.7 / 1.9 / 2.0(width) x 3.1(height)		
<b>Quantity of characters per inch</b>	17.8 / 16 / 14.5 / 13.3		
<b>Interfaces</b>	RS-232 or parallel or USB or Ethernet drive for cassette drawers, power adapter connection		

Model	TM-U200A	TM-U200B	TM-U200D
Input buffer	1 kB or 40 bytes		
Memory for logo	128 kB		
User defined memory	8 kB		
Print speed	6 lines / second (30 characters / line)		
Paper width	76.0 mm ±0.5 69.5 mm ±0.5 57.5 mm ±0.5		
Paper roll diameter	maximally 83 mm		
Coloring tape	ERC-38 purple, black or red-black		
Paper cutter	Cutter type "full cut" or "one-point-left cut" built in models type A and B		
Power consumption	Stand-by: 2.2 W while printing: 31 W		
Power adapter	included (compatible with PS-180)		
Cassette drawers	drive for two cassette drawers		
Durability	MTBF: 180 000 hours MCBF: 18 million lines cutter: 800 000 cuts		
Dimensions	160x286x158mm	160x248x139mm	160x248x139mm
Weight	2.7Kg	2.5Kg	2.3Kg
Colors	white: EPSON cool white or dark grey: EPSON dark grey		
Standard functions	paper reeler (type A) paper cutter (type A and B) easy paper exchange type "Drop-in" built in function Auto Status Back paper end sensor, paper end sensor, power adapter		
Options	wall hanger (for type B) customer display DM-D (connected through interface UB-S09)		
Standard EMI	sign CE, EN55022 class B, EN55024		
Safety standards	EN60950		

Model	CLP-521	CLP-621	CLP-631	CL-S700
Print	thermal	thermal, thermo-transfer	thermal, thermo-transfer	thermal, thermo-transfer
Head	200 dpi	200 dpi	300 dpi	200 dpi
Print speed	100mm/sec	100mm/sec	175mm/sec	250mm/sec
Maximal print width	104mm	104mm	104mm	104mm
Maximal print length	812mm	812mm	812mm	406mm
Minimal print length	12.7mm	12.7mm	12.7mm	12.7mm
Label width	19 - 118mm	19 - 118mm	12.5 - 118mm	25.4 - 118mm
Material thickness	0.0635 - 0.254mm	0.0635 - 0.254mm	0.0635 - 0.254mm	0.0635 - 0.254mm
Material kind	labels, cartoons, continuous media, folder			
Material recognition	overexposure optical sensor and light reflection from material		overexposure optical sensor and light reflection from material, optional moveable optical sensor	
Fonts	8 vector fonts, 1 half-tone screen		1 vector, 8 half-tone screen, True Type sensors in standard	
Bar codes	All standard types including: EAN-8, EAN-13, UPC-A, UPC-E, UCC/EAN 128, 3 with 9, 2 with 5, code 93, 128, Coderbar, Telepen, Zip and dual dimensions: PDF-417, UPS Maxicode, Posnet			
Communication interface	-	-	Parallel (Centronics) Series RS232C	
Control panel	-	-	4 buttons, 4 diodes LED	3 buttons, 2 diodes LED, display LCD
Input buffer	-	-	-	12KB
Memory	-	-	8MB	16MB
Memory extension	-	-	Flash 2MB memory cards	Flash 4MB memory cards
MTBF (average operation time between defects)	-	-	-	printer 1000km, printing head 30km
Dimensions (W×H×L)	-	-	224x288x270mm	255x480x253mm
Mass	-	-	4.5Kg	13.5Kg
Options	-	-	Paper cutter, divider, Ethernet, WLAN	Paper cutter, divider, Flash memory card, network input, real time clock



SAP/SAL

### SAP/SAL, Anti vibration Table

Anti vibration table can be used with as a base for analytical, laboratory or control balance. It has been designed for assurance of stable operation conditions while performing very accurate measurements.

- Including table independent bare.
- MDF painted table top.
- Mild steel profiles construction, adjustable height.
- Optional part in stainless and acid-proof construction.
- Table Size: 600Wx770Dx800Hmm, 25kg
- Marble concrete board Size: 270Wx410Dx115mmH, 29kg



### Set for determination of water vapor permeability

Permeability of water vapor is a feature which directly determines quality and application of a specific material, for instance cloth, shoes. Improper material if applied, may result in unhealthy or uncomfortable use.

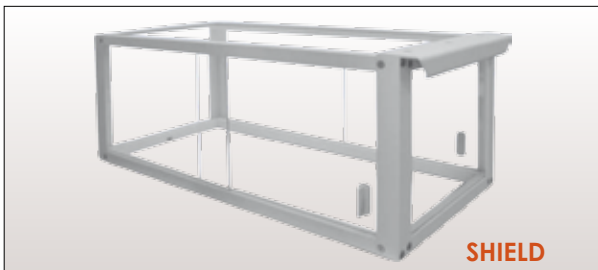


### Stand for under hook weighing

Stand for weighing loads in under hook weighing method. Loads are placed on special pan hanged on a hook mounted to the bottom of the scale.

#### Application:

- Measuring mass of magnetic materials.
- Measuring mass of non-standard dimensions or shapes.
- Determination of density of solids and liquids.
- Size (WxHxD): 330x210x335 mm



SHIELD

### SHIELD, Anti draught for Microbalances

Anti-draught chamber is intended for microbalances. It is an optional equipment of microbalances working in unfavorable conditions (air-draughts and breezes). It is mounted on a table, a microbalance is placed inside a chamber. It features sliding side windows allowing for free access into the weighing chamber of a microbalance.

- Internal size (WxHxD): 468x250x250 mm
- External size (WxHxD): 536.5x256x254 mm



SHIELD

The anti draught shield can be used for protecting the weighed objects against external environment, especially wind or breeze in production halls. It is Optional accessories to the balances Series BPS, ASB with pan size 128x128mm.

Protecting the weighed objects against wind has very good influence of measuring results. It eliminates the possibility of vibration of an object caused by external conditions while taking its measurements.

Size (WxHxD): 203x200x264 mm



DENSITY

### DENSITY, Cereal Kit

This kit is designed for determination of density of cereals. Measurement of cereal density in loose state is performed with application of precise balance Series BPS-X4500G and density kit for cereals. Density determination result is calculated automatically by balance software (in accordance to tables containing cereal density).

It is possible to determine the density of following cereal: wheat, oats, barley, rye. Its volume is 1 Liter.

The cereal density kit allows for determination of density according to norm: PN-73/R-74007.

# BALANCES Density Kit/Weights Classification

## P0180, Density Kit

Determining the density of solids and liquids is an inseparable part of work of the laboratories. Traditional method of density determination requires from the operator many measurements and a lot of complex calculation. In result the operator ends with a density determination result which can be saddled with calculation and systematic errors. Additionally time that needs to be devoted to density calculation is long. In case of determining the density of solids and liquids with application of MRC density determination kit, the whole procedure is very much simplified and speeded up. Time till the operator receives the density measurement is very short, as all the calculation is performed by the software of the weighing instrument, & operator's activities is limited to:

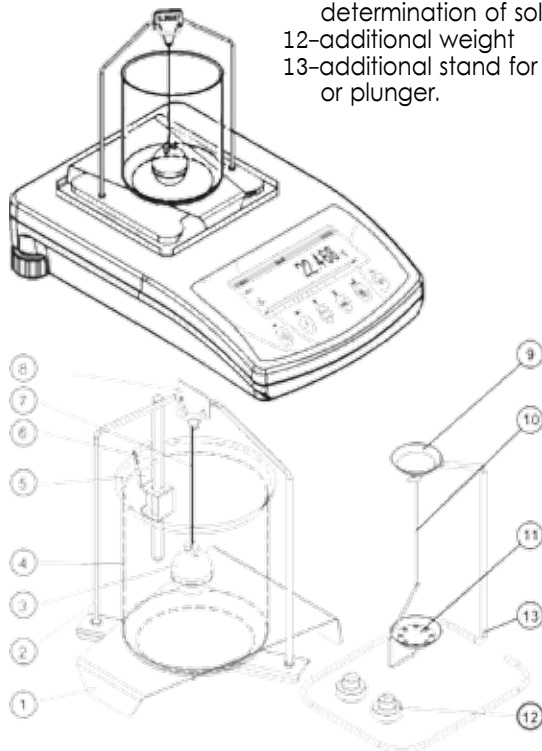
- operation of the keyboard of weighing instrument
- placing the samples on the weighing pans of the kit
- hanging the plunger

Density determination kit is Optional accessories offered to MRC laboratory balances. The software for determination of density has following basic features:

- simplicity of usage (all activities are described on the display of the balance)
- reliability (all calculation is automatically performed by the balance's software)
- fast data processing (result is obtained after determination of sample mass in water or plunger mass in liquid)
- accurate data processing (before every measurement of mass, display indication is automatically zeroed, this proves the density determination result to be reliable and real).

- 1-beaker base
- 2-pans suspension
- 3-plunger
- 4-beaker
- 5-thermometer holder
- 6-thermometr

- 7-plunger string
- 8-hook
- 9-upper pan of the set for density determination of solids
- 10-pan string
- 11-lower pan of the set for density determination of solids
- 12-additional weight
- 13-additional stand for set of pans or plunger.



## Selection of the appropriate test weight for your balance

A balance can never be more accurate than the test weight used to adjust it, it depends on its tolerance.

Accuracy of the test weight: Should correspond to the readout d of the balance, rather than something better.

Nominal weight value: This is shown in adjust mode "CAL" in the balance display. Given the choice, the heaviest weight is the most suitable for accurate measurement.

## OIML Directive

### The key points from the OIML Directive

OIML (Organization International de Metrologies Legal) has established the exact metrological requirements for weights in verified applications in approx. 100 states all over the world. The OIML recommendation R111 (2004 Edition) for weights relates to sizes 1mg-50 kg. Statements are made on the accuracy, materials, geometric shape, marking & storage of the weights.

### Error limits for weights of classes E1 to M3

The error limit classes are in fixed hierarchical levels in the proportion of 1:3, where E1 is the most accurate and M3 is the least accurate weight class. When testing weights with other weights, the correct test class is the next highest class.

### Error limit classes (= tolerances)

The values given in the table below (tolerances ± ... mg) are the respective permitted fabrication tolerances. They are to be equal to the measuring uncertainty of the weight, if no DKD calibration certificate is available.

Nominal Value	OIML Max. permissible errors for weights=permissible tolerances "Tol ± mg"				
	E1	E2	F1	F2	M1
1mg	±0.003mg	±0.006mg	±0.020mg	±0.06mg	±0.20mg
2mg	±0.003mg	±0.006mg	±0.020mg	±0.06mg	±0.20mg
5mg	±0.003mg	±0.006mg	±0.020mg	±0.06mg	±0.20mg
10mg	±0.003mg	±0.008mg	±0.025mg	±0.08mg	±0.25mg
20mg	±0.003mg	±0.010mg	±0.03mg	±0.10mg	±0.3mg
50mg	±0.004mg	±0.012mg	±0.04mg	±0.12mg	±0.4mg
100mg	±0.005mg	±0.016mg	±0.05mg	±0.16mg	±0.5mg
200mg	±0.006mg	±0.020mg	±0.06mg	±0.20mg	±0.6mg
500mg	±0.008mg	±0.025mg	±0.08mg	±0.25mg	±0.8mg
1g	±0.010mg	±0.03mg	±0.10mg	±0.3mg	±1.0mg
2g	±0.012mg	±0.04mg	±0.12mg	±0.4mg	±1.2mg
5g	±0.016mg	±0.05mg	±0.16mg	±0.5mg	±1.6mg
10g	±0.020mg	±0.06mg	±0.20mg	±0.6mg	±2.0mg
20g	±0.025mg	±0.08mg	±0.25mg	±0.8mg	±2.5mg
50g	±0.03mg	±0.10mg	±0.3mg	±1.0mg	±3.0mg
100g	±0.05mg	±0.16mg	±0.5mg	±1.6mg	±5.0mg
200g	±0.10mg	±0.3mg	±1.0mg	±3.0mg	±10mg
500g	±0.25mg	±0.8mg	±2.5mg	±8.0mg	±25mg
1kg	±0.5mg	±1.6mg	±5.0mg	±16mg	±50mg
2kg	±1.0mg	±3.0mg	±10mg	±30mg	±100mg
5kg	±2.5mg	±8.0mg	±25mg	±80mg	±250mg
10kg	±5.0mg	±16mg	±50mg	±160mg	±500mg
20kg	±10mg	±30mg	±100mg	±300mg	±1000mg
50kg	±25mg	±80mg	±250mg	±800mg	±2500mg
100kg		±160mg	±500mg	±1600mg	±5000mg
200kg		±300mg	±1000mg	±3000mg	±10g



Example of Calibration certificate:

**mrc**  
 Calibration laboratory accredited by  
 Polish Centre for Accreditation, a signatory to EA, ILAC and ILAC-MRA  
 that include recognition of calibration certificates.  
 Accreditation No. AP 069

**CALIBRATION CERTIFICATE**

Date of issue: 22-09 November 2009 Certificate No. [redacted] Page: 1 / 2

**OBJECT OF CALIBRATION**  
 Non-automatic electronic weighing instrument  
 Model: AS 60C/2 Serial No: [redacted]  
 Manufacturer: MRC Ltd.  
 Characteristic: [redacted]  
 Max capacity Max: 60g Repeatability: 0.01mg

**APPLICANT**  
 [redacted]

**USER**  
 [redacted]

**PLACE OF CALIBRATION**  
 [redacted]

**CALIBRATION METHOD**  
 Calibration Procedure PW-01 Rev. V - 10-th January 2007

**ENVIRONMENTAL CONDITIONS**  
 Air temperature [°C]: (21.1-21.5) ± 0.5  
 Relative air humidity [%]: (48.1-48.5) ± 2.5

**DATE OF CALIBRATION**  
 10-th November 2009

**TRACEABILITY**  
 Calibration results were referred to national mass standard maintained in Polish metrology institut - Główny Urząd Miar (GUM) with the application of mass standards numbers: 147.

**CALIBRATION RESULTS**  
 The results have been presented on page 2 of this certificate including uncertainty of measurement.

**UNCERTAINTY OF MEASUREMENT**  
 Uncertainty of measurement has been evaluated in compliance with EA-4/02. The expanded uncertainty assigned corresponds to a coverage probability of 95 % and the coverage factor k = 2.

This certificate may be presented or copied as a whole document only.



Sets of masses

Ordering Information:

Model: Weight-S - [ ] - [ ]

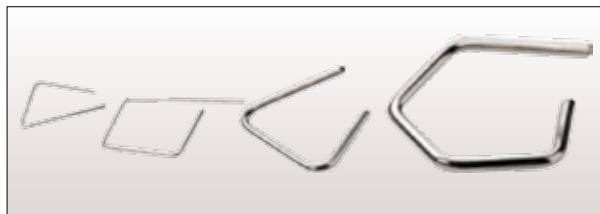
- E1 1mg - 500mg (12pcs)
- E2 1g - 100g (9pcs)
- F1 1g - 200g (11pcs)
- F2 1g - 500g (12pcs)
- M1 1g - 2kg (15pcs)
- 1kg - 5kg (4pcs)



Ordering Information:

Weight-1- [ ] - [ ]

- E1 1mg
- E2 2mg
- F1 5mg
- F2 10mg
- M1 20mg
- 50mg
- 100mg
- 200mg
- 500mg



Ordering Information:

Weight-2- [ ] - [ ]

- E1 1mg
- E2 2mg
- 5mg
- 10mg
- 20mg
- 50mg
- 100mg
- 200mg
- 500mg



Single standard masses

Ordering Information:

Model: Weight - [ ] - [ ]

- E2 1g, 200g
- F1 2g, 500g
- F2 5g, 1kg
- M1 10g, 2kg
- 20g, 5kg
- 50g, 10kg
- 100g, 20kg



**WB-Series**

### WB-Series, For Full Visibility Of Samples

#### Features:

- Low-cost fully compatible substitute for expensive Water Bath.
- Seamless transparent polycarbonate tank-withstands temperature 120°C.
- Fast-Acting thermostat also serves as low-water-level protector, preventing heating-element burn-out & fire hazard.
- Temperature setting in °C from ambient to +100°C
- Temperature control accuracy of approximately  $\pm 1^\circ\text{C}$  ensures precise test conditions
- Robust & reliable - designed for years of trouble-free service.



Removable Modular Heating Assembly enables convenient cleaning of all parts & makes it usable in other vessels.



### WBS-Series, With Safety Thermostat

These Water Baths are identical to the WB models but are equipped with an additional Safety Thermostat.

### WB-Special:



**According to customer dimensions**



WB(S)-14 Water Bath becomes a Boiling Bath when combined with EL-14 Evaporation Lid

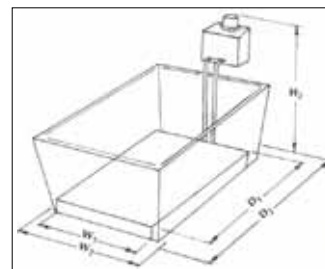


### WBSD Series: With Digital Control C-7

**WBSD-7**

### WBSD Series, Transparent Polycarbonate Thermostatic Bath

Ideal for sample pre treatment in QC, pathology and educational purposes, routine laboratory purposes, procedures requiring visibility of reactions inside the vessels & as a 'personal' water bath for scientists needing only a small working area with a compact footprint. Temperature control accuracy of approximately  $\pm 0.2^\circ\text{C}$  ensures precise test conditions.



### Accessories:

#### Evaporation lids



**EL-30/8**

**EL-14**

**EL-5**

**EL-30/11**

Evaporation Lids (EL) for use with WB and WBS Baths. Each Lid has openings equipped with concentric rings. The rings reduce the diameters of the openings to accommodate containers of all sizes. The EL-5 Lids, for use with WB(S)-5 Baths, have four 80 mm diameter openings.



### Balls Blanket

A balls blanket of Floating Polypropylene Balls is most effective for reducing evaporation and loss of heat from the Water Bath. The Balls act as effectively as a lid (flat or gabled), while enabling immersion and removal of flasks & other vessels without having to lift a lid. Usable UP to 110°C.

### Floating balls

A balls blanket of Floating Polypropylene Balls is most effective for reducing evaporation and loss of heat from the Water Bath. The Balls act as effectively as a lid (flat or gabled), while enabling immersion and removal of flasks & other vessels without having to lift a lid. Usable UP to 110°C.



### Bath covers

**C-14**

**C-3**



Temp. Range: from slightly above ambient to +100°C (with cover)  
 Accuracy: approx.: 0.3°C at 37°C (depending on operating conditions).  
 Voltage: 230 V, 50 Hz (or 120 V, 50/60 Hz).

							Accessories		
Standard model	With safety thermostat model	Digital model	Bath capacity (Liters)	Inside dim's (cm) W1xD1xH1	Outside dim's (cm) W2xD2xH2	Watts	Bath cover model	Floating balls model	Evap. lid model
WB-3	WBS-3	WBSD-3	2.7	10 x 17 x 10	15 x 31 x 24	500	C-3	FB-3	-
WB-4	WBS-4	WBSD-4	4.5	10 x 27 x 10	16 x 41 x 24	600	C-4	FB-4	-
WB-5	WBS-5	WBSD-5	5.5	16 x 20 x 11	22 x 34 x 24	750	C-5	FB-5	EL-5
WB-7	WBS-7	WBSD-7	7.0	16 x 3 x 11	22 x 44 x 24	1000	C-7	FB-7	-
WB-8	WBS-8	WBSD-8	8.5	21 x 35 x 12	28 x 50 x 26	1000	C-8	FB-8	-
WB-11	WBS-11	WBSD-11	11.0	18 x 27 x 16	24 x 43 x 30	1200	C-11	FB-11	-
WB-14	WBS-14	WBSD-14	14.0	21 x 35 x 16	28 x 50 x 30	1500	C-14	FB-14	EL-14
WB-30	WBS-30	WBSD-30	30	32 x 51 x 18	38 x 66 x 24	*2000	C-30	FB-30	EL-30/8/11



- Features:**
- Low-cost fully compatible substitute for expensive Water Bath.
  - Stainless steel tank, easy to clean.
  - Fast-Acting thermostat also serves as low-water-level protector, preventing heating-element burn-out and fire hazard.
  - Temperature setting in °C from ambient to +100°C
  - Temperature control accuracy of approximately ±1°C ensures precise test conditions
  - Robust and reliable - designed for years of trouble-free service.

\*1500W at 120V



- Specifications:**
- Temperature range: from slightly above ambient to +100°C (with cover).
  - Accuracy: approx. ±1°C (at 37°C), WBSTD ±0.2°C
  - Voltage: 230V. 50 Hz (or 120V. 50/60Hz).

Standard model	With safety thermostat model	Digital model	Bath capacity (Liters)	Inside dim's (cm) W1xD1xH1	Outside dim's (cm) W2xD2xH2	Watts	Bath cover model	Floating balls model	Evap. lid model
WBT-5x15	WBST-5x15	WBSTD-5x15	5.0	13 x 26 x 13		500	CS-5	FB-5	
WBT-6x20	WBST-6x20	WBSTD-6x20	6.0	18 x 26 x 12		750	CS-6	FB-6	
WBT-8x15	WBST-8x15	WBSTD-8x15	8.0	13 x 26 x 20		1000	CS-8	FB-8	
WBT-10x20	WBST-10x20	WBSTD-10x20	10.0	18 x 26 x 20		1200	CS-10	FB-10	
WBT-11x15	WBST-11x15	WBSTD-11x15	11.0	13 x 28 x 28		1200	CS-11	FB-11	
WBT-15x20	WBST-15x20	WBSTD-15x20	15.0	18 x 26 x 26		1700	CS-15	FB-15	
WBT-25x20	WBST-25x20	WBSTD-25x20	25.0	18 x 48 x 28			CS-25	FB-25	
WBT-60x20	WBST-60x20	WBSTD-60x20	60.0	18 x 60 x 48			CS-60	FB-60	



### WBO-Series, Unstirred Up To 80°C Water Bath

The MRC stainless steel water bath are available in 2 sizes: 10 & 20 Liters. Model WBO-100 and WBO-200 unstirred bath are used for general applications in laboratories. They provides excellent temperature uniformity of the liquid. A PID temperature controller provides instant and accurate temperature. The tank of the bath is made of corrosion resistant stainless steel with round corners for easy cleaning. Include hood cover.

#### Features:

- Ideal for biotechnology, clinical, environmental, medical, petroleum, food industry
- Stainless steel lid prevents evaporation & keeps constant temperature
- Excellent uniformity & stability
- Seamless, corrosion-resistant, stainless steel chamber
- Available in 10, 20 Liters
- Gable cover included.



#### Applications:

- Incubate cultures
- Warm bacteriological media
- Perform chemical reactions
- Thaw samples.

Model	WBO-100	WBO-200
Temp. range	Room temperature ~ +5°C to 80°C	
Temp. constancy	±0.1	
Temp. control	PID	
Heater	300W	600W
Safety devices	Short circuit, over head protector, sensor abnormality	
Bath opening (mm)	W295xD235xH150	W495xD295xH150
Inside dimensions (mm)	W295xD235xH150	W495xD295xH150
Outside dimensions (mm)	W420xD280xH185	W620xD340xH185
Volume	10L	20L
Weight	6.5 kg	9 kg

**W2M-2, W6M-2, W14M-2, W20M-2, Water Baths Digital Series**



W2M-2

The MRC high-performance water baths are accurate, easy to use, safe and durable. The water bath design incorporates a drip free cover holster and pocket handles so users can easily transport the water bath.

A microprocessor achieves precise temperature control regardless of how the unit is loaded. Calibration is performed with the convenient, front panel touch pad.

We were the first to introduce the non-contact recessed heating element to the analytical research marketplace. This design specifically curtails element burnout and eliminates tank hot spots that are chronic challenges for other water baths.

The MRC Digital water baths remain an industry standard for precise control and quality of design. The operator is able to calibrate this bath using the touch pad controls. This is a convenient feature for facilities concerned with IQ/OQ/PQ validation. The MRC constant temperature digital water baths are perfect for conducting a host of applications including; bacteriological examinations, food processing/QC procedures and microbiology assays just to name a few.

**Features:**

- Easy-to-Clean Stainless Steel Tank.
- Pocket Handles for Easy Lifting.
- Recessed Heating Element Prevents "Burnout".
- Unique Design Eliminates "Hot Spots".

**Applications:**

- Sample Thawing.
- Bacteriological Examinations.
- Warming Reagents.
- Coliform Determinations.
- Microbiological Assays.

Model	W2M-2	W6M-2	W14M-2	W20M-2
Exterior Dimensions (wxdxh)	38.1 x 30.5 x 22.3 cm	38.8 x 30.5 x 22.9 cm	38.1 x 48.3 x 22.9 cm	38.1 x 64.2 x 22.9 cm
Bath Tank Dimensions (wxdxh)	29.8 x 14.6 x 6.3 cm	29.8 x 15.2 x 15.2 cm	29.8 x 33.0 x 15.2 cm	29.2 x 49.5 x 15.8 cm
Tank Capacity	2L	7L	15L	23L
Stainless Steel Gable Cover(s)	One Included	One Included	One Included	One Included

**W614M-2, Dual Chamber Water Bath**



W614M-2

Model	W614M-2	
Exterior Dimensions (wxdxh)	61.6 x 48.9 x 22.3 cm	
Chambers	Tank 1	Tank 2
Bath Tank Dimensions (wxdxh)	29.8 x 15.2 x 15.2 cm	29.8 x 33.0 x 15.2 cm
Tank Capacity	7L	15L
Stainless Steel Gable Cover(s)	Two Included	



#### WBH-Series, Digital Precise Circulation Water Bath

There are 2 models with internal circulation pump, 10 & 20 Liters. The immersion circulator bridge can easily remove for easy cleaning of the tank.

**Features:** Ideal for Biotechnology, Clinical, Environmental, Medical, Petroleum, Food Industry, Pharmaceutical or Industrial Applications • Powerful Circulation Pump Assures Temp. Uniformity.: Internal and optional external Circulation • Stainless Steel Bath(#304) for Superior Durability & High Thermal Efficiency • Stainless Steel lid Prevents Evaporation and keeps Constant Temperature.



External Circulation Option

Model	WBH-100	WBH-200	WBH-200I
Temp. range	Ambient +5°C to 100°C		
Temp. constancy	±0.1		
Temp. control	PID		
Internal circulating pump	9Liter/Minute		
External circulating pump	No	No	Yes
Heater	800W	1000W	
Safety devices	Short circuit, over head protector, sensor abnormality		
Bath opening (mm)	W200xD235xH150	W400xD295xH150	
Inside dimensions (mm)	W295xD235xH150	W495xD295xH150	
Outside dimensions (mm)	W340xD280xH320	W540xD340xH320	
Volume	10L	20L	
Weight	7kg	10kg	

#### WBH-060, Internal and External Circulation Bath

The MRC WBH-060, 6 Liter heating bath, is the most user-friendly baths available. This heating circulator is mainly used for temperature

controlling larger external systems such as heating plates, autoclaves or reaction vessels. Combined powerful pressure/suction pumps provide a good heat exchange and optimum temperature accuracy; robust design using high grade stainless steel inside and outside the bath. MRC heating circulator with stainless steel bath tank is mainly used for internal and external temperature tasks. simultaneous temperature applications of smaller objects can also be carried out directly in the internal bath of the circulator.



Model	WBH-060
Working range	Ambient +5°C~100°C
Volume	6 Liter
Stability	±0.05°C
Setting&Readout	Digital
Heater	500W
Pumping flow	7L/min, 0.2kg/cm <sup>2</sup>
Reservoir(mm)	W150xD255xH150
Overall(mm)	W210xD315xH330
Power source	110/220V 60/50Hz 5/2.5A

## WPC65-2, WPC95-2, Water Baths Speciality – Circulating &amp; Deep Chamber



WPC65-2

MRC Special application water baths boast the same features as our other high-performance models, such as: being highly accurate, easy-to-use, rugged, and safe. MRC WPC water baths include polymer coating for quick cleaning.

The MRC Water Baths are truly unique in construction. MRC Manufacturing was the first to introduce the non-contact recessed heating element, found on this type of product, to the analytical research marketplace. This design specifically curtails element burnout and eliminates tank hot spots that are chronic challenges for other water baths.

The MRC Digital water baths remain an industry standard for precise control and quality of design. The operator is able to calibrate this bath using the touch pad controls. This is a convenient feature for facilities concerned with IQ/OQ/PQ validation. The MRC constant temperature digital water baths are perfect for conducting a host of applications including; bacteriological examinations, food processing/QC procedures and microbiology assays just to name a few.



WPC 95

**Features:**

- Easy-to-Clean Stainless Steel Tank.
- Pocket Handles for Easy Lifting.
- Recessed Heating Element Prevents "Burnout".
- Unique Design Eliminates "Hot Spots".

**Precise Temperature Control:**

- Over Temperature Protection.
- Temperature Uniformity +/- 0.2% at 37°C.
- Temperature Range Ambient + 5°C to 80°C.

**Applications:**

- Sample Thawing.
- Bacteriological Examinations.
- Warming Reagents.
- Coliform Determinations.
- Microbiological Assays.

Model	WPC65-2	WPC95-2
Exterior Dimensions (wxdxh)	38.1 x 64.8 x 22.9 cm	40.7 x 48.9 x 38.8 cm
Bath Tank Dimensions (wxdxh)	29.2 x 49.5 x 15.8 cm	30.4 x 35.5 x 30.4 cm
Tank Capacity	23L	30L
Stainless Steel Gable Cover(s)	One Included	Not Included



**TEPS-1, Immersion Circulator – Basic Model**

**Features:**

- Temperature range: ambient to 100°C (with cooling +10 to 100°C).
- Accuracy: approx.  $\pm 0.3$  to  $\pm 1^\circ\text{C}$ .
- Pumping capacity: up to 12 l/min.
- Safety Cut Off.
- 12L/min max. head 2m.
- Immersion depth: min. 6cm, max. 15.5cm.
- **Optional: External circulation apparatus.**



**TEPS-4, Digital Immersion Circulator**

**Features:**

- Digital set and display of actual operating temperatures.
- PID controller provides very precise temperature control.
- Adapts to many different containers.
- Temperature range: ambient +5°C to 100°C (with cooling -10°C to 100°C),
- **Optional up to 200°C (for oil).**
- Accuracy: approx.  $\pm 0.1^\circ\text{C}$ .
- Pumping capacity: up to 12 l/min.
- Immersion depth: minimum 6 cm, maximum 15.5 cm.
- Safety Cut Off.

Model	TEPS-1	TEPS-4
Temperature range	up to 100°C	
Temperature stability	$\pm 0.3^\circ\text{C}$ to $1^\circ\text{C}$	$\pm 0.1^\circ\text{C}$
Controller	Basic analog	PID Digital
Readout	Thermometer	Digital $^\circ\text{C}/^\circ\text{F}$
Pumping flow	12 Liter/min	
Immersion	Minimum 6cm, Maximum 155mm	
Heater	1000Watt (optional, 1500, 2000watt)	
Over temp. safety	Adjustable	
Dimensions (mm)	W200xD240xH90 / W120xD140xH135	W200xD240xH90 / W120xD140xH135
Weight	2kg	2.3kg

**TB-Series, Polycarbonate Tank TB Type For Immersion Thermostat / Circulator**

PC Tank with bridge for fixing immersion circulator TEPS-1/TEPS-4, Seamless Transparent Polycarbonate Tank - withstands 120°C. Heating circulators are commonly used for cell cultures, enzyme assays, coliform testing, DNA incubation & procedures.

TB-7	16x30x13cm-Height, 7 Liter
TB-8	21x35x14cm-Height, 8.5 Liter
TB-11	18x27x18cm-Height, 11 Liter
TB-14	21x35x18cm-Height, 14 Liter
TB-30	32x51x20cm-Height, 30 Liter







**TEPS-V6, Portable clip-on digital immersion circulator**

MRC immersion heaters and water baths with a precise temperature controlled environment, to produce consistently perfect results. Ideal for sous vide and other demanding applications.

MRC immersion circulator is a space saving clip on heater/stirrer unit. It can be easily fitted to a standard stainless or polycarbonate gastronorm square tank or round (minimum depth 18cms) and maximum volume of approximately 60 Liters.

For large tanks and pots there are several immersion heaters with higher wattage and immersion lengths. Precise temperature achieved by PID high precision controller, accuracy and repeatability are guaranteed. Actual temperature is clearly displayed to 0.1°C. Temperature settings are retained in memory even after 'power off'.

Temperatures can be easily and rapidly set with the push button, wipe clean control panel. Easy clamping method, safety protection for low water level and optional sturdy handle for easy carrying.

The case is constructed from high quality stainless steel.

If the water drops below the recommended minimum level or the unit is inadvertently switched.

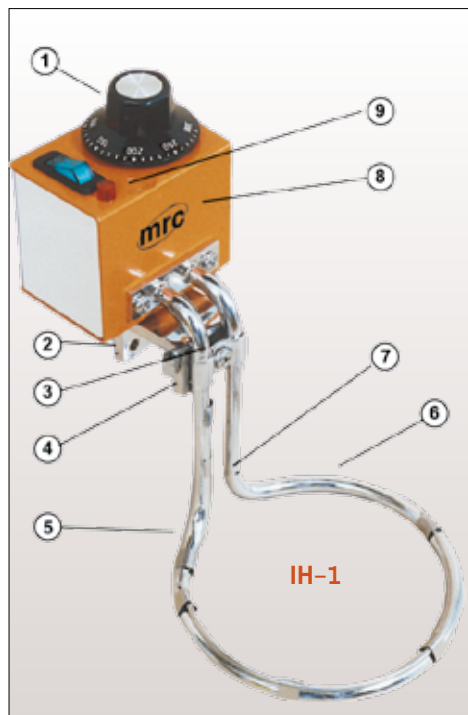
**Applications:**

- Laboratory water baths
- Calibration baths
- Sous vide.

**Easy Clamping Method**



Model	TEPS-V6
Display/resolution	Digital LED/0.1°C
Temp. range	Ambient + 5°C - 95°C
Temp. setting	Push button
Stability	±0.1°C
Display/resolution	Digital LED/1 min. increments
Dimensions (mm)	Stirrer case: W122 x D153 x H200 (includes handle) Guard: W122 x D132 x H148 Allow 90mm at rear of unit for mains cable/ventilation
Electrical supply	230V
Power consumption	1kW (Optional: 2000, 2600, 3000 watt)

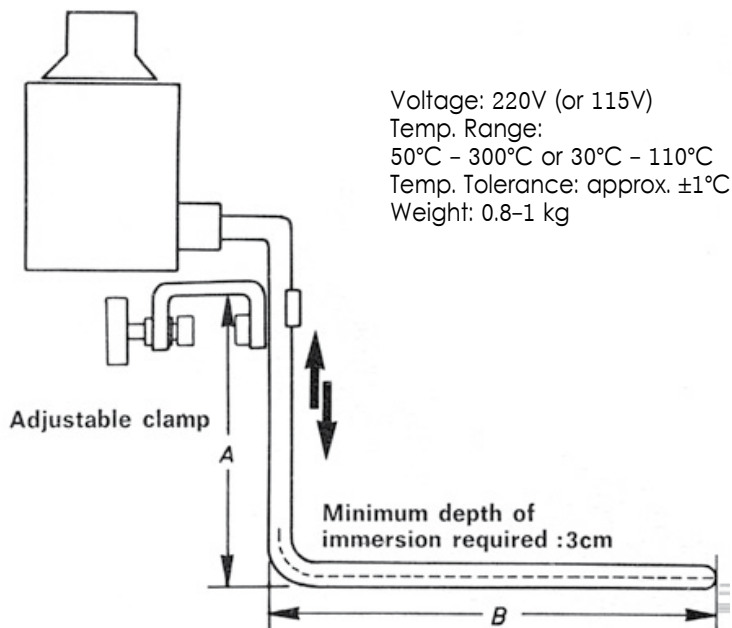


### IH-Series, Thermostatic Controlled Immersion Heaters

#### Immersion heat:

Thermostatically Controlled Immersion Heaters.

Reliable element for accurately heating liquids to temperatures of up to 300°C with a tolerance of approx.  $\pm 1^\circ\text{C}$ . Designed for trouble-free application. Suitable for use in science and industry for: Distillation, evaporation, sterilization, rotary evaporation, ultrasonic cleaning, photographic bath etc.



#### IMMERSION HEATER IH-1

- 1- Temperature setting in  $^\circ\text{C}$
- 2- Threaded hole for attachment to stand
- 3- Height adjustment permits wide range of application
- 4- Mounting bracket (patented design) with teflon-tipped disc permitting secure clamping to all surfaces, including glass
- 5- Heating element chromium-plated copper sheath: also available in stainless steel on special order
- 6- Fast-acting thermostat also serves as low-level cut-out, preventing element burn-out and fire hazard
- 7- Shallow immersion depth (3 cm)
- 8- The control housing is located outside the vessel and thus protected against vapors and temperature effects
- 9- Indicator light



Model 50-300°C	Digital 50-300°C	Model 50-110°C	Digital 50-110°C	Watts	"A" mm	"B" mm $\varnothing$
IH3/13	IHSD-3/13	IH1/13	IHSD-1/13	500	100	130
IH3/15	IHSD-3/15	IH1/15	IHSD-1/15	750	110	150
IH3/17	IHSD-3/17	IH1/17	IHSD-1/17	750	120	170
IH3/19	IHSD-3/19	IH1/19	IHSD-1/19	1000	130	190
IH3/21	IHSD-3/21	IH1/21	IHSD-1/21	1000	150	210
IH3/23	IHSD-3/23	IH1/23	IHSD-1/23	1250	180	230
IH3/25	IHSD-3/25	IH1/25	IHSD-1/25	1500	200	250
IH3/27	IHSD-3/27	IH1/27	IHSD-1/27	1500	200	270

#### Immersion heater Features:

- Easily converts any container into a thermostatically controlled bath from ambient to 300°C.
- Rugged, reliable, convenient, maintenance-free, energy-saving & reasonable priced.
- Fully valid substitute for expensive water and oil baths.
- Permits utilization of the entire contents of the container, without effecting the functioning of stirrers.
- Heat is applied directly to the liquid, ensuring rapid rise of temperature.
- Safe - fast acting thermostat server as low-water level cut out.
- You get the temperature you set.
- Control box is located on the outside and is unaffected by vaporous and temperature effects.



### WBL-Series, Digital Precise Refrigerated Bath, Internal and External Circulator

#### Refrigerated Circulating Baths

- Compact design.
- For external & internal temperature applications.
- Low noise level.
- Rapid cool down and heating time.
- Water drain for easy cleaning of the inner tank.
- Models WBL-200 has casters.
- Water level protector.
- Ideal for direct immersion of samples or external circulating system in the field of biotechnology and laboratories.
- Powerful circulation pump ensures temp. uniformity: internal and external circulation.
- Connection with evaporator or viscometer is applicable.

#### Options:

- Display resolution to 0.01°C
- Build in RS-232/485
- PT-100Ω temperature probe for direct measurements and control of external systems
- Analog inputs and outputs for external programmer and temperature recorder.



Model	WBL-100	WBL-101	WBL-200
Temperature range	-30°C~100°C		
Temp. constancy	±0.1°C		
Temp. control	PID		
Temp. sensor	PT-100Ω		
Circulation pump	9L/min. max. head 2m	18L/min. max. head 7m	27L/min. max. head 7m
Heater	1600W		2500W
Refrigerator	1/3HP		1 HP
Safety devices	Short circuit breaker, over heat protector, sensor abnormality, overload protector		
Bath opening (mm)	W200xD150xH150		W300xD210xH180
Bath dimension	W200xD300xH150		W300xD360xH180
Outside dimensions	W315xD450xH630		W420xD530xH800
Volume	9.0L		19.4L
In/Output	9.5mm		12.5mm
Weight	35kg		63kg

**WBT-200/400/401, Digital Precise Shaking Water Bath, 22 & 38 Liter, & Digital PID Control, Reciprocating Motion, 20~200rpm, to 100°C, ±0.1°C, up to 1 Liter Flask**



These reciprocating water bath shakers are available in three models. Model WBT-200 small platform 250x300mm, Model WBT-400 large platform 300x400mm & Model WBT-401 refrigerated to 0°C. Temperature control is precise, temp. range of 5°C above ambient to 100°C, speed range 20 - 200 rpm, heat loss and evaporation minimized with use of stainless steel hood cover.

Easy emptying through a drain at the lowest point.

Micro processor temperature PID controller with dual display of measured temperature and set temperature.

**Electronically Controlled Shaking Mechanism Provides Quiet Reciprocating Motion and Precise Speed Control.**

**Options:**

- Water level protector.
- Universal platform.
- Digital speed control.



**Universal Spring Racks**

**Optional: Tube Holders**



**AC-220-30-16**



**WBT-200D  
Optional: Dig. Speed Control**

**Features:**

Stainless Steel Bath for Superior Durability & High Thermal Efficiency • Innovative Easy-to-Use Digital PID Controller • Electronically Controlled Shaking Mechanism Provides Quiet Reciprocating Motion and Precise Speed Control • Universal Stainless Steel Spring Rack (Optional): for various kind of Flasks dishes and Tubes (optional) • Patent shaking mechanism: minimum noise and vibration.



**Flask Holders**

Model	WBT-200	WBT-400	WBT-401
<b>System</b>	Reciprocation shaking circulation		
<b>Temp. range</b>	Room temperature - 100°C		0°C-100°C
<b>Temp. constancy</b>	±0.1°C		
<b>Temp. control</b>	PID		
<b>Temp sensor</b>	PT-100Ω		
<b>Inside material</b>	SUS304		
<b>Rate of shaking</b>	20~200 rpm		
<b>Shaking width</b>	20 and 40 mm variable		
<b>Shaking plate (mm)</b>	W300xD250xH130	W400xD300xH160	
<b>Refrigerator</b>			1/4HP
<b>Heater</b>	1.0KW	1.6KW	
<b>Safety devices</b>	Short circuit breaker, over heat protector, sensor abnormality, refrigerator over protector		
<b>Inside dimensions (mm)</b>	W500xD300xH150	W600xD350xH180	
<b>Outside dimensions (mm)</b>	W700xD350xH300	W830xD415xH350	W980xD415xH430
<b>Volume (Liters)</b>	22.5	37.8	
<b>Weight</b>	25kg	30kg	53kg

capacity of flasks	50 ml	125 ml	250 ml	500 ml	1000 ml
<b>WBT-200 number of flasks</b>	20	12	6	4	2
<b>WBT-400/401 number of flasks</b>	35	20	12	6	4

**WS17-2, WS27-2, Shaking Water Baths, Digital Speed Control**



Shaking Water Baths (also known as Reciprocating Water Baths), are designed to handle a wide variety of applications. These baths can be used effectively in molecular biology protocols (such as hybridization), bacterial culturing, as well as in solubility and metabolism studies. The MRC Models WS17 and WS27 Reciprocating Water Baths are designed to deliver precise temperature control and a smooth reciprocal shaking motion.

The oscillator control is independent, allowing the baths to also be used for regular constant temperature water bath applications such as thawing, warming reagents, or general incubation. Both the WS17, and WS27 Shaking Water Baths offer an adjustable stroke length ( 0.5", 1" or 1.5"), giving the user the ability to affect the degree of agitation. With a RPM range of 20-200, these versatile reciprocating water baths are sure to meet many application needs

**Features:**

- Independent Oscillation and Temperature Controls.
- Adjustable Stroke Length.
- Platform Tray Included.
- Recessed Heating Element Prevents "Burnout".
- Unique Design Eliminates "Hot Spots".
- Cover Included.

**Precise Temperature Control:**

- Over Temperature Protection.
- Temperature Uniformity +/- 0.2% at 37°C.
- Temperature Range Ambient + 5°C to 80°C.

**Applications:**

- Hybridization Applications.
- Cell Cultures.
- Cell Aeration.
- Increasing Solubility Rates.
- Molecular Biology Assays.
- Bacterial Cultures.

Model	WS17-2	WS27-2
<b>Exterior Dimensions (wxdxh)</b>	64.8 x 39.4 x 31.8 cm	95.3 x 37.5 x 31.8 cm
<b>Bath Tank Dimensions (wxdxh)</b>	37.4 x 29.8 x 19.0 cm	68.5 x 30.4 x 18.4 cm
<b>Tank Capacity</b>	17L	27L
<b>Stainless Steel Gable Cover(s)</b>	One Included	One Included

Part Number	Flask Size	WS17-2	WS27-2
111-1-111050	50 ml	24	48
111-1-111125	125 ml	24	48
111-1-111250	250 ml	12	24
111-1-111500	500 ml	6	12
111-1-1111000	1000 ml	4	8
111-1-1112000	2000 ml	2	4
111-1-1113000	2.8 Liter	1	3
111-1-1114000	4 Liter	1	2
111-1-1115000	6 Liter	1	2
111-1-1116000	2.8 Liter	1	3

**WBT-450/550/551, Digital Precise Shaking Water Bath, 45 Liter, Digital PID Control, Orbital Motion, 20~250 or 400 rpm, to 75°C or 100°C, ±0.1°C, up to 3 Liter Flask**



**WBT-450**

**Electronically Controlled Shaking Mechanism Provides Quiet Reciprocating Motion and Precise Speed Control.**

**Features:**

- Stainless Steel Bath for Superior Durability & High Thermal Efficiency.
- Innovative Easy-to-Use Digital PID Controller.
- Electronically Controlled Shaking Mechanism Provides Quiet Reciprocating Motion & Precise Speed Control.
- Patent shaking mechanism: minimum noise & vibration.
- Ideal for a wide range of laboratory applications requiring controlled temp with orbital shaking motion
- Suitable for long time operation up to weeks and months
- Separate switches for speed ON/OFF & heater ON/OFF
- Individual readout for RPM & digital readout for temp.
- All stainless steel inner tank, platform & clamps
- Maintenance-free induction brushless motor
- Differential clamps available
- Microprocessor based on PID temperature control
- Speed & temperature adjustable.



**WBT-550**



**WBT-550**



**WBT-551 Cooled Bath**

Model	WBT-450	WBT-550	WBT-551
Speed	10-250 rpm	20-400 rpm	20-200 rpm
Orbit diameter	25 mm	12.5 mm	Reciprocating
Speed readout	Tachometer	Digital	Digital
Temperature control	PID	PID	PID
Temperature readout	Digital		
Working temperature range	Ambient +5°C~75°C	Ambient +5°C~100°C	-10°C to +100°C
Stability	±0.2°C	±0.2°C	
Power watts	1200W		
Optional accessory	Gable cover		
Timer	No	999min / 999hr	
Platform	450x290	485x320	400x300
Inner tank size WxDxH (mm)	560x405x200	600x420x200	605x360x190
Size WxDxH (mm)	740x530x450	725x565x530	840x415x690

Capacity of flask	50ml	125ml	250ml	500ml	1000ml	2000ml
WBT-450/550/551 number of flasks	35	24	15	12	6	2

**OBH Series, High Temperature Bath Circulator, 7 & 18 Liter, Digital Control, Powerful Circulation Pump, Up To 200°C/300°C**



**Powerful Circulation Pump Ensures Temp. Uniformity: Internal & External Circulation (optional)**

Robust design using high grade stainless steel inside and outside the bath. Heating Circulators with stainless steel bath tanks are mainly used for internal and external temperature tasks. The range of these models have 2 capacities, allowing for temperature application of larger external systems, as well as open systems. Simultaneous temperature applications of smaller objects can also be carried out directly in the internal bath of the circulator.



**External Circulation Option OBH-071**

**Features:**

- 3 Models with choice of temperature range and bath capacity
- Stainless steel bath and lid for superior durability and high thermal efficiency.
- Over heating safety device is equipped.
- Wide range of temperature control.
- Digital temperature setting & readout.
- External circulating pump is available on special order.

Model	OBH-070	OBH-180	OBH-183
Model (External Circulation)	OBH-071	OBH-181	OBH-184
<b>Working range</b>	Ambient +5°C~200°C		Ambient +5°C~300°C
<b>Stability</b>	±0.1°C		
<b>Setting/Readout</b>	Digital		
<b>Heater</b>	1.2KW		
<b>Stirring</b>	By built-in circulation pump		
<b>Volume</b>	7 Liter	18 Liter	12 Liter
<b>Operations</b>	W19.5xD23.5xH15cm	W39.5xD29.5xH15cm	W30xD30xH20cm
<b>Overall</b>	W54xD34.5xH38cm	W73xD39xH36cm	W66xD40xH42cm
<b>Power source</b>	110/220V 50/60Hz 13A/6.5A		



**VBH-Series, Kinematic Viscometer Bath**

**Digital Precise Viscosity Bath, 16 Liter or 24 Liter. With Transparent Window, Stainless Steel Lid for Viscometer Holder, Digital PID Control System, up to 150°C, ±0.1°C.**

Used for Precise Measurement with Capillary Viscometers • Innovative Easy-to-use Digital Controller PID • Powerful Circulation Pump ensures Highest Uniformity of Temperature • Stainless Steel (#304) made inner bath • Optional 0.01°C accuracy.

Model	VBH-150	VBH-152
<b>Temp. range</b>	Ambient +5°C~150°C	
<b>Temp. controller</b>	P I D control	
<b>Stability</b>	±0.1°C	
<b>Timer delay on/off</b>	0~9999 min or 0~9999 hr	
<b>Reservoir (mm)</b>	W330xD150xH320	W490xD150xH320
<b>Volume</b>	16 Liter	24 Liter
<b>Overall (mm)</b>	W505xD250xDH550	W665xD250xDH550
<b>Operation (mm)</b>	W200xD140	W360xD140
<b>Window (mm)</b>	W160xD250	W320xD250
<b>Power source</b>	110/220V, 50/60Hz, 15/8A	



**WBH10-2**  
Water Bath



**WBH20-6**  
Water Bath

#### **WBH10-2/WBH20-6/OBH-502, scientific magnetic stirrer**

- 2/6 Individually stirring positions.
- Microprocessor based PID controller.
- Stirrer accommodates vessels up to 1L.
- Stirring speed adjustable from 300 to 1500rpm (Medium solution: water)
- Digital dual display both present temperature and setting value.
- Wide control range, bath can be combined with cooler to obtain below ambient temperature.
- Audio and Visual Temperature Anomaly Alarm and Cut-off (Range is adjustment.)
- Overheating safety device is equipped.
- Digital timer can be set from 0 to 9999 (min/hr), and power preset On/Off function.
- Built-in immersion circulation pump uniform the medium temperature in tank.
- Stirrers mixture the solution in vessels placed in the tank.
- Stainless Steel SUS#304 inner tank, and powder coated steel outer shell.



**OBH20-6** Oil Bath

Model	WBH10-2	WBH20-6	OBH20-6 (oil)
<b>Tank Capacity</b>	10 Liters	20 Liters	20 Liters
<b>Temperature working range</b>	Ambient +5°C-100°C		Ambient +5°C-200°C
<b>Stability (at 37°C)</b>	±0.1°C		
<b>Stirring</b>	By built-in immersion circulating pump		
<b>Magnetic stirrer</b>	2 position (individual control)	6 position (individual control)	
<b>Heater</b>	1.2 KW		
<b>Standard Accessory</b>	Gable cover		
<b>Internal Dimension (mm)</b>	W295 x D235 x H150	W495 x D295 x H150	W495 x D295 x H150
<b>Overall Dimension (mm)</b>	W345 x D285 x H320	W545 x D335 x H320	W770 x D395 x H370
<b>Power Source</b>	110V/220V 50Hz/60hz		





### MRC Beads:

MRC beads by design, provide a concurrent thermal and antimicrobial activity that efficiently shields the lab and personnel from invading organisms while thermally heating and cooling like water in any standard water bath or heat block.

- Compatible with standard constant temperature water baths; Tub with 4–8 inches depth is best
- Accepts and supports any size and shape vessel
- Compatible with a broad temperature range from  $-80^{\circ}\text{C}$  to  $180^{\circ}\text{C}$
- Cleans with mild soap, water and 70% ethanol solution.

### MRC Bead Baths:

The Bead Bath's eco-friendly, state-of-the-art design takes full advantage of the robust properties of MRC Beads. It delivers exceptional temperature uniformity and gets up and running faster. So you can do things with this bath that you can't do with your old water bath. You aren't limited to water tight containers, so you can safely incubate multi-well plates, petri dishes, and open-top samples at any angle.

- Thermal Uniformity: At  $37^{\circ}\text{C} \pm 1.0^{\circ}\text{C}$
- Temperature Range:  $5^{\circ}\text{C}$  above ambient to  $80^{\circ}\text{C}$ .

**M706–6L/M706, Bead Baths:** 74309–706 – 6L Bead Bath with 5L Beads: 110v, type "B" plug. Our Digital Baths are durable, dependable and are available with a variety of safety and convenience.

**M714–14L/M714, Bead Bath with Beads:** 14L Bead Bath: 110v, type "B" plug. Bead Baths are durable, dependable and are available with a variety of safety and convenience.

**M720–20L/M720, Bead Bath with Beads:** Our Digital Baths are durable, dependable and are available with a variety of safety and convenience.

### M700-Series, Bead, waterless Baths

**Save Time & Money:** Using Beads makes lab experiments easy. No more hassles with emptying, cleaning, and refilling water baths. The bath always stays on, so you don't have to plan around warm-up times. Use Beads in ice buckets and save trips to the ice machine. And no more floating samples.

**Stays Clean:** Unlike water baths and ice machines that promote harmful microbial growth, Beads keep things dry and unfriendly to microbes. So there is less to clean and less to worry about. The result is more successful experiments and less laboratory downtime.

**Stay Organized:** Beads hold things in place without accessories. So no more accidents from float away vessels. In fact, Beads aren't limited to capped, watertight vessels. Imagine using petri dishes and 96-well plates right in a Bead Bath. No water. No problem.

**Eco-friendly:** Beads can transform a water bath into a greener instrument. Beads don't require the use of harmful germicides to keep clean, they use less electricity because the Beads don't evaporate, and the Beads are completely recyclable.

**Walk about Tray:** It's a quarter the size of a traditional lab bucket. This makes it easy to use under the hood or in tight bench top spaces. With its superior insulating properties, it keeps your samples and reagents at temperature after removing them from the Bead Bath, Chill Bucket, or the refrigerator.

**Chill Bucket:** The Chill Bucket is a revolutionary laboratory ice bucket that works without ice. It chills while keeping everything dry and in place, so you no longer have to worry about watery meltdowns or losing track of your samples. It substitutes for an ice bucket and maintains temperatures of  $-20^{\circ}\text{C}$  to  $8^{\circ}\text{C}$  for up to 8 hours.

**Bead Block:** Bead Blocks replace common solid, drilled-out aluminum blocks in dry bath instruments. They eliminate the need for using multiple different size blocks to fit different sample vessels. Two sizes available in five colors. Temperature range from  $-80^{\circ}\text{C}$  to  $200^{\circ}\text{C}$  (beads & blocks).

**DryTemp:** The DryTemp is no ordinary dry bath. It's not designed around a solid block, but around MRC Beads for better flexibility and performance. Multitasking is smoother, experiments get done faster, and everything just works better. The temperature range is  $5^{\circ}\text{C}$  above ambient to  $150^{\circ}\text{C}$ .

### Features:

- Microprocessor control
- Over temperature protection
- Stainless body and lid.

Model	M706–6L	M706	M714–14L	M714	M720–20L	M720
Weight (Kg)	10	20	14	38	17	45
Capacity	5 Liters		12L		20L	
Interior Dimensions WxDxH (cm)	30.5x15.2x15.2		30.5 × 30.5 × 15		15.2 × 30.5 × 15.2	
Exterior Dimensions WxDxH (cm)	40.4x31.2x21.6		40.5 × 40.5 × 20.9		40.4 × 47 × 21.6	
Temperature Range	Ambient $+5^{\circ}\text{C}$ to $80^{\circ}\text{C}$					
Temperature Uniformity	$\pm 1.0^{\circ}\text{C}$		At $37^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$	$\pm 1.0^{\circ}\text{C}$	$\pm 1.0^{\circ}\text{C}$	

### BR250, Video Borescope/Wireless Inspection Camera

9mm camera diameter and 3.5" Color TFT LCD Wireless Monitor With optional Wireless USB Video Receiver (BRD10) to stream live video to your PC & over your VOIP (Voice Over Internet Protocol) connection.



BRD10 – Optional Wireless USB Video Receiver allows user to stream live video to a PC and also can be remotely viewed via VOIP connection.

- Detachable wireless color display can be viewed from a remote location up to 32ft (10m) from measurement point.
- 2GB microSD memory card (included) for capturing images (JPEG) or video (AVI) for viewing on your PC.
- Captured video and still images with date/time stamp can be played back on the wireless monitor or your PC.
- 9mm diameter camera head with 39" (1m) flexible gooseneck cable
- Video and images can also be transferred to your PC via the microSD card (with included SD adaptor) or USB cable (included) and viewed using Windows® Multimedia Player.
- Menus in 10 languages: English, Chinese, German, French, Spanish, Portuguese, Italian, Japanese, Dutch & Russian.
- Mini water-proof (IP67) 9mm camera head for high resolution viewing.
- Four bright LED lamps with dimmer to illuminate viewed object.
- Glare-free close-up field of view.
- Optional BR200-EXT extension cable available for increasing viewing depth; 19mm diameter connector and 37" (0.95m) cable length; maximum 2 extension cables can be connected to the borescope.

Model	BR250
<b>Camera</b>	
Pixels	712 x 486 (NTSC)
Transmission Frequency	2.4GHz
Transmission Range	32ft (10m) unobstructed view
Viewing direction	Viewing Angle 45°
Focus distance from object	5.9" to 9.8" (15 to 25cm)
Shaft diameter	9mm
Working length	36" (0.9m)
Minimum bend radius	2.36" (60mm)
Handle Dimensions	7.3 x 5.7 x 1.6" (186 x 145 x 41mm)
Weight	18.7oz (530g)
<b>Monitor</b>	
LCD Screen Type	3.5" TFT
Pixels	320 x 240
Video Output Level	0.9 to 1.3M750
Frame Rate	10, 15, 20, 25, 30FPS
Video Resolution	960 x 240 (avi format)
Image Resolution	640x 480 (jpeg format)
Monitor Dimensions	3.9 x 2.7 x 1" (100 x 70 x 25mm)
Operating/Charge Time	1.5 hours/3 hours
Weight	4.9oz (140g)

**Ordering Information:**













Complete with 4 AA batteries, rechargeable display battery, micro SD memory card with SD adaptor, USB cable, extension tools (mirror, hook, magnet) video interconnect cable, AC adaptor (100-240V, 50/60Hz), magnetic base stand, and hard case.



**Ideal Applications:**  
 - Water Restoration  
 - HVAC and Refrigeration  
 - Electrical inspection  
 - Automotive  
 - Pest control



Detachable wireless 3.5" color TFT LCD display can be viewed from a remote location up to 32ft (10m) from the measurement point.

Ordering, Optional Probes			
 <b>BR250</b>	Flexible Video Borescope (9mm diameter/1m cable)	 <b>BR200-EXT</b>	Borescope Extension Cable for BR250 (19mm diameter/0.9m cable)
 <b>HDV620</b>	Wireless USB Video Receiver	 <b>UA100-BR</b>	Universal AC Adaptor (100-240V/m 50/60Hz) for BR200 and BR250 (Note: Recommended up to two BR200-EXT connected to BR250 to maintain resolution)
 <b>BR-9CAM</b>	Replacement 9mm Borescope Camera Head with 1m Cable	 <b>BR-17CAM</b>	Replacement 17mm Borescope Camera Head with 1m Cable
 <b>BR-9CAM-2M</b>	Replacement 9mm Borescope Camera Head with 2m Cable	 <b>BR-17CAM-2M</b>	Replacement 17mm Borescope Camera Head with 2m Cable
 <b>BR-9CAM-5M</b>	Replacement 9mm Borescope Camera Head with 5m Cable	 <b>BR-17CAM-5M</b>	Replacement 17mm Borescope Camera Head with 5m Cable



### HDV600, Series High Definition VideoScope Inspection Cameras

Narrow diameter cameras with 5.7" High Definition Color LCD Monitor deliver high image and video resolution on large color display

- The HDV600 Series VideoScope has various camera probes to fit your application needs. Choose from a range of sizes with articulating or wireless features.
- 5.7" color LCD TFT – high definition 40x480 pixels resolution
- Waterproof (IP67) meter and camera head (IP57) with cable.
- Bright white LED lamps with dimmer to illuminate viewed object.
- Glare-free close-up field of view and 6" (15.2cm) minimum focus distance.
- 2G SD memory card included to store >14,600 images.
- Video recording (up to 4 hours) with Voice annotation.
- Video and images can be transferred via the SD card, USB output or AV out.
- An optional wireless transmitter (HDV-WTX) connects to your camera cable and allows you to transmit video up to 100ft (30m).
- 1 year warranty.
- Complete with SD memory card, 3.7V rechargeable Li-Polymer battery, AC adaptor, USB and AV cables, camera with cable and case.

#### Model HDV610

- VideoScope with 5.5mm diameter camera head (1m flexible cable).

#### Model HDV620

- VideoScope with 5.8mm diameter camera head (1m semi-rigid cable retains configured shape).

#### Model HDV640 & HDV640W

- VideoScope with 6mm diameter camera head (1m semi-rigid cable retains configured shape).
- Easy knob control of the articulating camera tip facilitates viewing in obstructed areas where standard camera tips cannot access.
- 320° camera probe rotation (from straight position, 160° left and 160° right).

#### Model HDV640W





- Built-in wireless transmitter in camera cable controller allows you to transmit video up to 32ft (10m) from the measurement point to your monitor.

















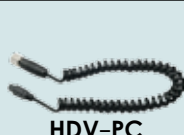


- A. USB input
- B. Microphone input
- C. SD card slot
- D. AV out
- E. Reset switch
- F. Power adaptor input

#### Unlimited Inspection Uses:

- Home: Mold, insect infestation, electrical wire or plumbing.
- HVAC: Ducts, motors, compressors, air movers, and chillers.
- Automotive: Engines, transmissions, motors, electronics.
- Government: Safety and security.
- Industrial: Welding, process equipment, gears, molding machines.
- Aerospace: Aircraft, debris, cracks or other damages

Ordering			
Video Inspection Camera Kits			
 <p><b>HDV610</b></p>	<p>High Definition VideoScope (5.5mm diameter camera/1m flexible cable)</p>	 <p><b>HDV640</b></p>	<p>High Definition Articulating VideoScope (6mm diameter camera/1m semi-rigid cable)</p>
 <p><b>HDV620</b></p>	<p>High Definition VideoScope (5.8mm diameter camera/1m semi-rigid cable)</p>	 <p><b>HDV640W</b></p>	<p>High Definition Wireless Articulating VideoScope (6mm diameter camera /1m semi-rigid cable)</p>

Video Inspection Monitor			
 <p><b>HDV600</b></p>	<p>High Definition VideoScope (meter only)</p>		
Optional Camera Heads			
 <p><b>HDV-TX1</b></p>	<p>6mm Articulating VideoScope Camera Head (1m Semi-Rigid Cable)</p>	 <p><b>HDV-TX2</b></p>	<p>6mm Articulating VideoScope Camera Head (2m Semi-Rigid Cable)</p>
 <p><b>HDV-WTX1</b></p>	<p>6mm Wireless Articulating VideoScope Camera Head (1m Semi-Rigid Cable)</p>	 <p><b>HDV-WTX2</b></p>	<p>6mm Wireless Articulating VideoScope Camera Head (2m Semi-Rigid Cable)</p>
 <p><b>HDV-4CAM-1FM</b></p>	<p>4mm VideoScope Camera Head with Macro lens (1m Flexible Cable)</p>	 <p><b>HDV-5CAM-3R</b></p>	<p>5.8mm VideoScope Camera Head with long depth of field (3m Rigid Cable)</p>
 <p><b>HDV-5CAM-1FM</b></p>	<p>5.5mm VideoScope Camera Head with Macro lens (1m Flexible Cable)</p>	 <p><b>HDV-5CAM-3RM</b></p>	<p>5.8mm VideoScope Camera Head with Macro lens (3m Rigid Cable)</p>
 <p><b>HDV-5CAM-3F</b></p>	<p>5.5mm VideoScope Camera Head with long depth of field (3m Flexible Cable)</p>	 <p><b>HDV-25CAM-10G</b></p>	<p>25mm VideoScope Camera Head (10m Fiberglass Cable)</p>
 <p><b>HDV-5CAM-3FM</b></p>	<p>5.5mm VideoScope Camera Head with Macro lens (3m Flexible Cable)</p>	 <p><b>HDV-25CAM-30G</b></p>	<p>25mm VideoScope Camera Head (30m Fiberglass Cable)</p>
 <p><b>HDV-5CAM-10F</b></p>	<p>5.5mm VideoScope Camera Head with long depth of field (10m Flexible Cable)</p>	 <p><b>HDV-WTX</b></p>	<p>Wireless Transmitter</p>
 <p><b>HDV-5CAM-1RM</b></p>	<p>5.8mm VideoScope Camera Head with Macro lens (1m Rigid Cable)</p>	 <p><b>HDV-PC</b></p>	<p>Spare Patch Cable for HDV Series</p>

### 1 Liter Laboratory Blenders



**800G/S** –  
Capacity: 1 Liter/1.2 Liters  
Switch Settings: one speed  
Base: Die cast epoxy coated base  
Container: Stainless steel with handle and two-piece vinyl and styrene lid – 800S.  
Heat-resistant glass with handle and two-piece vinyl and styrene lid – 800G.  
Overall height: (35.5/40.5cm).

**8011G/S** –  
Capacity: 1 Liter/1.2 Liters  
Switch Settings: two speed  
Base: Die cast epoxy coated base  
Container: Stainless steel with handle and two-piece vinyl & styrene lid – 8011S.  
Heat-resistant glass with handle and two-piece vinyl and styrene lid – 8011G.  
Overall height: (38/40.5cm).

**8010G/S** –  
Capacity: 1 Liter/1.2 Liters  
Switch Settings: two speed, 3 minute mechanical timer  
Base: Die cast epoxy coated base  
Container: Stainless steel with handle and two-piece vinyl and styrene lid – 8010S.  
Heat-resistant glass with handle and two-piece vinyl and styrene lid – 8010G.  
Overall height: (38/40.5cm).

**LB20EG/S** –  
Capacity: 1 Liter/1.2 Liters  
Switch Settings: Variable speed 0 – 20,000 RPM, for mixing, stirring, blending, or homogenizing  
Base: Die-cast epoxy coated base  
Container: Stainless steel with handle and two-piece vinyl and styrene lid – LB20ES.  
Heat-resistant glass with handle & two-piece vinyl & styrene lid – LB20EG.

Model	Container Replacement	Rated Amps	Rated Volts	Peak HP	No-Load RPM
<b>800S</b>	S.S. CAC33	1.8	230 volts, 50/60 Hz	.40	High 22,000
<b>800G</b>	Glass CAC32	1.8		.40	
<b>8010S</b>	S.S. CAC33	1.8		.40	Low 18,000 High 22,000 +Timer
<b>8010G</b>	Glass CAC32	1.8		.40	
<b>8011S</b>	S.S. CAC33	1.8		.40	Low 18,000 High 22,000
<b>8011G</b>	Glass CAC32	1.8		.40	
<b>LB20ES</b>	S.S. CAC33	1.5		.40	Variable Speed 0 – 20,000
<b>LB20EG</b>	Glass CAC32	1.5		.40	

## Specialty Containers and Accessories

Please note that container assemblies are not autoclavable in normal configuration, as washers & seals will eventually break down. Two-piece lids are also not autoclavable.

**CAC32, 1.2Liter Glass Container**

- Heat-resistant glass with handle and two-piece vinyl styrene lid.

**CAC19, 1.4Liter Container**

- Polycarbonate container complete with lid and blending assembly.

**CAC33, 1Liter Stainless Steel Container**

- Stainless steel container with handle, two-piece vinyl and styrene lid, and blending assembly.

**CAC64, 500 ml Container**

- 500ml polypropylene container, screw cap and standard blending assembly.

**SS10, Pulverizer Stainless Steel Container**

- Stainless steel base
- Snap-tight medical grade Plastisol lid
- 75 gram dry capacity
- Reduces 10 grains of tablets to dust in 10 seconds at 20,000 RPM
- Fits all 1-Liter laboratory blenders.

**S115, Dry Blending Container**

- Stainless steel container and one-piece stainless steel lid & knob
- Stainless steel base
- Unique blade for dry homogenizing and pulverizing
- 500 ml approximate working capacity
- Some substances require use of adapter and large motor units (example: soil processing requires use of 4-Liter base & AD1 adapter).

**SS510S, One-Liter Sealed Cover Container**

- Stainless steel container with O-ring type gasket for positive sealing of cover
- Cover has stainless steel plug for sampling
- Fits all 1-Liter laboratory blenders.

**SS515, One-Liter S.S. Container**

- 1-Liter stainless steel container and one-piece stainless steel lid
- Standard blending assembly with teflon gaskets
- Fits all 1-Liter laboratory blenders.

**SS610, One-Liter S.S. Container**

- 1-Liter stainless steel container, same as CAC33 except has one-piece stainless steel lid and knob
- Fits all 1-Liter laboratory blenders.

**SS510C, One-Liter Cool Base Container**

- 1-Liter stainless steel container
- Unit is complete with one-piece stainless steel lid
- Fits all 1-Liter laboratory blenders.

**SS510F/SS610F, One-Liter Foam Arrestor**

- Adjustable baffle used to reduce foam in media
- SS510F fits SS515 and SS510C
- SS610F fits SS610 and standard 1-Liter stainless steel containers with handles
- Comes complete with cover and gasket.

**SS510T/SS610T, 1-Liter Temperature Control Coil**

- Stainless steel coil for use in 1-Liter stainless steel containers
- Water circulated through helical coil cools media being processed
- Comes complete with cover and gasket
- SS510T fits SS515 and SS510C
- SS610T fits SS610 and standard 1-Liter stainless steel containers with handles.

**MC1/MC2/MC3, Mini Containers**

- Stainless steel containers and base for processing small quantities
- Standard blending assembly with stainless steel blade
- Snap-tight medical grade Plastisol lid
- Three sizes: MC1 (12-37ml), MC2 (37 - 110 ml), and MC3 (50 - 250 ml).

**Blade Assemblies with Teflon Washers for Mini Containers:**

- 501699 – Blade assembly for MC1
- 501700 – Blade assembly for MC2
- 501701 – Blade assembly for MC3

#### HGB-550, 2 Liter Laboratory Blender



HGB-550

Please note that container assemblies are not autoclavable in normal configuration, as washers & seals will eventually break down. Two-piece lids are also not autoclavable.

- Heavy-duty 1.5 HP motor
- 2 speeds – Lo (19,000 RPM), Hi (23,000 RPM)
- Stainless steel 2 Liter container: HGB550-230VAC, 50/60Hz, Non-CE. HGB55E-230 VAC, 50Hz, CE
- Polycarbonate 2Liter container: HGB500-230VAC, 50/60Hz, Non-CE. HGB50E-230 VAC, 50Hz, CE.



#### SS810, 2 Liter S.S. Container

- 2Liter stainless steel container and handle
- One piece stainless steel lid & knob
- Fits all 2Liter MRC laboratory blenders.



#### CAC21, 1.4 Liter Container

- Polycarbonate container complete with lid & blending assembly.



#### CAC31, 2 Liter S.S. Container

- 2Liter stainless steel container and handle
- Two piece lid
- Fits all 2Liter MRC laboratory blenders.



#### SS715, 1 Liter Stainless Steel Container

- Stainless steel container complete with polystyrene lid and blending assembly.



#### CAC59, 2 Liter Container

- Polycarbonate container complete with lid & blending assembly.



#### CAC69, Clutch Repair Kit

- Clutch repair kit for 2-Liter blenders – 2 pack.



#### AD2, 2Liter Adapter

- Allows use of 1Liter and smaller containers on 2Liter motor units.



#### CAC15, Hot Blending Lid

- Hot blending lid for 2-Liter stainless steel blender containers only.



MX1000TXEE

#### MX1000TXEE, Hi-Power Blender

- Heavy-duty 3½ peak HP motor
- 32,000 RPM bare motor speed, 1500 watts
- Simple High, Low, Off and Pulse paddle switches
- One-piece dishwasher-safe removable jar pad
- 2-Liter BPA-free copolyester container
- 230 VAC, 50 Hz, 6.5 amps
- CE, RoHS
- Also available in 60 Hz.

#### MX1100TXEE, Hi-Power Blender with Timer

- Heavy-duty 3½ peak HP motor
- 32,000 RPM bare motor speed, 1500 watts
- Easy-to-clean electronic membrane keypad with simple On/Off, High, Low, Stop and Pulse controls
- 30-second electronic countdown timer
- One-piece dishwasher-safe removable jar pad
- 2-Liter BPA-free copolyester container
- 230 VAC, 50 Hz, 6.5 amps
- CE, RoHS
- Also available in 60 Hz.



MX1100TXEE



#### SE1000, Large Sound Enclosure

- Retro-fits all blenders in MRC Commercial Xtreme Series — Half-Gallon Jars.



#### CAC90I, Stainless Steel Containers

- 2-Liter stainless steel container.





**24CB10C, 4 Liter Laboratory Blender**

- **The Standard in Handling.** provides two handles for safer, easier lifting, pouring and carrying.
- **The Standard in Long Service.** sealed, precision, high-tech ball bearing system extends the life of our blenders.
- **The Standard in Design and Control.** Ergonomic classic design makes the unit easier to lift. Easy to clean electronic membrane control panel with Pulse Mode provides precision operation.
- **The Standard in Quiet Operation.** encases its industry-leading 3.75-HP motor for quiet operation.
- **The Standard in Stability.** Deeper, wider, full traction rubber non-skid feet keep the blender stable.
- **Capacity:** 4 Liters.
- **Switch Settings:** Off - Lo - Med - Hi - Pulse.
- **Base:** Die-cast gray epoxy coating.
- **Overall Height:** 26 inches
- **Weight:** Net shipping weight 38 lbs.
- Heavy-duty 3.75 HP motor
- Stainless steel 4-Liter container with 2 handles for increased safety & easier handling
- Low (15,800 RPM), Med (18,000RPM), Hi/Pulse (20,800RPM).

**501697**

- Blade assembly with carbon bearing and neoprene seals for 4-Liter blenders (not shown).

Please note that container assemblies are not autoclavable in normal configuration, as washers & seals will eventually break down. Two-piece lids are also not autoclavable.



**CBL10, Hot Blending Lid**

- Polycarbonate Hot Blending Lid for 4-Liter blender.



**AD1, 4 Liter Adapter**

- Allows use of 1Liter and smaller containers on 4Liter motor units.



**2610T, 4 Liter Temp. Control Coil**

- Stainless steel coil for use with 2610C or standard 4-Liter CAC70 containers

- Water circulated through helical coil cools media being processed
- Comes complete with cover and gasket.



**2610F, 4 Liter Foam Arrestor**

- Adjustable baffle used to reduce foam in media
- For use with 2610C or standard 4-Liter CAC70

- containers
- Comes complete with cover & gasket.



**2610C, 4 Liter Cool Base Container**

- 4Liter stainless steel container with jacketed base,

- allowing for water cooling of bearing during extended operation periods
- Unit does not include lid or cover gasket.



**CAC72, 4 Liter Container**

- 4Liter stainless steel container with 2 handles & polycarbonate lid.



**CAC70, 4 Liter Container**

- 4Liter stainless steel container with 2 handles & stainless lid.



**DMX20M/DME20E, Lab Mixers**

- Two speeds: High 20,000 RPM, Low 15,000 RPM
- Commercial motor/durable housing/shock resistant rubber mounts
- Lifetime sealed ball bearing
- Easy to clean removable front panel
- Two agitators included: butterfly agitator and solid agitator
- 28-ounce (0.83-Liter) stainless steel container included
- Switch settings: Off-On-Pulse
- Rating: 230 volts - 50/60Hz - .5 Amps
- UL, NSF (DMX20M); CE (DM20M).



**CAC20, Mixer Container**

- Stainless steel container 20-ounce/ 0.83-Liter capacity



**CAC08, Butterfly Agitator**

- Stainless steel agitator

**CAC09, Solid Agitator with Screw**

- Stainless steel agitator



- Capacity: 1 Liter
- Switch Settings: Two-speed switch available as an accessory – BHL515
- Container: 1 Liter stainless steel with stainless lid available separately– HL515
- Cord: not included. Must be hard-wired via explosion-proof conduit
- Overall height: 37.5 cm
- Weight: 19 lbs. (8.62k)UL Listed for use in Class 1, Group D hazardous locations.

**BHL240**

**HL515**, 1-Liter container, stainless steel/for BHL240  
**BHL515**, Two-speed switch for BHL240

### BHL240, Hazardous Location Blender Motor

#### The Standard in Safety

Depend on this blender to provide optimum safety and reliable performance when working with heat and/or highly volatile substances.

#### The Hazardous Location Blender (BHL240)

Heat is generated within motor housings during normal operation. This blender is designed to prevent the electrical arcing and generated heat from igniting ambient atmospheres. UL Listed.



#### HL515, 1 Liter Stainless Steel Container

- Stainless steel container and lid with special teflon seals and blending assembly for BHL240
- Please note that the BHL240 will lose Class D Explosion Resistant Rating if not used with this container.

Please note that container assemblies are not autoclavable in normal configuration, a washers & seals will eventually break down. Two-piece lids are also not autoclavable.

Model	Container Replacement	Rated Amps	Rated Volts	Peak HP	Motor & Blade	No-Load RPM	CE Cert.
<b>BHL240</b>	HL515, 1 Liter S.S.	4.0	230 volts, 50/60 Hz	.70	Single Phase	High 18,500	No



**8020 container**

**8017**

### 8017/8018, 4 Liter Explosion Proof Blender

MRC's Explosion-Proof Blender 8017 is designed for laboratory situations made hazardous by the blending of mixtures containing volatile solvents. Unit features a 1.5 hp explosion-proof motor with automatic reset thermal protection. The 8017 is designed to accommodate a MRC 4-Liter blending container (#8020 not included). The explosion-proof motor is UL approved (applies to motor only) for Class I, Group C and D and Class II, Group F and G operation. Model 8017 is a single-speed blender operating at 11,500 rpm. Model 8018 is a variable-speed version of the 8017. It will provide constant torque in a speed range from 1,150 to 11,500 rpm. Blender is powered by a PWM scalar drive and speed is monitored by a digital display. Although both blenders are designed to use a 4-Liter container, you can adapt unit to fit all Eberbach blending containers with the use of a Model 8051 adapter. Both Model 8017 and 8018 must be installed by a qualified electrician to preserve their explosion proof capability. Units are supplied without container, power switch or adapter.

#### Features:

- Blending speed - 8017: fixed@11500rpm  
8018: variable between 1150-11500rpm, displayed by digital output
- Optional power requirements - 8017: 230/460V, 50/60Hz three phase  
8018: 230V, 50/60 Hz, three phase
- Power requirements - 8017: 115/230V, 60Hz, 16.4/8.3Amps.  
8018: 230V, 50/60Hz, 16.4 Amps
- Blender motor - 8018/8017: explosion-proof single phase UL approved for Class I, Group D and Class II Group, F and G. Rated 1.5 hp
- Dimensions - Height: 18 in without container (45cm)  
Width: 10.4 in (26cm)  
Length: 20.4 in (52cm)
- Weight - 90 lbs (40kg)



STO-4

**STO-4, Stomacher Blender**

STO-4 stomacher is specifically used for microbial extraction. Updated with LCD display which shows running state like speed,time,program.

Support 5 type running program,each one can be settled by user.

This stomacher microbial extraction process has been found useful with a wide variety of samples, particularly: solid and semi-solid products, fresh and processed meat, dry fruits, cereals, grains, seeds, cheese, cosmetics, pharmaceutical products, and specimen tissues.



Blend and homogenize within sealed processing bags—eliminating cross-contamination and cleaning between samples

- Small footprint offers convenient placement on your lab bench
- Increase productivity—no need to clean equipment between processing, simply discard bags after use
- Paddle design processes materials that cannot be handled by conventional lab blenders.

The unique action of the Stomacher uses paddles to homogenize samples through a combination of crushing and stirring forces.

it can fit into safety cabinets to reduce your exposure to hazardous materials.

During operation, the curved paddles and an island baffle mold the bag contents into a tubular ring for vigorous stirring and circulation of the sample from top to bottom, extracting more organisms into suspension than any other blending process.

Model	STO-4
<b>Paddle speed</b>	3-12/s
<b>Volume</b>	50-400ml
<b>Paddle distance</b>	Absorbance photometry
<b>External size</b>	380x220x330mm
<b>Ambient temp. request</b>	0-35°C
<b>Net weight</b>	22kg
<b>power</b>	220V/50HZ or 110V 180W
<b>Homogeneous bag</b>	17 × 30cm

**Applications:** Food microbiology, biochemistry, & cell biology sample processing • Removal of viruses & bacteria from tissues and organs • Sterility testing of pharmaceuticals • Removal of organisms from tissue biopsies or fecal specimen.



IC70E

IC20

**IC-Series, Ice Crushers**

**IC70E**

- ½ HP motor
- Heavy-duty stainless steel crushing blades
- Brushed stainless steel exterior
- Large chute and funnel for easy feeding
- Container holds up to 2.8 Liters of crushed ice
- 240 VAC, 50 Hz, 1.5 amps
- CE, RoHS.

**IC20**

- Portable and compact
- Quiet heavy-duty motor
- Special height adjustment dispenses into 1-Liter or 1.4-Liter blender containers as well as a variety of other container sizes
- 2.4-Liter bowl and funnel included
- Large chute opening for safe, continuous ice cube feed
- 230 VAC, 50 Hz, 120 W, 0.5 amps
- CE, RoHS.



### WSB33E, Light Duty Immersion Blender

- 7" fixed shaft, 11.4-Liter capacity
- 2-speed fingertip control: Off-Hi-Lo
- High-efficiency motor
- All-purpose stainless steel blade
- 6-foot (183cm) cord with 2 prong plug
- 230 volts, 50 Hz, 0.4 amps
- CE, RoHS.

WSB33E



### WSB25XE, Quick Stick Xpress Cordless Immersion Blender

- 2-speed operation, 13,000 RPM on High
- 9.6 volt NiMH rechargeable battery pack
- Up to 30-minute run time on single charge
- High-speed wall-mountable recharging station
- Stainless steel 25.5 cm fixed shaft and blade
- 23-Liter capacity
- CE, RoHS.

WSB25XE



### WSBPPE, Power Pack

- Fits all heavy-duty Big Stix
- 230 VAC

### WSBPPE, Power Pack

- 25.5cm stainless steel whipping paddles
- Fits entire Big Stix Heavy-Duty Immersion Blender line
- User-replaceable coupling
- Die-cast gears for optimal performance
- CE, RoHS.



### WSB40E, Medium-Duty Quik Stix Plus

- ½ HP, 2-speed heavy-duty motor
- 25.5-cm fixed shaft
- Rubberized comfort grip
- All-purpose stainless steel blade
- 23-Liter capacity
- 230 volts, 50 Hz, 1.5 amps
- CE, RoHS.

WSB40E



### WSB01, Bowl Clamp

- for hands-free operation



### WSBBC, Wall Mount

- Wall-mounted hanger available for easy storage while unit is not in use.



WSB50E WSB55E WSB60E WSB65E WSB70E

### WSB50E/55E/60E/65E/70E, Heavy-Duty Immersion Blenders with Removable Shafts

- 1 HP heavy duty motor – 18,000 RPM on Hi
- Variable speed motor – 9 settings
- Rubberized comfort grip & second handle for safe & controlled operation
- Continuous ON feature
- All-purpose stainless steel blade
- Completely sealed stainless steel shaft is easily removable and dishwasher-safe
- 12-foot (365 cm) cord with 2 prong plug
- 230 volts, 50 Hz, 2.8 amps
- CE, RoHS.

Model	Description
WSB50E	12"/30.5cm removable shaft, 37.9Liter capacity
WSB55E	14"/35.6cm removable shaft, 56.8Liter capacity
WSB60E	16"/40.6cm removable shaft, 94.6Liter capacity
WSB65E	18"/45.7cm removable shaft, 132.5Liter capacity
WSB70E	21"/53.4cm removable shaft, 189.3Liter capacity



**WFP14SE**

**WFP14SE, 3.35-Liter Batch Bowl Processor**

- LiquiLock® Seal System
- High-performance 1 HP motor
- Included processing accessories:
  - Sealed, serrated S-blade (WFP14S1)
  - 5/64"(2 mm) slicing disc (WFP145)
  - 5/32"(4 mm) shredding disc (WFP144)
- Easy ON & PULSE/OFF control paddles
- Extra-large feed tube and pusher
- 230 VAC, 50 Hz, 2.6 amps
- CE, RoHS.



**WFP14S2, Batch Bowl**



**WFP14S3K, Batch Bowl Cover**



**WFP14S5K, Continuous-Feed Chute Cover**



**WFP14S4, Continuous-Feed Chute**



**WSG30E**

**WSG30E, Lab Grinder/Pulverizer**

- High-performance commercial-grade motor – 19,000 RPM
- Heavy-duty brushed stainless steel housing with safety interlock lid
- PULSE actuation to easily manage consistency of grind
- Includes 3 fully removable and dishwasher-safe stainless steel grinding bowls with convenient storage lids
- Durable stainless steel blades
- 230 VAC, 50 Hz, 175 W, 0.76 amps
- CE, RoHS.



**CAC-103**



**WCG75E**

**WCG75E, Chopper Grinder**

- Chopping assembly: 0.7-Liter work bowl, 2-blade hub, cover with 2 protected openings for adding ingredients while processing
- Grinding assembly: 0.7-Liter work bowl, 3-blade hub, sealed cover with handle
- Hi-speed 2-pole induction motor
- Bowl assemblies stack for storage
- 230 VAC, 50/60 Hz, 0.9 amps
- RoHS.





**FLAME-100**

## FLAME-100, Safety Bunsen

The safe alternative for all traditional Bunsen or alcohol burners!

### Multi-Use

The Flame 100 is ideally suited for all flame related applications in the laboratory. The 15 millimeter precision flame allows graduated heating of dental tools as well as safe sterilization of microbiological instruments. Flame size and intensity can be adjusted infinitely.

### Easy operation

The safety Bunsen burner Flame 100 activates immediately with the push of a button. No match or a pilot flame are required. Optionally, the Flame 100 can also be operated by a foot pedal\* or an external infrared motion sensor\*. The Flame 100 is suitable for stationary natural gas and propane/butane gas supplies as well as gas cartridges or gas cylinders. Numerous adapter systems are optionally available.

### Reliable safety

The proven Safety Control System (SCS) is also incorporated in the Flame 100. All potential hazards are constantly monitored and, if necessary, protective measures – such as the shutting off the gas supply – are activated. In addition to the ignition and flame control function and the overheating protection the safety package also features the continuous burner head control BHC. BHC unfailingly identifies burner head clogging by liquids or solid substances. Compared with a conventional Bunsen burner, the Flame 100 with the safety standard „SCS“ eliminates the risk of a gas leak or an explosion.

### Efficient

The Flame 100 is economical to operate and attractively priced for any laboratory, thus making savings for both your budget and the environment. Compared with traditional Bunsen burners, the gas consumption is reduced to a minimum, because the flame burns only when it is really needed. Compact and rugged. The housing and burner tube are made of stainless steel. The removable burner tube makes cleaning easy and the small footprint is an advantage for any lab bench.

### Flame 100 – for a safe flame in the laboratory!

- Flame without match
- Innovative safety technology
- Simple handling
- Cost-saving and environmentally friendly
- Minimum space required.

With button function Safety Control System (SCS )  
 With Burner Head Control (BHC) 2 standard Programs for button (function knob) and foot pedal  
 Removable burner tube  
 Holding device for 2 inoculation loop holders  
 Nozzles for natural gas, propane / butane gas  
 Wrench 17mm for gas connection  
 Tubing connector with swivel nut

Screwdriver for electrode holder, Switching power supply (global) Instruction manual and 2-year warranty  
 Stainless steel foot pedal optional: **6000402**



### Accessories:

- 6000406 External DoubleClick IR-Sensor**  
touch-free flame activation
- 6000402 Foot pedal**  
made of stainless steel
- 6000403 Mini Foot pedal**  
made of plastic
- 6000405 Benchtop switch**  
made of stainless steel
- 2000404RF RF-Stick radio set**  
stainless steel radio foot pedal (available in EU countries only)
- 2000600 Windshield**  
made of stainless steel
- 2000701 Adapter 360**  
for gas cartridges CV360
- 6000800 – 6000850 Safety adapter with pressure regulator & DVGW-tubing (0.5 m)**  
for gas cartridges
- 2000300 Tilt adjustment**  
made of stainless steel
- 2000200 Spray & Wax protector**  
with stainless steel base and glass cylinder
- 2000201**  
without glass cylinder

Model	FLAME-100
<b>Technology</b>	Microprocessor
<b>Programs</b>	Button: Start-Stop mit Ubetwachungs timer, 60 min Foot pedal: Standard (Flame during pressed foot pedal, Foot pedal optional)
<b>Safety features</b>	Safety Control System (SCS) with gas safety cut off: ignition & flame control temp. monitor, burner head clogging monitor (BHC) automatic unit switch off, 4 h
<b>Gas supply &amp; consumption</b>	Gas connection: 1/4" left with Gas filter Gas types: "2ELL3B/P: natural gas E/LL,18 – 25mbar. liquid gas, 20 – 50mbar Connected load: 48 g/h liquid gas Continuous cartridge operation: CV360-65min, CG1750-210min, (approx.) C206-230min, CP250-305min, CV470-550min, CV270-280min
<b>Temperature</b>	Flame temperature: 1200°C liquid gas, 1170°C on natural gas (E) Temp. threshold level: 0.66 kW liquid gas, 0.66 kW natural gas
<b>Electrical</b>	Power consumption: 2VA. Power connection: 100-240V / 50/60Hz / max. 0.3A, 9V DC / 1A
<b>Mechanical</b>	Burner tube: removable, stainless steel. Measurements (WXHxD): 89x34x88mm. Height with burner tube: 94mm. Weight: 385g.



FUEGO SCS BASIC

**FUEGO SCS-Series, provides maximum safety and highest convenience for all flame-related applications in the laboratory.**

**Simply safe to operate** Depending on the model, the Fuego SCS Series can be operated with wireless IR-Sensor, button function or foot pedal.

**Universal** The Fuego SCS Series can be operated with stationary natural gas and propane / butane gas supplies, cartridge gas or gas cylinders.

**Top-off-the-Line safety** The Safety Control System SCS © means state-of-the-art safety technology which constantly analyzes potential hazards and, if necessary, initiates safety measures, such as an interruption of the gas supply. In addition to the ignition and flame control functions and the overheating protection, the new safety package also features continuous burner head control (BHC). BHC unflinchingly detects burner head clogging by liquids or solid substances and ensures the correct assembly of the burner head.

Exceptional passive safety features: A residual heat display protects against burns. The automatic unit cut-off function prevents unintentional ignition of the flame when the burner has not been ignited for a longer period.

**Environment-conscious** Excellent energy efficiency in accordance with the most recent standards reduces gas and power consumption. This increases the burning time when gas cartridges are used.

**Robust** Fabricated entirely of stainless steel – from the controls to the gas connection – and with displays which are protected by heat resistant glass, the Fuego SCS Series withstands even extreme laboratory conditions.



FUEGO SCS BASIC-RF

**Fuego-SCS-Basic: More than standard**

The Fuego SCS basic can be safely operated by means of the supplied foot pedal or the button function. Different programs are available: a flexible start-stop function or the conventional foot pedal control for short-time applications. In addition, the flame can be started and stopped by briefly pressing on the function knob.

**Fuego-SCS-BasicRF: Wireless operation**

Wireless and safe flame sterilization! The "RF" model allows operation via radio foot pedal without a disturbing cable. Other than that, the Fuego SCS basic RF has the same functions and safety systems as the standard model Fuego SCS basic. The radio foot pedal is included in the range of delivery.

**Fuego-SCS-Digital: Versatile**

The Fuego SCS can be operated with the touch-free IR-Sensor, button function or foot pedal (optional). For all options, different programs exist that have been developed on the basis of practical experience: flexible start-stop functions, continuous application for up to 2 hours or programs for short flame sterilization – exact to the second.



FUEGO SCS BASIC-RF

Model	FUEGO-SCS BASIC	FUEGO-SCS BASIC-RF	FUEGO-SCS DIGITAL	FUEGO-SCS DIGITAL-Pro
<b>Programs</b>				
Button function	✓	✓	✓	✓
Pedal Standard	✓	✓	✓	✓
Pedal Start-Stop	✓	✓	✓	✓
Sensor Auto-Off			✓	✓
Sensor Start-Stop			✓	✓
Temp. Regulation			✓	✓
<b>Safety Control System with acoustic signals</b>	✓	✓	✓	✓
<b>Residual heat display</b>	✓	✓	✓	✓
<b>Animated graphic display</b>			✓	✓
<b>Foot pedal included</b>	✓	✓ (radio)		
<b>Single or DoubleClick IR-Sensor</b>			✓	✓
<b>Battery operation with tilt sensor</b>				✓
<b>Cooling reminder</b>			✓	✓
<b>Zero-pressure shut-down</b>			✓	✓
<b>Gas consumption display</b>			✓	✓
<b>2 user accounts</b>			✓	✓
<b>Gas inlet filter</b>	✓	✓	✓	✓
<b>Removable &amp; decomposable burner head</b>	✓	✓	✓	✓
<b>Housing, burner head, gas connection &amp; controls made of stainless steel</b>	✓	✓	✓	✓
<b>DVGW approved</b>	✓	✓	✓	✓



**FUEGO SCS DIGITAL**

**More convenience** The animated and high-contrast graphic display can be easily read under all lighting conditions due to the blue background illumination. The self-explanatory, language-less symbol menu facilitates a rapid selection of all functions. The display is not in your line of sight? Acoustic signals additionally aid the user.

**Innovative - The DoubleClick IR-Sensor** When activated, this additional safety function ensures that the burner can only be ignited by activating the DoubleClick IR-Sensor twice. The detection range and the time interval of the DoubleClick can be individually adjusted. As a result, unintentional ignition or ignition due to dropping or falling objects is virtually impossible, this increases safety considerably.

**Precisely adjusted** With the new temp. regulation system and an optional temperature sensor, the laboratory gas burner becomes a temperature-control station.

**Pressureless** The zero-pressure shut-down provides additional safety at the end of work. With it the residual pressure is released from the connection hose and the gas hose's service life is increased.

**Gas exhausted?** No new cartridge at hand? The new gas consumption display reminds you to have a fresh gas cartridge on hand in a timely manner.

**Flexible and individual** The Fuego has to 2 user accounts & saves all safety settings, burning times and other parameters for individual & flexible use.

**Cooled down** The precisely adjustable, exact to the second, cooling time reminder aids you in exactly complying with the required cooling period for inoculation loops.

**Properly connected!** Graphic installation and operating instructions at the first switch-on facilitate the initial start-up.

**Fuego-SCS-Digital-Pro:**

**Battery performance** The exclusive Fuego



**FUEGO SCS DIGITAL-PRO**

SCS pro provides maximum flexibility. Wireless operation using state-of-the-art rechargeable battery technology guarantees independent operation. Two standard rechargeable batteries allow up to 9 hours of continuous operation. This corresponds to approximately 2000 inoculation loop flaming operations. The Fuego SCS pro has an integrated fast charging function and can be recharged in only 3 hours. The range of functions is identical to those of the Fuego SCS.

<b>Technology</b>	Microprocessor, illuminated graphic display with acoustic signals as operating aids 2,3
<b>Programs</b>	IR-Sensor <sup>2,3</sup> : Start-Stop with timer, 1 sec - 2 h Auto-Off with timer, 0 sec - 2 h Foot pedal: Standard (flame during pressed foot pedal) Start-Stop with timer, Fuego SCS basic / Fuego SCS basic RF: 1 h Fuego SCS / Fuego SCS pro: 1 sec - 2 h Button: Start-Stop with timer, Fuego SCS basic / Fuego SCS basic RF: 1 h Fuego SCS / Fuego SCS pro: 1 sec - 2 h Temperature regulation <sup>2,3</sup> : with timer, 1 sec - 2 h temperature range from +35°C to +350°C
<b>Safety features</b>	Safety Control System (SCS) with gas safety cut off: ignition & flame control temperature monitor, burner head clogging and assembly monitor (BHC), tilt sensor (>90°) <sup>3</sup> Automatic unit switch off: Fuego SCS basic / Fuego SCS basic RF: 4 h Fuego SCS / Fuego SCS pro: 1 min - 2 h Residual heat display: indicates a hot burner head Zero-Pressure shut-off <sup>2,3</sup> : end of work procedure to lower the pressure in the supply hose
<b>Comfort functions<sup>2,3</sup></b>	cooling reminder gas consumption display for gas cartridges
<b>Gas supply and consumption</b>	Gas connection: 1/4" left with gas filter Gas types: I12ELL3B/P: natural gas E/LL, 18 - 25 mbar liquid gas, 20 - 50 mbar Connected load: 70 g/h liquid gas Continuous cartridge operation: CV 360 - 40 min, Express 444 - 50 min, CG 1750 - 150 min, C 206 - 170 min, CP 250 - 210 min, CV 470 - 370 min
<b>Temperatures</b>	Flame temperature: 1350°C on liquid gas, 1300°C on natural gas (E) Temperature threshold level: 1 kW liquid gas, 1kW natural gas
<b>Electrical</b>	Switching power supply: 100 - 240 V / 50/60 Hz / 0.3 A; 9 V DC / 1 A Power consumption: 2 VA IR-Sensor detection range <sup>2,3</sup> : 5 - 50 mm, adjustable DoubleClick IR-Sensor <sup>2,3</sup> : time range 0.5 - 2.5 sec (adjust. / disengageable)
<b>Technical Data Battery Operation<sup>3</sup></b>	Type rechargeable battery: NiMH 2.4V (2 x Mignon (AA), 1.2V, 2600mAh) Operating time: up to 9 hours continuous operation Charging time: 90% / 3 hours Charging current: 700mA
<b>Radio Frequency System<sup>1</sup></b>	Safety standard: MRC safety radio protocol Range: 2 - 5 m Frequency: 2.4 GHz Channels: 253 Batteries foot pedal: 2 x AA (Mignon) Life time batteries (foot pedal): approx. 2000 hours (operation 8 hours per day: > 1 year)
<b>Mechanical</b>	Casing and operating controls: stainless steel / glass, UV and solvent resistant Burner head: removable and decomposable, stainless steel Cover of burner shaft: Ø 23 mm, with drains Dimensions (w x h x d): 103 x 49 x 130 mm Weight: 700 g



Model	Fuego SCS Basic	Fuego SCS Digital
<b>Technology</b>	Microprocessor	Microprocessor, LC-display
<b>IR-Sensor</b>	Start-stop with timer~2h, auto-off with timer~2h	
<b>Foot pedal</b>	Standard (flame during pressed foot pedal)	
<b>Button</b>	start-stop timer - 60min,	start-stop timer ~2h
<b>Safety control system (SCS) with gas safety cut off</b>	Ignition and flame control, temperature monitor, burner head clogging and assembly monitor (BHC), automatic unit switch off, 4h residual heat display	Ignition and flame control, temperature monitor, burner head clogging and assembly monitor (BHC), automatic unit switch off, 1-2h residual heat display
<b>Gas connection</b>	1/4" left with gas filter	
<b>Gas types</b>	I2ELL3B/P, nature gas E/LL 18-25 mbar, liquid gas, 20-50 mbar	
<b>Connected load</b>	70 g/h liquid gas	
<b>Continuous cartridge operation</b>	CV360 - 40min, Express 444 - 50min, CG1750 - 150min, C206 - 170min, CP250 - 210min, CV470 - 370min	
<b>Flame temperature</b>	1350°C on liquid gas, 1300°C on natural gas (E)	
<b>Temperature threshold level</b>	1kw liquid gas, 1kw natural gas	
<b>IR-Sensor coverage</b>	-	5-50mm, Adjustable
<b>Power consumption</b>	2 VA	
<b>Power connection</b>	100-240V 50/60Hz max. 0.3A 9V DC/1A	
<b>Casing &amp; operating controls</b>	Stainless steel/glass, UV and solvent resistant	
<b>Burner head</b>	removable and decomposable, stainless steel	
<b>Cover of burner shaft</b>	Ø23 mm, with drains	
<b>Measurements (mm)</b>	W103xD49xH130	
<b>Weight</b>	700g	



**Model: AutoLoop, Carousel For Flame Sterilizing Inoculation Loops**

The inoculation loop carousel Autoloop PRO, which is suitable for up to 4 inoculation loops, was developed to comply with current requirements in microbiological, cell biological and bio technological laboratories.

Model	AutoLoop
<b>Technology</b>	Microprocessor
<b>Display</b>	fully graphic dot-matrix
<b>Rotational direction</b>	left / right, depends on removed holder
<b>Inoculation loop holder</b>	1 - 4, with optical holder detection
<b>Time of flame sterilizing</b>	1 - 15 sec
<b>Time for cool-down period</b>	1 - 45 sec
<b>Safety features</b>	temperature control, flame activation warning, indicator of remaining cool-down, tilt sensor, residual heat display
<b>Adjustable sterilization monitor</b>	1 - Off, 2 - low intensity, 3 - middle intensity, 4 - high intensity
<b>Stand by</b>	automatic unit switch off: 1 h (or with stand-by time of the burner)
<b>Operating voltage</b>	via Fuego (foot pedal socket)
<b>Casing</b>	stainless steel & aluminum, UV & solvent resistant
<b>IR-Sensor coverage</b>	5-50mm, Adjustable
<b>Measurements(mm)</b>	W135xD180 Height Autoloop: 305
<b>Weight</b>	1200 g



**CALI-350**

Model	CALI-350
Range	35°C to 300°C
Accuracy	±1°C
Stability	±0.3°C
Heating times	15 Minutes
Well depth	100mm
Power	230V/60Hz
Size (mm)	H57xW125xD150
Weight	3 kg

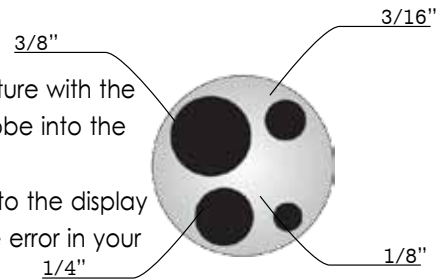
### CALI-350, Portable Dry-Well Calibration, Up To 300°C

They're the smallest, lightest & most portable dry-wells in the world. It's convenient. It has a range to 300°C and is perfect for checking RTDs, thermocouples and bi-metal thermometers in the field.

Plug it in, switch it on, set the temperature with the front panel buttons and insert your probe into the properly sized well.

Compare the reading of your device to the display temperature, and the difference is the error in your device.

The Cali 350 has a display resolution of 0.1 degrees, an accuracy of ±1°C, a stability of ±0.3°C.



**CALI-1200**

### CALI-1200, Thermocouple Calibration Furnace 400 - 1200°C

Model	CALI-1200
Max. temperature (°C)	1200
Continuous temperature (°C)	1150
Temperature range (°C)	400-1200
Stability	Better than +1°C
Overall dimensions (mm)	W310xD225xH399
Heated length (mm)	150
Controller	eurotherm 2132
Indicator	eurotherm 2132
Heating rate	20 mins (to 1150°C)
Cavity diameter (mm)	20
Weight (kg)	8.8
Furnace voltage	120/240 externally selectable
Max. power (W)	1100
Thermocouple type	N

The Portable Thermocouple calibrator is a high stability heat source designed for the calibration of thermocouples up to 7.5mm, with a maximum operating temperature of 1200°C. Thermocouples

are inserted into the work tube through an insulation plug & can be compared with the temperature indicator. It is portable and self contained, with built in PID microprocessor controller & separate digital temperature indicator giving 1°C resolution. The special work tube design results in a much higher temperature uniformity than is normally associated with a furnace of this size. The metallic work tube is earthed for operator safety when used with metal sheathed mineral insulated thermocouples. The CALI-1200 can be used in a laboratory or in site as its rapid heat up and stabilization make it ideal for quick set up. With optional RS-232 communication to control the bath from a PC.



**WBL-102**

### WBL-102, Temperature Calibration Water Bath -30 - 100°C

MRC Temperature Calibration Bench top Bath covers a range from -30°C to 100°C with stability & uniformity of ± 0.1°C. tank volume is nine Liter-large enough to test many sensors at once. Bath opening is 200 x 150 mm, and 150 mm deep.

Using high precision PID microprocessor controller Eurotherm model 3216 with high stability RTD sensor.

With optional RS-232 communication to control the bath from a PC.

### OBH-183, Temp. Calibration Oil Bath Up To 300°C



**OBH-183**

Model	OBH-183
Temp. range	Room temp. +5°C to 300°C
Stability	±0.1°C
Setting/readout	Digital
Heater	1.2KW
Stirring	By built-in circulation pump
Inside DIM.	W30xD30xH20cm
Outside DIM.	W66xD40xH39.5cm
Volume	18L
Power source	110/220V 50/60Hz, 13A/6.5A



CALI-R40

### CALI-R40, Sub-Zero Low Temp. Dry Block Calibrator

Testing and Calibration of Temperature Sensors | Switches, RTD'S, Thermistors (PTC/NTC) | Dial Thermometers | Thermostats.

- Range:  $-35^{\circ}\text{C}$  above ambient to  $123^{\circ}\text{C}$
- Accuracy:  $\pm 0.5^{\circ}\text{C}$ . Resolution:  $0.1^{\circ}\text{C}$ .
- Compact Size: W160xH350xD300mm. Weight: 8kg.
- Stability:  $\pm 0.05^{\circ}\text{C}$ , Well Dia/Depth 19/100mm, Single/Multi-hole Inserts.
- Portable – Field & Lab use.
- Cost Effective.
- Fast Heating & Cooling.
- Switch Test Facility.



CALI-250

### CALI-250, Micro Oil Bath

Portability of Dry Block & Precision of Oil Bath

- Range:  $\text{RT}+20^{\circ}\text{C}$  to  $250^{\circ}\text{C}$ .
- Stability:  $\pm 0.1^{\circ}\text{C}$ .
- Accuracy:  $\pm 0.6^{\circ}\text{C}$ . Resolution:  $0.1^{\circ}\text{C}$ .
- Compact Size: W155xH355xD295mm. Weight: 10kg.
- Working Area: Well Dia 19mm/170mm
- Auto-tune PID Temperature Control.
- Stirrer to ensure Temperature Uniformity.
- (Oil) Spill Proof Transport Lid.
- Optional: RS 232.



CALI-650H1/2

### CALI-650H1/2, Temperature Calibrator

Medium Temperature Dry Block Calibrator.

- Range:  $\text{RT}+20^{\circ}\text{C}$  to  $650^{\circ}\text{C}$ .
- Stability:  $\pm 0.1^{\circ}\text{C}$ .
- Accuracy:  $\pm 1.5^{\circ}\text{C}$ . Resolution:  $0.1^{\circ}\text{C}$ .
- Size for H1: W160xH280xD325mm. for H2: W160xH350xD325mm. Weight: 8.5/11kg.
- Working Area: Depth – 110/190mm
- Heavy Duty Bench Top Model with carrying Handle.
- Auto Tune PID Control action. Switch test Capability.
- Fast and Reliable.
- Interchangeable Thermowell Inserts, Single/Multi-hole.
- Switch Test Capability.



CALI-600

### CALI-600, Temperature Economy Calibrator

Portable | Bench-Top Dry Block. Medium Temperature Calibrators.

- Range:  $\text{RT}+50^{\circ}\text{C}$  to  $600^{\circ}\text{C}$ .
- Stability:  $\pm 0.05^{\circ}\text{C}$ .
- Accuracy:  $\pm 0.1\%$ . Resolution:  $1^{\circ}\text{C}$ .
- Size: W270xL124xH240mm. Weight: 7kg.
- Well – 120mm (200mm optional).
- Analog Output. Provision for Thermostat Switch Testing.
- Interchangeable Thermowell inserts, Single/Multi-hole.



CALI-D350

### CALI-D350, Temperature Calibrator

Dual Dry Block (Hot Cold), Temperature Calibrator

- Truly Portable – for Field & Lab use.
- Most Cost Effective Model in the International Market to Calibrate over a wide range:  $-35^{\circ}\text{C}$  from Ambient to  $350^{\circ}\text{C}$ .
- Stability:  $\pm 0.05^{\circ}\text{C}$ .
- Accuracy:  $\pm 0.5^{\circ}\text{C}$ . Resolution:  $0.1^{\circ}\text{C}$ .
- Size: W244xH430xD341mm. Weight: 8kg.
- Well – Cold 100mm, Hot 120mm.
- Common Display & Dual PO Control Function – for simultaneous Control &
- Calibration time reduced by 50%.
- Housed in elegant sturdy Case.



**CALI-1200HN**

### CALI-1200HN, High Temperature Calibrator

High Temperature Ceramic Dry Block: Calibrator. Stable High (1200°C) Temp. Source for Calibration of Multiple Sensors (up to 6) at High Temperature.

- Range: 300°C above ambient to 1200°C.
- Stability: Better than  $\pm 0.5^\circ\text{C}$  (below 600°C).
- Accuracy: Better than  $\pm 3^\circ\text{C}$ . Resolution:  $1^\circ\text{C}$ .
- Size: W205xD365xH480mm. Weight: 13kg.
- Well Depth - 150mm.
- High Stability.
- RS - 232 Interface.
- Multi-Hole 1 Interchangeable (Thermowell) Inserts - to suit.
- High Accuracy.
- Auto - Tune PID Control. Semi Portable.



**CALI-1500HN**

### CALI-1500HN, Very High Temperature Calibrator

Very High Temperature Ceramic Dry Block: Calibrator

- Temperature Range: 500 to 1500°C.
- Stability:  $\pm 2^\circ\text{C}$ .
- Accuracy:  $\pm 0.5\%$  of Span. Resolution:  $1^\circ\text{C}$ .
- Size: W345xD510xH830mm ( with wheel).
- Fast, Stable & Accurate. Auto-tune PID Controller.
- Heating Element: Silicon Carbide.
- Dry Block: - High Alumina Ceramic
- Single (Interchangeable) & Multi Hole (Fixed).
- Immersion Depth - 250mm.
- Interchangeable Single Hole Thermowells-ID 7/11 & 15 mm\*.
- Semi Portable - Castor Wheels. RS-232 Computer Interface.



**CALI-FB600L**

### CALI-FB600L, Temperature Calibrator

Fluidised bath switch test facility.

- Ideal for calibration of Multi Type odd shaped sensor.
- Temperature Range: RT+20 to 600°C.
- Stability:  $\pm 0.5^\circ\text{C}$ .
- Accuracy:  $\pm 1.5^\circ\text{C}$ . Resolution:  $1^\circ\text{C}$ .
- Size: W730xD470xH780mm.
- Fast, Stable & Accurate.
- Immersion Depth - 250mm/400mm.
- Semi Portable - Castor Wheels optional.
- RS-232 Computer Interface.



**CALI-PP**

### CALI-PP/PPH, Semi-Portable Pressure Calibrators

PP: Ranges: -0.85 to 2/7/10/20 Bar PPH : Ranges: -0 to 200/400 Bar

- Temperature Range: 0 to 50°C (Automatic).
- Accuracy: PP ( $\pm 0.05\%$  F.S. + 1digit). PPH ( $\pm 0.025\%$  F.S. + 1digit)
- Size: L330xB230xH125mm for 2/7/10 bar. L330xB230xH175mm for 20 bar.
- Advanced Microprocessor Based. Light Weight 1 Compact.
- Trendy, Elegant 'Rugged' Case - Truly Portable.
- Resolution: Minimum 5 digits. Large Graphic Display.
- Touch Membrane Keypad with 15 Selectable Pressure Units eg mbar, bar, Kg/cm<sup>2</sup>, Psi, in Hg, mm Hg, mm H<sub>2</sub>O, cm H<sub>2</sub>O, m H<sub>2</sub>O, in H<sub>2</sub>O, ft H<sub>2</sub>O, Pa, MPa, KPa, atm.
- DC Current Measurement: Active Loop: 50 mA, Passive Loop: 25 mA.
- Switch test Capability & Zero Offset facility.
- Audio & Visual Alarms for Over Pressure.
- Ni- MH Rechargeable Batteries with Low Battery Indication.

- Pressure Transducer - All Media Compatible with SS316 .
- Integral 1 In-Built Vacuum & Pressure Hand Pump, Vernier Adjustment & Release Valve .



CALI-PPD

### CALI-PPD, Portable Precision Pressure Calibrator (DUAL) (Pneumatic & Hydraulic)

- Ranges: Pneumatic: -0.85 to 20 Bar, Hydraulic to 400 Bar
- Accuracy:  $\pm 0.05\%$  F.S. + 1 digit.
- Size: L420xW335xH195mm. Weight: 9.5kg.
- Unique Combo 2-in-1 Model.
- Advanced Microprocessor Based. Light Weight / Compact.
- Trendy, Elegant 'Rugged' Case - Truly Portable.
- Resolution: Minimum 5 digits. Large Graphic Display.
- Touch Membrane Keypad with 15 Selectable Pressure Units eg mbar, bar, Kg/cm<sup>2</sup>, Psi, in Hg, mm Hg, mm H<sub>2</sub>O, cm H<sub>2</sub>O, m H<sub>2</sub>O, in H<sub>2</sub>O...
- DC Current Measurement: Active Loop: 50 mA. Passive Loop: 25 mA.
- Switch test Capability & Zero Offset facility.
- Audio & Visual Alarms for Over Pressure.
- NI - MH Rechargeable Batteries with Low Battery Indication.
- Pressure Transducer - All Media Compatible with SS316

- 2 independent integral/ built-in pumps (Pneumatic (Vacuum / Pressure) and Hydraulic) with Verniers.
- Automatic Temperature Compensation (0 to 50°C).



CALI-PPE

### CALI-PPE, Economy Pressure Calibrator (Pneumatic)

- Pneumatic Several - Ranges: -0.85 to 2/10/25/40 bar. Hydraulic 0-700bar.
- Accuracy:  $\pm 0.1\%$  F.S.
- 2 line alpha - numeric display.
- Touch Membrane Keypad with Selectable Pressure Units eg mbar, bar, Kg/cm<sup>2</sup>, Psi, in Hg, mm Hg, mm H<sub>2</sub>O, cm H<sub>2</sub>O, m H<sub>2</sub>O, in H<sub>2</sub>O, ft H<sub>2</sub>O, Pa, MPa, KPa, atm.
- DC Current Measurement: 0 to 50 mA.
- Switch test Capability & Zero Offset facility.
- Audio & Visual Alarms for Over Pressure.
- Pressure Transducer - All Media Compatible with SS316.
- 9V Battery operated with Low Battery indication.
- Digital Pressure Indicator with Matching Pneumatic Hand Pump with vernier.



CALI-PPC

### CALI-PPC, Smart Pressure Calibrator (Pneumatic)

- Advanced Microprocessor based.
- Pneumatic - Several Ranges -0.85 to 2/10/25/40 Bar. Hydraulic 0-700bar.
- Accuracy:  $\pm 0.05\%$  ES.
- Size: 170x100x60mm.
- Automatic Temperature Compensation (0 to 50°C).
- 2 line alpha - numeric display.
- Touch Membrane Keypad with 15 Selectable Pressure Units eg mbar, bar, Kg/cm<sup>2</sup>, Psi, in Hg, mm Hg, mm H<sub>2</sub>O, cm H<sub>2</sub>O, m H<sub>2</sub>O, in H<sub>2</sub>O, ft H<sub>2</sub>O, Pa, MPa, KPa, atm.
- DC Current Measurement: 0 to 50 mA.
- Switch test Capability & Zero Offset facility.
- Audio & Visual Alarms for Over Pressure.
- Pressure Transducer - All Media Compatible with SS316.
- 9V Battery operated with Low Battery indication.
- Digital Pressure Indicator with Matching Pneumatic Hand Pumps with verniers.



CALI-6600/6900

### CALI-6600/6900, High Precision Dead Weight Testers (Hydraulic)

- Ranges: upto 700 bar.
- Standard Accuracies: 0.1% /  $\pm 0.05\%$  /  $\pm 0.025\%$  /  $\pm 0.015\%$  of Rdg.
- Size: L530xW325xD230mm.
- Oil Operated. Single & Dual Piston. Bench/Table Top.
- 4 levels of Accuracy:  $\pm 0.015\%$  of Rdg. (Ultra High),  $\pm 0.025\%$  of Rdg. (Very High),  $\pm 0.05\%$  of Rdg. (High),  $\pm 0.1\%$  of Rdg. (Medium).
- Adjustable feet & Spirit Level.
- Calibrated to Standard Gravity (to user specified Gravity on request).
- Piston Calibrated Thru' "Cross Floating" Techniques.
- Accuracies Traceable to International Standards.

## CALO-11, CALO-11A, CALO-13, CALO-15, Calorimeters



CALO-11A

### Bucket water circulation system



### Applications

The CALO Series calorimeters can be used to determine the calorific value of coal, coke, petroleum, cement black meal, solid biomass fuels and other combustibles. Conformance with Standards: GB/T213-2008 Standard Test Method for Calorific Value of Coal ASTM D5865-2010 Standard Test Method for Gross Calorific Value of Coal and Coke ISO1928 Solid Mineral Fuels – Determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value.

### High Adaptability to Environment

#### Stable internal environment

Jacket and jacket lid equipped with water circulation device and temperature control system, which can make sure the water temperature of each part of the jacket to be consensus and constant, thus the test results will not be affected even if the room temperature fluctuates up to 10°C.



CALO-13

### High Precision and Accuracy of Test Results

#### Independent bucket and jacket water system

Bucket water will be drained to water tank directly after finishing the test, so the inlet and outlet of bucket water will not affect the jacket water.

#### Constant bucket water volume and temperature

Constant volumetric tank with temperature control device makes sure water volume and temperature of each test are exactly the same.

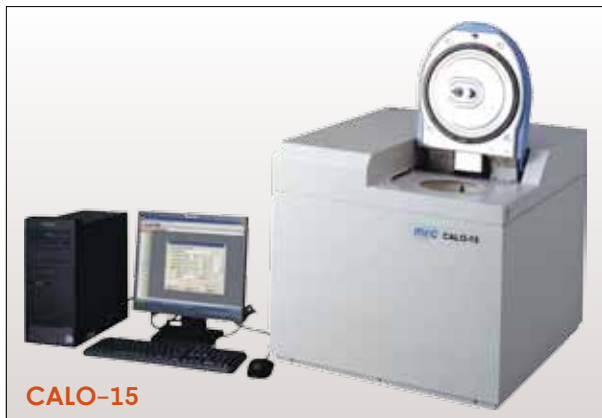
#### High temperature resolution

Temperature measured by PT1000 Platinum resistance to the nearest 0.0001K.

#### Stable and reliable water quality

Equipped with high quality water purification device, the water quality of each test is guaranteed.

Model	CALO-11/11A	CALO-13	CALO-15
Method	Isoperibol		
Analysis Time	< 11min	< 13min	< 15min
Precision	RSD < 0.1%		
Heat Capacity Stability	≤ 0.20% within three months		
Heat Capacity Precision	≤ 0.1%		
Temperature Resolution	0.0001K		
Power Requirement	220V(-15%-10%), 50Hz		
Max Power	1.5kW		
Gas Requirement	99.5% purity of oxygen		
Water Requirement	Distilled water		



**CALO-15**

**Easy to Operate, Handle and Maintain**

- Easy-to-use Windows- based software.
- Easy data handing, real time data can be transmitted through internal network.
- With CAN bus interface, several calorimeters can be controlled by a single PC.
- Connected with balance and network by standard interface RS232.
- Durable bombs need hydrostatic pressure test only once a year.

**High Efficiency and Automation**

**Test in turn without waiting**

With bomb identifier, up to four bombs can be recognized, operators can prepare other bombs while testing thus improvement gained in efficiency & operating time.



**Power Inverter**

**Test finished automatically**

- Automatic oxygen filler equipped, oxygen filling by one press.
- Automatic controlling of water volume, filling, heating, emptying and jacket water circulation.
- Automatic sample ignition.
- Automatic temperature rise measurement and result calculation.

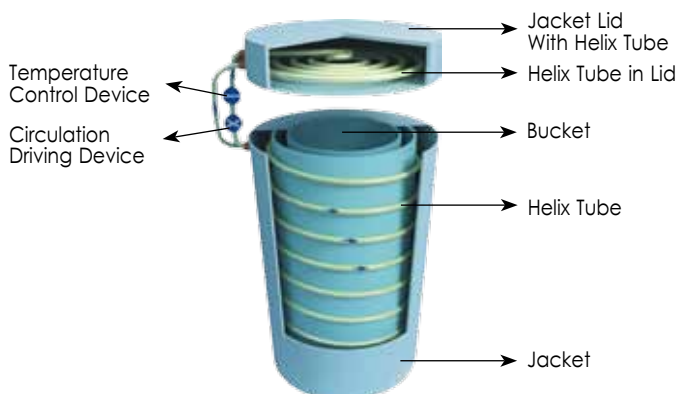


**CALO-15**

**Less sensitive to power supply**

Unique design of inverter which can purify and stabilize the power supply, ensures the calorimeter will not be affected by the fluctuation of power voltage (from 160V to 240V) and frequency.

**Sectional Drawing of Jacket/Lid With Helix Tube Inside**



Model	CALO-11A	CALO-11	CALO-13	CALO-15
<b>Standard Layout</b>	Calorimeter, Lenovo PC (Desktop), Printer	Calorimeter, Water Tank, Lenovo PC (Desktop), Printer		
<b>Type</b>	Vertical type	Benchtop	-	-
<b>Size</b>	437x554x1040mm	432x560x393mm	432x560x393mm	432x560x393mm
<b>Net weight</b>	95kg	60kg	60kg	60kg

**CALO-B, Calorimeter**



**CALO-B**

**Features**

- Weighing the weight and measuring the water temperature of bucket manually, then the calorimeter will finish the whole test automatically.
- Simple structure, easy for maintenance.
- Durable bombs need hydrostatic pressure test only once a year.

- With PCI interface, several calorimeters can be controlled by a single PC.
- Connect with balance and network by standard interface RS232, real time data can be transmitted through internal network.
- Easy-to-use Windows-based software, easy data handling.

Model	CALO-B
<b>Analysis Time</b>	< 25 min
<b>Heat Capacity Stability</b>	≤ 0.20% within three months
<b>Heat Capacity Precision</b>	≤ 0.2%
<b>Temperature Resolution</b>	0.0001K
<b>Power Requirement</b>	220V(-15%~10%), 50Hz
<b>Max Power</b>	0.5kW
<b>Gas Requirement</b>	99.5% purity of oxygen
<b>Water Requirement</b>	Distilled water
<b>Size / Net weight</b>	528x330x380mm / 30Kg

## CALO-40, Calorimeter



### Features

- Vertical type, jacket water  $\geq 40$ kg which can ensure the stability of jacket water temperature.
- Test finished automatically
- Automatic oxygen filler equipped, oxygen filling by one press.
- Automatic sample ignition.
- Automatic temperature rise measurement and result calculation.
- High temperature resolution, temperature measured by PT1000 Platinum resistance to the

nearest 0.0001k to improve the test precision.

- Durable bombs need hydrostatic pressure test only once a year.
- With PCI interface, several calorimeters can be controlled by a single PC.
- Connected with balance and network by standard interface RS232, real time data can be transmitted through internal network.
- Easy-to use Windows-based software, easy data handling.

Model	CALO-40
Analysis Time	15~25 min
Heat Capacity Stability	$\leq 0.20\%$ within three months
Heat Capacity Precision	$\leq 0.15\%$
Temperature Resolution	0.0001K
Power Requirement	220V(-15%~10%), 50Hz
Max Power	0.5kW
Gas Requirement	99.5% purity of oxygen
Water Requirement	Distilled water
Size / Net weight	600x417x908mm / 89Kg

## ELAn-50A, Proximate Analyzer



### High efficiency

During the active analysis, the operator can pre-weigh the next batches of samples.

### Improved accuracy

Sample weighing at room Pow temperature by external and internal balances, effectively reduced the influence caused by balance drift.

### Safe operation

Specially designed volatile matter crucible together with unique auto-sample loading mechanism to avoid the operation of replacement or removal the crucible cover under high temperature thus to avoid the heat emission and hurt to the operator.

### Operation cost saving

Gas supply by compressed air, no oxygen and nitrogen required.

### Easy to operate and handle

- Easy-to-use Windows-based software, after finishing the sample weighing, operator's attendance is not needed.
- Easy data handling, real time data can be transmitted by internal network.
- With CAN bus interface, several proximate analyzers can be controlled by a single PC.
- Connect with balance and network by standard interlace RS232.

Model	ELAn-50A
Sample Weight	0.5~1.1 mg
Furnace Temperature	Room temperature ~ 1000°C
Temp. Control Precision	$\pm 3^\circ\text{C}$ (Moisture) $\pm 5^\circ\text{C}$ (Ash, Volatile matter)
Max Sample	18
Power Requirement	220V(-15%~10%), 50Hz
Gas Requirement	Compressed Air
Max Power	4.5kW
Standard Layout	Proximate Analyzer, Lenovo PC (Desktop), Printer
Size	845x563x596mm
Net weight	146kg



**LCEN-100 Series, Clinical Centrifuges, Eight Places Rotor Of 15ml Tubes, 2500rpm Or 6000rpm**



These centrifuges are widely used in many fields such as biology, medicine, pharmacology, dental, beauty clinics and veterinary laboratory and other regions. They are small, compact, strong and easy and safe for operation. The centrifuge operate smoothly and steadily. The design is up to date, beautiful outlook and durable. ABS outer shell can resist collision. It could accommodate 7ml, 10ml and 15ml centrifuge tubes without changing the rotor. With safety lock, when cover is opened, the motor can be stopped. Precision mechanical timer with bell can be set from 0 to 30 minutes. Speed is linear and stable. Auto balancing system. Vacuum rubber feet provide stable: "not walking" unit.



**Options: Adaptors for tubes**

- (A) Standard 10~15ml tube holder; inner size:Ø17.5mm x L98mm (included).
- (B) Optional 5~7ml tube holder; inner size:Ø13.5mm x L69mm.
- (C) Optional 0.5~2.0ml tube holder; inner size:Ø11.0mm x L42mm.

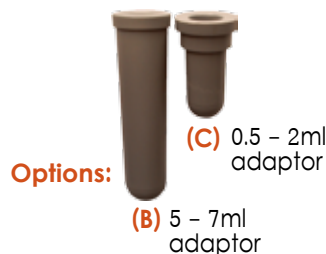
Model	Power Supply	Speed range	Rotor angle	Max. RCF(xG)	Dimensions Weight	Timer	Max. Capacity
LCEN-100	220V/50Hz or 110/60Hz	up to 2500rpm or up to 3200rpm	45°	1210xG	(HxWxDmm) 220x255x255 3kg	0-30min	15ml x 8 Optional adaptors for 7ml and 10ml
LCEN-101	110V/60Hz or 220/60Hz	300-6000rpm	45°	4100xG	(HxWxDmm) 270x255x255 5kg	0-30min	15ml x 8 Optional adaptors for 7ml and 10ml
LCEN-102 with tachometer	110V/60Hz or 220/60Hz	300-6000rpm	45°	4100xG	(HxWxDmm) 270x255x255 5kg	0-30min	15ml x 8 Optional adaptors for 7ml and 10ml



**LCEN-304/312/324, Mini Centrifuges**

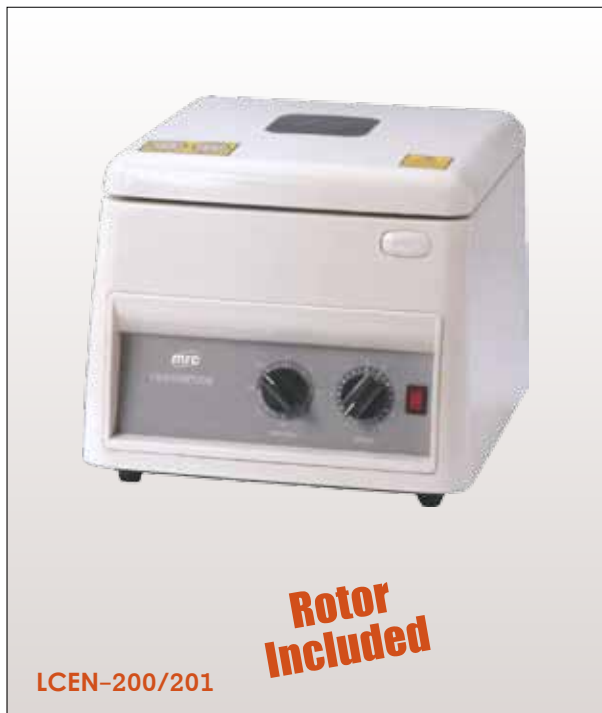
**Features:**

- Table top, attractive, practical, and durable design for your economic choice
- Safety balance
- Speed is linear and stable
- Friendly operate.



**LCEN-304 (Top)**

Model	LCEN-304	LCEN-312	LCEN-324
<b>Rotor</b>	45°C Angle Type Rotor		
<b>Tube Size</b>	50ml	10ml~15ml	
<b>Capacity</b>	4 tubes	12 tubes	24 tubes
<b>Speed</b>	500~3000rpm		
<b>Timer</b>	30 Min. Mechanical Timer With Bell Ring		
<b>Power Supply</b>	110V(220V available)		
<b>Dimension</b>	W300xD300xH315mm		
<b>Net/Gross Weight</b>	8.5/9.0 Kg		



### LCEN-200/201, Compact Clinical-Typed Centrifuges, accept 8 or 12 tubes

#### Features:

- Free change of carbon brush motor, step less speed change.
- Auto power off when open and auto-balance device.
- For angle rotor.
- Power pilot light and fuse safety device.
- ABS hard shell and see-through window.
- Auto-cooling air circulation & manual cover lock.
- **Optional:** 6 ml adapter can be replaced.



Model	LCEN-200	LCEN-201
Max. Speed (rpm)	0~3,000/0~3,500	
Max. RCF (g)	1,360	
Max. Capacity (ml)	10x8	10x12
Timer (min)	0~30 or "ON"	
Weight (kg)	8	
W x D x H Size (cm)	29 x 32 x 25	

#### Rotors for LCEN-200/201 (Included)



R-8  
LCEN-200  
Max. 3,500rpm  
8x15ml



R-12  
LCEN-201  
Max. 3,500rpm  
12x15ml

Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
R-8	3,500	1,360	15 x 8	12~16.5x70~117
R-12	3,500	1,360	15 x 12	12~16.5x70~100

**LCEN-401, Digital Clinical Centrifuge, 8 tubes 15ml**



**LCEN-401**

**Features:**

- Speed range of 300-4500rpm
- Max rotor capability 15ml x 8
- Precise control speed & time with efficient separation
- For 15ml cell culture tubes & full line of collection tubes, ideal for a clinical lab
- Quiet and stable operation with noise level ≤56db
- Include adapters for 1.5-10ml.

Clinical centrifuge is ideal for separation of serum, plasma, urea, blood samples and other routine applications in hospital and research laboratories.

**Advantages:**

- High strength plastic rotor and excellent balance technology to guarantee a quiet and stable operation
- Dual protection casing provides reliable running
- Brushless motor drive quickly and effortlessly accelerates the rotor to set speed.





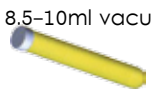




**Precise control**

- CPU controls all operating parameters including speed and time
- High accuracy of speed, excellent performance
- Operation can be timed from 30 seconds to 99 minutes or continuous running
- Timer commences once the set speed is reached, so the separation time is more accurate
- Gentle braking at low speeds with efficient separation.

**Ergonomic design**

- User-friendly large LCD display show all information
- RPM or G-force can be set and displayed
- Parameters can be modified after the set speed is reached
- Quick spins are possible by pressing and holding PULSE key. The centrifuge speed can be accelerated & held at the target speed.
- Automatic release the lid when operation has stopped to save processing time
- Easy-to-read processing display and sound alert.



Rotor Type	Tubes	Available Tubes	Dimensions (Ø x L mm)	Adapters (included)	Maximum Speed (rpm)	Radius (cm)	Maximum RCF (x g)
<b>A12-10P</b> 	15ml con 	8	17 x 120		4500	11	2490
	1.5-5ml vacu 	12	13 x 82	A10P15 & Mat 	4500	9.8	2218
	4-7ml vacu 	12	13 x 106 16 x 75	A10P15 A10P15 & Mat 	4500	11 9.8	2490 2218
	8.5-10ml vacu 	12	16 x 107	A10P15 	4500	11	2490
	2.7-3ml(EU) collection tube 	12	11 x 66	A10P15 & Mat 	4500	9.8	2218
	7.5-8.2ml(EU) collection tube 	12	15 x 92	A10P15 	4500	11	2490

REMARK: A12-10P rotor is made of plastic & cannot be autoclaved or UV irradiation, only ordinary sterilization can be used.

# CENTRIFUGES 300ml Capacity



**SCEN-207 (Rotor not included)**

Model	SCEN-207
Max. Speed (rpm)	5,500
Max. RCF (g)	3,280
Max. Capacity (ml)	300
Timer (min)	0~30 or "ON"
Weight (kg)	9
W x D x H Size (cm)	29 x 32 x 25

## SCEN-207, Beginner's Small Universal Centrifuge

### Features:

- Analog speed tachometer.
- Optional rotor selections for various tube sizes.
- Regressive timer: 30min, or continuous operation.
- Angle rotor, stepless speed setting.
- Auto accelerating and decelerating functions.
- Auto-current restraining function.
- Power pilot light and fuse safety device.
- Manual cover lock.
- Speed: 5,500rpm; Timer: 0~30 or "ON".
- Max. capacity: 300 ml.
- Weight: 9kg.
- Size: W29xD32xH25cm.
- Auto power off when open and auto-balance device.
- ABS hard shell and see-through window.
- Auto-cooling air circulation.



### Rotors for SCEN-207



**RA-5004** 50ml x 4pcs  
Max. 5,500rpm



**RA-5006** 50ml x 6pcs  
Max. 5,500rpm



**RA-1508** 15ml x 8pcs  
Max. 5,500rpm



**RA-1512S** 15ml x 12pcs  
Max. 5,500rpm



**REA-1520** 1.5ml x 20pcs  
Max. 4,000/5,500rpm

	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
<b>RA-1508</b>	0~5,500	3,140	15 x 8	15~16.7x90~122
<b>RA-1512S</b>		3,280	15 x 12	15~16.7x90~122
<b>RA-5004</b>		3,240	50 x 4	27.5~29.5x90~117
<b>RA-5006</b>		3,240	50 x 6	27.5~29.5x90~117
<b>REA-1520</b>		2,600	1.5 x 20	10~11x36~56



**MDCEN-301SD**

**(Rotor SB-071550 included)**

## MDCEN-301SD, Digital Centrifuge, Angle Swing Rotors

Digital Centrifuge is equipped with digital speed display, so users can set required speed accurately with no overshoot. Metal housing is sturdy & durable.

### Features:

- Digital Centrifuge is a table top centrifuge, with attractive, practical and durable design for your economic choice.
- Auto-balancing system can extend the motor life and reduce the noise.
- With safety switch, it can prevent the lid from being opening during operation.
- Digital Centrifuge features a see-through window.
- Digital Centrifuge with good ventilation system can prevent the motor from overheating.
- A quick button offering short runs.
- Automatic braking system.
- LED dig. display for the remaining time & the present speed.
- Digital Centrifuge is easy to operate.

### Specifications of rotors:

Model	Max. Speed	Rotor type	Capacity
<b>AR-1512</b>	4,000rpm	45° angle	12 tubes x(10~15)ml
<b>AR-1524</b>	4,000rpm	45° angle	24 tubes x(10~15)ml
<b>AR-5004</b>	4,000rpm	45° angle	4 tubes x 50ml
<b>UAR-1512</b>	6,000rpm	45° angle	12 tubes x(10~15)ml
<b>SB-071550 (Included)</b>	4,000rpm	Swing-out	16 tubes x(5~7)ml 12 tubes x(10~15)ml 4 tubes x 50ml

ECEN-6/7/10, Mini Centrifuges, 6 Places



Model	ECEN-6	ECEN-7	ECEN-10
Power requirement	30W	30W	40W
Max. rotational speed	6,000rpm	7,000rpm	10,000rpm
Relative centrifugal force(RCF)	2,000×g	2,300×g	5,000×g
Rotor	6×1.5/2.0ml angle rotor		
	2×8×0.2ml strip rotor		-
	Rotor for slide	-	-
Dimensions(W×D×H)	175×148×118mm		

ECEN-14, High Speed Centrifuge, 12 Places



Features:

- Extremely quiet operation.
- Easy-to-follow LCD display.
- Capacity: 12×1.5/2.0ml tubes.
- Include adapters for 0.5ml & 0.2ml.
- Separate short-spin key.
- Low sample heating (only 12°C after 30min, at max. speed).
- Autoclavable rotor (121°C, 20min).
- RPM/RCF setting as required.
- Includes standard rotor made of anodized aluminum.
- Timer can be set up to 99min.
- The small size of the unit makes it convenient for bench top use or in a hood or in refrigerated environments.



Model	ECEN-14
Power requirement	105W
Max. rotational speed	14,500rpm
Relative centrifugal force (RCF)	14,000×g
Timer	20sec—99min
Acceleration time to max. speed	42s
Braking time from max. speed	55s
Dimensions (W×D×H)	240×212×138mm

# CENTRIFUGES Microcentrifuge 12, 18 Places

## ECEN-12, High Speed Mini Centrifuge, 12 Places



### Powerful personal centrifuge

- Powerful centrifugal force 15100xg and Max speed 15000rpm, serves many applications
- Brushless motor drives quickly and effortlessly accelerates the rotor to the set speed
- The rotor is designed for 1.5/2.0ml tubes and smaller 0.2ml and 0.5ml tubes through use of adaptors. PCR strips are optional.

### Conform to international safety standards & regulations

- ECEN-12 Plus has passed explosion-proof test and marked with CE, cTUVus and FCC. MCA test according to IEC/EN 61010-2-20
- Cast iron chassis with low gravity, provides stable and reliable running at maximum speed
- Multi voltage design with high speed accuracy and reliable running.

Model	ECEN-12
Max. Speed (rpm)	15000rpm (500-15000rpm), increment: 100rpm
Max. RCF (x g)	15100 x g, increment: 100 x g
Speed Accuracy (rpm)	±20 rpm
Temperature Range	N/A
Rotor Capacity	0.2ml/0.5ml/1.5ml/2ml x 12
Run Time	30sec-99min-HOLD (Continuous operation)
Driving Motor	Brushless DC motor
Safety Devices	Door interlock, Over-speed detection; Over-temperature detection; Automatic internal diagnosis
Power	Single-phase, ACII OV-220V, 50Hz/60Hz, 3A
Noise level (dB)	≤54
Acceleration/Braking time (See)	11s ↑ 9s ↓
Dimensions (mm)	(L)255 x (D)245 x (H)140
Weight	6kg
Additional Features	Speed/Acceleration switch; Short-time run function; sound-alert function

## ECEN-205, High Speed Centrifuge, 18 Places



### Features:

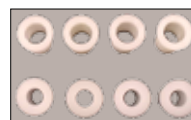
- LED speed & time display.
- Microprocessor control.
- 10 memory programs for preset parameters.
- Auto accelerating and decelerating functions.
- The transient centrifugal functions.
- Auto cover lock with motor running.
- Auto power off for rotor imbalance.
- Auto buzzer when finish.
- ABS hard shell and see-through window.
- Auto-cooling air circulation.
- Low noise.



**REA-1518**  
(Included)  
1.5/2.0ml x 18 places



Optional adaptors 0.5ml and 0.2ml



**Rotor Included**

Model	Speed(rpm)	Rotor	Max. RCF (g)	Max. capacity (ml x pcs)	Timer (min:sec)	Weight (kg)	WxDxH Size (cm)
ECEN-205	1000~14,000	REA-1518	16,000	1.5/2.0 x 18	99:59	8	29x32x24.5

AC110/220V, 50/60Hz, Tubes not included.

**ECEN-15, Micro Centrifuge**



ECEN-15

Brushless

**Features:**

- Co-using Angle Rotors (A 1.5/2.0mlx24) & PCR Strip rotor (0.2mlx32)
- Ergonomically arranged and designed
- Memory for saving experiment condition [10 memories]
- Speedy acceleration and deceleration (accel 15 sec, decel 15sec / Max. 15,000 rpm)
- Efficient BLOC Motor(400W) – Brushless motor provides maintenance free operation
- Fast Cooling
- Detecting imbalance
- Applied stainless steel chamber to reduce rotational friction heat

**ECEN-17R, Refrigerated Micro Centrifuge**



ECEN-17R

Brushless

**Features:**

- Co-using Angle Rotors (A 1.5/2.0mlx24) & PCR Strip rotor (0.2mlx32)
- Ergonomically arranged and designed
- Memory function
- Speedy acceleration 15secs & deceleration 15secs (15,000 rpm)
- 5 steps for acceleration and deceleration can be selected for delicate liquid experiment
- 2 way-types of freezing radiator
- Efficient BLDC Motor(400W) – Brushless motor provides maintenance free operation
- Fast Cooling
- Detecting over speed, over heat, system error and door opening
- Patented compressor technology reduces vibrations and protects your sample
- Exceptionally quiet operation, with or without rotor lid
- Easy-to-read interface displays both speed (rpm) and force (ref)
- Easy-to-use knobs

Model	ECEN-15	
RPM / RCF	15,00 / 21,055xg	A1.5/2.0ml x 24
Max. capacity	1.5/2.0ml x 24	
Time	99min 59sec	Pulse cycle mode Continuous run,
Display	Rpm, Rcf, Time, Prog.	
Motor	BLDC/400W	
Accel/Decel	Accel:15 sec. Decel: 15 sec.	in 15,000rpm
Rotor	Fixed Angle 1.5/2.0ml x 18 Fixed Angle 1.5/2.0ml x 24 PSR Rotor 0.2ml x 32	
Dimension	293W x 380D x 242H/mm	
Weight	15Kg	

\* Please note that technical specifications are subject to change.



A1.5/2.0M-24



A1.5/2.0M-18



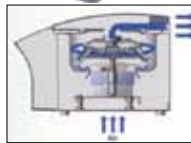
A1.5MP-24



Quick acceleration and deceleration helps speedy test process and special rubber hub attached rotor absorbs vibration to keep perfect repeatability.



Simple and elegant display panel



Effective emitting heat caused by rotor rotation and motor case through the air flow from under the main frame.

Model	ECEN-17R	
RPM / RCF	17,00 / 23,005xg 15,00 / 21,055xg	1.5/2.0ml x 18 1.5/2.0ml x 24
Max. capacity	1.5/2.0ml x 24	
Time	99min 59sec	Pulse cycle mode Continuous run,
Temp	-10°C~+40°C	
Display	Rpm, Rcf, Time, Temperature, Acc/dec, Rotor number, Prog	
Motor	BLDC/400W	
Accel/Decel	5 Step (accel:15 sec. decel: 15 sec.)	in 15,000rpm
Rotor	Fixed Angle 1.5/2.0mlx18 Fixed Angle 1.5/2.0mlx24 PSR Rotor 0.2ml	
Dimension	295Wx553Dx282H/mm	
Weight	30Kg	

\* Please note that technical specifications subject to change.



A1.5/2.0M-24



A1.5/2.0M-18



A1.5MP-24



Quick acceleration and deceleration helps speedy test process and special rubber hub attached rotor absorbs vibration to keep perfect repeatability.



Optimized inside chamber for effective cool-down



Fast temperature correction Inventive 2way radiator for maintaining refrigeration temperature for long term and fast correction.

# CENTRIFUGES Brushless, Microcentrifuge, 18/24 Places



Model	ECEN-209-18	ECEN-209-24
Max. Speed (rpm)	1,000~14,000	
Rotor (ml)	18 x 1.5/2.0ml	24 x 1.5/2.0ml
Max. RCF (g)	17,740	
Capacity (ml x pcs)	1.5/2.0x24	
Temp. Range	0°C~40°C	
Timer (min:sec)	99:59	
Weight (kg)	15	
W x D x H size (cm)	29 x 42 x 28	

Tubes not included AC110/220V, 50/60Hz

## ECEN-209, Micro-Size High-Speed Centrifuge 18, 24 Places

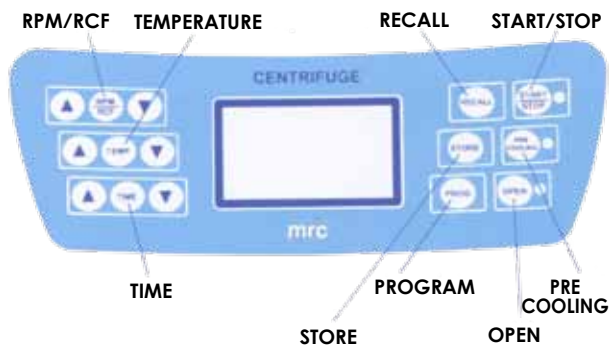
### Features:

- LCD, speed and RCF setting, and display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.
- Auto power off for rotor imbalance, overload, breakdown indication & safety protection device.

**Rotor Included**







**ECENR-210/211/212, Micro-Size High-Speed Refrigerated Centrifuge**

**Features:**

- LCD, temperature, speed and RCF setting, and display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.
- Auto power off for rotor imbalance, overload, breakdown indication and safety protection device.



Model	ECENR-212	ECENR-210	ECENR-211
Max. Speed (rpm)	1,000~14,000		
Max. RCF (g)	17,740		
Capacity (ml x pcs)	1.5/2.0x24		
Temp. Range	0°C~40°C		
Timer (min:sec)	99:59		
Weight (kg)	60	40	45
WxDxH size (cm)	32 x 50 x 80	55 x 42 x 28	34 x 70 x 28

AC110/220V, 50/60Hz

**Rotor for ECEN-209-18**



**REA-1518**  
1.5/2.0ml x 18pcs  
Max.14,000rpm

**Rotor for ECENR-210/211/212**



**REAC-1518**  
1.5/2.0ml x 18pcs  
Max.14,000rpm

**Rotor for ECEN-209-24, ECENR-210/211/212**



**REAC-1524**  
1.5/2.0ml x 24pcs  
Max.14,000rpm

**Rotor for ECEN-209-18/24, ECENR-210/211/212**



**REAC-0232**  
0.2ml x 32pcs  
(8 Tube PCR strip x 4)  
Max.14,000rpm

Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
<b>REA-1518</b>	14,000	15,770	1.5/2.0x18	9.5~11x36~42
			0.5x18	7~7.9x25~34
			0.4x18	5.4~6.1x26~48
			0.2 PCRx18	5.9~6.3x20~24
<b>REAC-1518</b>	14,000	15,550	1.5/2.0x18	9.5~11x36~42
			0.5x18	7~7.9x25~34
			0.4x18	5.4~6.1x26~48
			0.2 PCRx18	5.9~6.3x20~24
<b>REAC-1524</b>	14,000	17,740	1.5/2.0x24	9.5~11x36~42
			0.5x24	7~7.9x25~34
			0.4x24	5.4~6.1x26~48
			0.2 PCRx24	5.9~6.3x20~24
<b>REAC-0232</b>	15,110	14,000	0.2 PCRx32	9.5~11x36~42

# CENTRIFUGES Medium 400ml



## MDCEN-302/ MDCEN-321/MDCENR-311/MDCENR-301, 400ml Memory Program Centrifuges

### Features:

- LCD, speed and RCF setting, and display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.
- Auto power off for rotor imbalance, overload, breakdown indication and safety protection device.













Model	MDCEN-302	MDCENR-321	MDCENR-301	MDCENR-311
Max. Speed (rpm)	500~6,000			
Max. RCF (g)	4,260			
Capacity(ml x pcs)	400			
Temp. Range	0°C~40°C			
Timer (min:sec)	99:59			
Weight (kg)	18	85	55	60
WxDxH size (cm)	36 x 48 x 34	43 x 58 x 85	65 x 55 x 35	44 x 72 x 35

Tubes not included

AC110/220V, 50/60Hz

**Rotors for MDCEN/R-301/302/311/321**

									
2-3400-27	2-3400-28	2-3400-23	2-3400-24	2-3400-21	2-3400-22	2-3400-32	2-3400-25	2-3400-26	2-3400-33
6ml x36pcs	1.5ml x48pcs	50ml x4pcsTC	15ml x12pcsTC	100ml x4pcs	50ml x4pcs	15ml x16pcs	10ml x24pcs	6ml x40pcs	15ml x8pcs

Rotor	Capacity (ml x pcs)	Tube size (Ø x L) mm	Max. Speed (rpm)	Max. RCF (g)	Cat. No.
 <b>RS-50</b>	100x4	42~45x95~112	3,500	1,970	2-3400-21
	50x4	32~35x90~117	4,000	2,480	2-3400-22
	15x16	13.5~16.7x86~115	3,500	1,970	2-3400-32
	10x24	14~15.5x85~113	3,500	1,970	2-3400-25
	6x40	11~12.7x63~88	3,500	1,620	2-3400-26
	6x36	11~12x85~106	3,500	1,930	2-3400-27
	1.5x48	10~11x36~56	3,500	1,310	2-3400-28
	50x4TC	26.5~29.5x90~120	4,000	2,550	2-3400-23
	15x12TC	15~17x85~120	3,500	1,990	2-3400-24
	15x8	15~17x90~122	3,500	1,910	2-3400-33



**RA-1508**  
15ml x 8pcs  
Max. 6,000rpm



**RA-1512H**  
15ml x 12pcs  
Max. 6,000rpm



**REA-1520**  
1.5ml x 20pcs  
Max. 6,000rpm

Rotor	Capacity (ml x pcs)	Tube size (Ø x L) mm	Max. Speed (rpm)	Max. RCF (g)
<b>RA-1508</b>	15x8	15~16.7x90~122	6,000	3,740
<b>RA-1512H</b>	15x12	15~16.7x90~122	6,000	4,260
<b>REA-1520</b>	1.5x20	10~11x36~56	6,000	3,090



**RA-1516**  
15ml x 16pcs  
Max. 4,000rpm



**RA-1024**  
10ml x 24pcs  
Max. 3,500rpm

Rotor	Capacity (ml x pcs)	Tube size (Ø x L) mm	Max. Speed (rpm)	Max. RCF (g)
<b>RA-1516</b>	15x16	15~16.7x90~115	4,000	2,210
<b>RA-1024</b>	10x24	15~16.7x90~107	3,500	1,750



**RA-5004**  
50ml x 4pcs  
Max. 6,000rpm



**RA-5006**  
50ml x 6pcs  
Max. 6,000rpm



**RA-5008**  
50ml x 8pcs  
Max. 6,000rpm

Rotor	Capacity (ml x pcs)	Tube size (Ø x L) mm	Max. Speed (rpm)	Max. RCF (g)
<b>RA-5004</b>	50x4	27.5~29.5x94~130	6,000	3,860
<b>RA-5006</b>	50x6	27.5~29.5x90~130	6,000	3,860
<b>RA-5008</b>	50x8	27.5~29.5x90~117	6,000	4,260



**LGCEN-5**



**HBTM-5 (HSR-4S)**



**HM-2**



**HBT15-8 (HSR-4S)**

### Minimized noise

Air from the upper side of chamber makes air flow optimized. BLDC Motor (Brushless motor) minimizes noise and vibration (under 60dB)

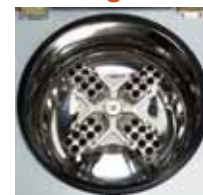
### Still waiting the result?

Motor driving system optimizing: Speedy and smooth acceleration and deceleration makes stable separation.

### LGCEN-5, Multipurpose bench top centrifuge for labs in hospitals and universities

#### Features:

- Easy and speedy operation and correction by volume knob
- Graphic LCD display
- Various tube adapters
- Design saving working space
- Highly efficient BLDC motor
- 10 levels of Accel./Decel. is suitable for separation of sensitive layers
- Automatic RPM/RCF calculating system
- Memory function setting the condition of test.



**Optimized chamber for effective air circulation.**



**Simple and elegant display channel**

Model	LGCEN-5
<b>RPM</b>	5,500rpm
<b>RCF</b>	5,411 xg
<b>Max. capacity</b>	15ml x 32
<b>Time</b>	99hrs 59min 59sec
<b>Display</b>	RPM, RCF, Time, Program, Accel/Decel Time, Rotor Number, Rotor Radius
<b>Accel/Decel</b>	10 step
<b>Motor</b>	BLDC Motor 700w
<b>Power supply</b>	110V/220V, 60Hz, single phase
<b>Dimension</b>	570W x 475D x 325H/mm
<b>Weight</b>	40Kg

\* Please note that technical specifications subject to change.



**LGCEN-55R**



**HBTM-5 (HSR-4S)**



**HM-2**



**HBT15-8 (HSR-4S)**

### Powerful AC Motors & Cooling System

Environmentally refrigerating system of CFC-free and efficient cooling

### Easily moveable type of floor standing

### Tubes of various volumes

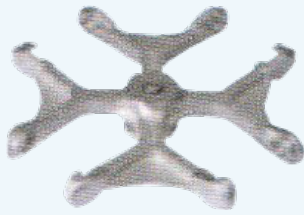
### LGCEN-55R, Multipurpose refrigerated centrifuge

#### Features:

- One chip Microprocessor control
- Easy-to-use control
- Environmentally refrigerating system of cfc-free and efficient cooling
- RPM/RCF auto calculating
- Feedback control system
- Brushless AC Induction motor
- Memory for saving experiment condition
- Temperature control system for delicate experiment.

Model	LGCEN-55R
<b>RPM</b>	5,500rpm
<b>RCF</b>	5,411 xg
<b>Max. capacity</b>	15ml x 32
<b>Time</b>	9hrs 59min 59sec
<b>Display</b>	RPM, RCF, Time, Temp, Program, Accel/Decel Rotor Number, Rotor Radius
<b>Warning Display</b>	Imbalance, Door open, Over speed, Over temp
<b>Temp</b>	-10°C ~ 40°C
<b>Accel/Decel</b>	3 step
<b>Motor</b>	AC Induction Motor
<b>Power supply</b>	110V/220V, 60Hz, single phase
<b>Dimension</b>	570W x 475D x 325H/mm
<b>Weight</b>	122 Kg

\* Please note that technical specifications subject to change.



**HSR-4S**

**Type** Swing Rotor  $\pm 90^\circ$   
**Max. RPM** 5,500 rpm  
**Max. RCF** 6,131 xg  
**Radius** 181.3 mm  
**Dim. for** LGCEN-5 / LGCEN-55R



**HBTM-5**

**Type** Rack Holder  
**Max. RPM** 3,000 rpm  
**Max. RCF** 1,681 xg  
**Radius** 167.1 mm

Tube Capacity (ml)	15	15(16)	50	50	50	3	5	10	15(16)
<b>Dimensions <math>\varnothing</math> x L mm</b>	17x120	18x99.3	30x115	29x104	29x104	10x60	11x75	13x100	18x99.3
<b>Tube Type</b>									
<b>Adapter</b>									
<b>Tube per Adapter</b>	4	8	1	1	2	20	14	12	8
<b>Tube per Rotor</b>	16	32	4	4	8	80	56	48	32
<b>Max. RCF</b>	3,089	2,910	5,148	6,131	5,067	1,651	1,651	1,651	1,651
<b>radius (mm)</b>	172.7	162.7	184.2	181.3	181.3	164.1	164.1	164.1	164.1
<b>RPM</b>	4,000	4,000	5,000	5,500	5,000	3,000	3,000	3,000	3,000
<b>boring <math>\varnothing</math> x Lmm</b>	18x99.5	18x89.5	315x115.9	30x99	30x99	10x55	11x55	13x55	18x55
<b>Color / Material</b>	STS	STS	AL	STS	STS	White	Green	Red	Blue
<b>Cat.NO.</b>	HBT15-4C	HBT15-8	HBT50-1C	HBT50-1	HBT50-2	HTR-1	HTR-2	HTR-3	HTR-4
<b>Max. length <math>\varnothing</math> x L mm</b>	18x149	18x139	31.5x161	30x158	30x158	10x140	11x140	13x140	18x140

LGCEN-5 (Dim. 222.5x222.5x42mm), Max. RPM: 5,500 Max. RCF: 6,131 xg  
 LGCEN-55R (Dim. 222.5x222.5x48mm), Max. RPM: 4,000 Max. RCF: 3,470 xg

**Multipurpose Centrifuge Accessories**



# CENTRIFUGES Large 1000ml



## LGCEN-404, Memory Program Centrifuge

### Features:

- LCD speed and time display with RCF setting.
- Quiet brushless motor.
- Microprocessor control.
- 10 memory programs for preset parameters.
- Overheat and overload safety protection.
- Auto power off for rotor imbalance.
- Auto buzzer when finish.
- hidden auto-balance device.
- Auto power off when open.
- Auto cover lock with motor running.
- Power pilot light and fuse safety device.
- Auto accelerating and decelerating functions.
- See-through window.
- Optional rotor selections for various tube size.
- Low noise.








Model	LGCEN-404	LGCENR-400	LGCENR-401
Max. Speed(rpm)	500~6,000		
Max. RCF (g)	4,830		
Capacity(ml x pcs)	1,000		
Temp. Range	0°C~40°C		
Timer (min:sec)	99:59		
Weight (kg)	40	112	75
WxDxH size(cm)	45 x 56 x 38	52 x 65 x 90	80 x 60 x 38

### Rotors for LGCEN-404/400/401












Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm	Cat. No.
<p>RS-50</p>	4,500	3,260	15x16	14~17.5x85~112	2-3400-32
	4,000	2,480	50x4	32~35x90~117	2-3400-22
	5,000	4,020	100x4	42~45x95~112	2-3400-21
	5,500	4,830	50x4TC	26.5~29.5x90~120	2-3400-23

Rotors for LGCEN-404, LGCENR-400/401

				
<b>RS-9602</b> 96 micro x 4 Max. 2,500rpm	<b>RS-2504</b> 250ml x 4pcs Max. 3,500rpm	<b>RA-5008B</b> 50ml x 8pcs Max. 6,000rpm	<b>RA-1512H</b> 15ml x 12pcs Max. 6,000rpm	<b>RS-1548</b> 15ml x 48pcs Max. 3,500rpm
Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
<b>RS-9602</b>	2,500	1,170	96micro x4	126~129x83~86
<b>RS-2504</b>	3,500	2,310	250x4	61~65.5x90~130
<b>RA-5008B</b>	6,000	4,260	50x8	27.5~29.5x90~118
<b>RA-1512H</b>	6,000	4,260	15x12	13.5~16.7x86~130
<b>RS-1548</b>	3,500	4,270	15x48	14~17.5x85~112

								
<b>2-5400-21</b> 6ml x56pcs	<b>2-5400-22</b> 10ml x48pcs	<b>2-5400-23</b> 10ml x48pcs	<b>2-3400-22</b> 50ml x4pcs	<b>2-5400-24</b> 50ml x8pcs	<b>2-3400-21</b> 100ml x4pcs	<b>2-3400-32</b> 15ml x16pcsTC	<b>2-3400-32</b> 15ml x16pcsTC	<b>2-5400-25</b> 50ml x8pcsTC
Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm	Cat. No.			
 <b>RS-100</b>	3,500	2,150	6x56	10~13x50~105	2-5400-21			
	3,500	2,150	10x48	13~16x50~107	2-5400-22			
	3,500	2,100	15x32	14~17.5x85~112	2-5400-23			
	4,000	2,870	50x4	32~35x90~135	2-3400-22			
	3,500	2,200	50x8	32~35x90~120	2-5400-24			
	4,000	2,960	100x4	42~45.5x95~130	2-3400-21			
	3,500	2,280	15x16TC	13.5~16.7x86~135	2-3400-32			
	5,000	4,630	50x4TC	26.5~29.5x90~137	2-3400-23			
3,500	2,270	50x8TC	26.5~29.5x90~127	2-5400-25				

							
<b>Carrier</b>	<b>2-6000-21</b> 1.5ml x96pcs	<b>2-6000-22</b> 6ml x112pcs	<b>2-6000-23</b> 10ml x80pcs	<b>2-6000-24</b> 15ml x48pcs	<b>2-6000-25</b> 15ml x40pcsTC	<b>2-6000-26</b> 50ml x16pcsTC	<b>2-6000-27</b> 250ml x4pcs
Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm	Cat. No.		
 <b>RS-250</b>	3,500	2,350	1.5x96	8~10.7x41~100	2-6000-21		
			6x112	8.5~12x60~110	2-6000-22		
			10x80	12~15.8x60~100	2-6000-23		
			15x48	14.5~17.2x60~122	2-6000-24		
			250x4	58~62x70~130	2-6000-27		
			15x40TC	14~16.5x60~122	2-6000-25		
			50x16TC	27.5~29.5x50~125	2-6000-26		



**S750T-6B**



**TM96-6S**



**A1000S-6**

### Mini Plant in Lab

Capacity up to 6L at once Maximize your output

### Rotor Switching System

Both using Angle & Swing rotor for various sampling

### Worried about heavy rotor mounting?

Ergonomically arranged and designed machine to maximize user's convenience with easy mounting.

### Optimized chamber for various rotors

Optimized chamber and special rubber hub attached rotor absorbs vibration to keep perfect repeatability.

### LGCEN-512R Plus, Super Size Multipurpose Centrifuge



Sampling capacity maximum at 6L Pilot / Swing out rotor.



#### Features:



- Co-using Angle & Swing rotor
- Using bucket style 750ml high-capacity swing rotor
- Large capacity: 6 x 1,000ml rotor
- Ergonomically designed control display
- Hi-efficient AC Induction Motor 1.7kw
- Spin down (Pulse) function
- User password for preventing access from random people
- 10 steps for speedy and gradual acceleration and deceleration
- A special suspension system enables the stable centrifugation.
- The centrifuge stands on movable castors and adjustable feet to even out the floor.



Model	LGCEN-512R Plus	
<b>RPM / RCF (Swing rotor)</b>	4,000rpm / 5,096xg	S750T-6B
<b>RPM / RCF (Angle rotor)</b>	12,000rpm / 22,265xg	A250ml x 6
<b>Max. capacity</b>	1,000ml x 6 (Fixed angle rotor) 750ml x 6 (Swing rotor)	
<b>Time</b>	99hrs 59min 59sec	
<b>Display</b>	RPM, RCF, Time, Acc, Dec, Temp Limits, Temp., Rotor NO., Program, Rotor Radius	
<b>Temperature</b>	-10°C~+40°C	
<b>Motor</b>	AC Induction Motor	
<b>Accel/Decel</b>	0~9 (10 step)	
<b>Rotor</b>	Swing rotor 750ml x 6 Fixed Angle 1000ml x 6 1000ml x 4, 500ml x 6, 250ml x 6	
<b>Power supply</b>	AC220V, SO/60Hz	
<b>Dimension</b>	668W x 801 D x 891 H/mm	
<b>Weight</b>	250Kg	

\* Please note that technical specifications subject to change.

A250S-6 	Tube Capacity	250ml	250ml
	Dimensions Ø x L mm	61.8x127.7	61.8x134
Tube Type			
Type: Angle Rotor <25°C Max. RPM: 14,000rpm Max. RC: 30,305xg Radius: 138.3mm for LGCEN-512R Plus	Tube per Rotor	6	
	Max. RCF	30,305	
	radius (mm)	138.3	
	boring Ø x Lmm	62x103	

A1000S-4 	Tube Capacity	1000ml	
	Dimensions Ø x L mm	96x176	
Tube Type			
Type: Angle Rotor <25°C Max. RPM: 8,000rpm Max. RC: 12,157xg Radius: 169.9mmfor LGCEN-512R Plus	Tube per Rotor	4	
	Max. RCF	12,157	
	radius (mm)	169.9	
	boring Ø x Lmm	97x144	

A500S-6 	Tube Capacity	500ml	
	Dimensions Ø x L mm	69.5x170	
Tube Type			
Type: Angle Rotor <25°C Max. RPM: 10,000rpm Max. RC: 17,743xg Radius: 158.7mm for LGCEN-512R Plus	Tube per Rotor	6	
	Max. RCF	17,743	
	radius (mm)	158.7	
	boring Ø x Lmm	70x141	

A1000S-6 	Tube Capacity	1000ml	
	Dimensions Ø x L mm	96x176	
Tube Type			
Type: Angle Rotor <25°C Max. RPM: 7,000rpm Max. RC: 10,962xg Radius: 200.1mm for LGCEN-512R Plus	Tube per Rotor	6	
	Max. RCF	10,962	
	radius (mm)	200.1	
	boring Ø x Lmm	97.5x144	





**S750T-6B**  
**Type** Swing Rotor  $\angle 90^\circ$   
**Max. RPM** 4,500 rpm  
**Max. RCF** 5,096 xg  
**Radius** 225.1 mm  
**Dim.** 333.7x362x55mm

**B750**



**Round Bucket**  
750ml capacity

**B750 Lid**



**Sealing Cap**

**TM96-4S**



**MicroTiter Plate rack**

Model	T5-26	T10-26	T15-19	T50-7	T250-1	T500-1		T50-5C	T15-14C	TS50-5	
<b>Tube Capacity (ml)</b>	5	10	15	50	250	500	750	50	15	50	MTP
<b>DIM. Ø x L mm</b>	12x75	13x100	16x114	29x104	61.8x123	69.5x170.2	97x152	30x115	17x120		
<b>Tube Type</b>											
<b>Adapter</b>											-
<b>Tube per Adapter</b>	26	26	19	7	1	1	-	5	14	5	-
<b>Tube per Rotor</b>	156	156	114	42	6	6	6	30	84	30	6
<b>Max. RCF</b>	4,992	4,972	4,997	4,809	5,030	5,024	5,094	5,071	4,967	4,870	3,433
<b>radius (mm)</b>	220.5	219.6	220.7	212.4	222.2	221.9	225.0	221.6	219.4	215.1	191.9
<b>RPM</b>	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
<b>boring Ø x Lmm</b>	13x0	14x89.5	17x99.5	29.2x81	62.2x99	75.5x99	99x105	29.5x99.5	17x89	27x65	-
<b>Color / Material</b>	Magenta	Yellow	Green	White	Cyan	Violet	-	Blue	Sky Blue	Black	-
<b>Max. length ØxLmm</b>	13x157	14x156.5	17x157.5	29.2x149	62.2x159	75.5x158.5	99x162	29.5x158.5	17x156	27x90	-

Model	T5-30	T10-24	T15-17	T50-4	T250-1	T500-1
<b>Tube Capacity (ml)</b>	5	10	15	50	250	500
<b>Adapter</b>						
<b>Tube per Adapter</b>	30	24	17	4	1	1
<b>Tube per Rotor</b>	180	144	102	24	6	6
<b>Max. RCF</b>	4,870	4,870	4,870	4,870	4,870	4,870
<b>radius (mm)</b>	215.1	215.1	215.1	215.1	215.1	215.1
<b>RPM</b>	4,500	4,500	4,500	4,500	4,500	4,500
<b>boring Ø x Lmm</b>	13x55	13.5x80	17.3x80	29x80	62x80	74x80
<b>Color / Material</b>	Crimson	Yellow	Green	White	Red	Blue
<b>Max. length ØxLmm</b>	17x152	13.5x152	17.3x152	29x152	62x152	74x152



### Large Capacity

Using various tubes from 5ml to 750ml, you are able to get large sampling. (6pcs bucket)

- Vacuumtainer Tube: 144ea
- 15ml Conical Tube: 84ea
- 50ml Conical Tube: 30ea



Tube rack for various sizes of tube  
Two-staged adjustable tube rack for diverse tube lengths

### LGCEN-512R, Large Capacity Refrigerated Centrifuge

Large capacity refrigerated centrifuge capable of handling 180 sample units at once.

#### Features:

- Using bucket style, 750ml high capacity swing rotor
- Ergonomically arranged control and display
- Hi-efficient AC Induction Motor 1.7kw
- Spin down (Pulse) function
- User password for preventing access from random people
- 10 steps for speedy and gradual acceleration and deceleration



**WS750-6B**  
6x750ml 5,096xg  
4,500rpm 22cm  
**Wind Shield Swing Bucket Rotor**

Model	LGCEN-512R	
<b>RPM / RCF</b>	4,500rpm / 5,096xg	WS750-6B
<b>Max. capacity</b>	750ml x6	
<b>Time</b>	99hrs 59min 59sec	
<b>Display</b>	RPM, RCF, Time, Acc, Dec, Temp Limits, Temp., Rotor NO., Program, Rotor Radius	
<b>Temperature</b>	-10°C~+40°C	
<b>Motor</b>	AC Induction Motor	
<b>Accel/Decel</b>	0-9 (10 step)	
<b>Rotor</b>	Swing rotor 750mlx6	WS750-6B
<b>Power supply</b>	AC220V, 50/60Hz	
<b>Dimension</b>	668W x 801D x 891 H/mm	
<b>Weight</b>	250Kg	

\* Please note that technical specifications subject to change.

	<b>WS750-6B</b> Wind Shield				<b>B750</b>		<b>B750 Lid</b>		<b>TM96-4S</b>		
	<b>Type</b> Swing Rotor ∠90° <b>Max. RPM</b> 4,500 rpm <b>Max. RCF</b> 5,096 xg <b>Radius</b> 225.1 mm <b>Dim.</b> 333.7x362x55mm				 <b>Round Bucket</b> 750ml capacity		 <b>Sealing Cap</b>		 <b>MicroTiter Plate rack</b>		
Model	T5-26	T10-26	T15-19	T50-7	T250-1	T500-1	T50-5C	T15-14C	TS50-5		
<b>Tube Capacity (ml)</b>	5	10	15	50	250	500	750	50	15	50	MTP
<b>DIM. Ø x L mm</b>	12x75	13x100	16x114	29x104	61.8x123	69.5x170.2	97x152	30x115	17x120		
<b>Tube Type</b>											
<b>Adapter</b>											-
<b>Tube per Adapter</b>	26	26	19	7	1	1	-	5	14	5	-
<b>Tube per Rotor</b>	156	156	114	42	6	6	6	30	84	30	6
<b>Max. RCF</b>	4,992	4,972	4,997	4,809	5,030	5,024	5,094	5,071	4,967	4,870	3,433
<b>radius (mm)</b>	220.5	219.6	220.7	212.4	222.2	221.9	225.0	221.6	219.4	215.1	191.9
<b>RPM</b>	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
<b>boring Ø x Lmm</b>	13x0	14x89.5	17x99.5	29.2x81	62.2x99	75.5x99	99x105	29.5x99.5	17x89	27x65	-
<b>Color / Material</b>	Magenta	Yellow	Green	White	Cyan	Violet	-	Blue	Sky Blue	Black	-
<b>Max. length ØxLmm</b>	13x157	14x156.5	17x157.5	29.2x149	62.2x159	75.5x158.5	99x162	29.5x158.5	17x156	27x90	-



**LGCEN-408**

**LGCEN-408, Air cooling Large Centrifuge**

Multipurpose Large Centrifuge used in hospitals, universities and laboratories.

**Features:**

- Co-using Angle & PCR rotor
- Using bucket style 750ml high-capacity swing rotor (page 127)
- Ergonomically arranged and designed
- Spin down (Pulse) function
- Customized key pad (Easy operation and correction)
- 10 steps for acceleration and deceleration can be selected for delicate liquid experiment
- RPM/RCF auto calculating
- Changing term of timer during operation
- Radius of rotor set up by unit of 0.1 mm
- Memory for saving experiment condition.

Model	LGCEN-408	
<b>RPM</b>	8,000 rpm (Fixed angle rotor) 4,000 rpm (Swing rotor)	S750T-4B
<b>RCF</b>	8,279rpm (Fixed angle rotor) 3,515xg (Swing rotor)	A85S-6
<b>Max. capacity</b>	85ml x 6 (Fixed angle rotor) 750ml x 4 (Swing rotor)	
<b>Time</b>	1 hrs 59min 59sec	
<b>Display</b>	RPM, RCF, Time, Program, Accel/Decel Time, Rotor Number, Rotor Radius	
<b>Accel/Decel</b>	10 step	
<b>Motor</b>	BLDC Motor 1.5Kw	
<b>Power supply</b>	220V, 60Hz, single phase	
<b>Dimension</b>	530W x 676D x 400H/mm	
<b>Weight</b>	70Kg	

**Swing Rotors (more details page 127)**



**S750T-4B**

**TM96-4S**

**A85S-6**

**BLDC Motor**

Speedy acceleration/deceleration, noiseless and motionless, large sampling (15ml-750ml)

**Easy Keypad**

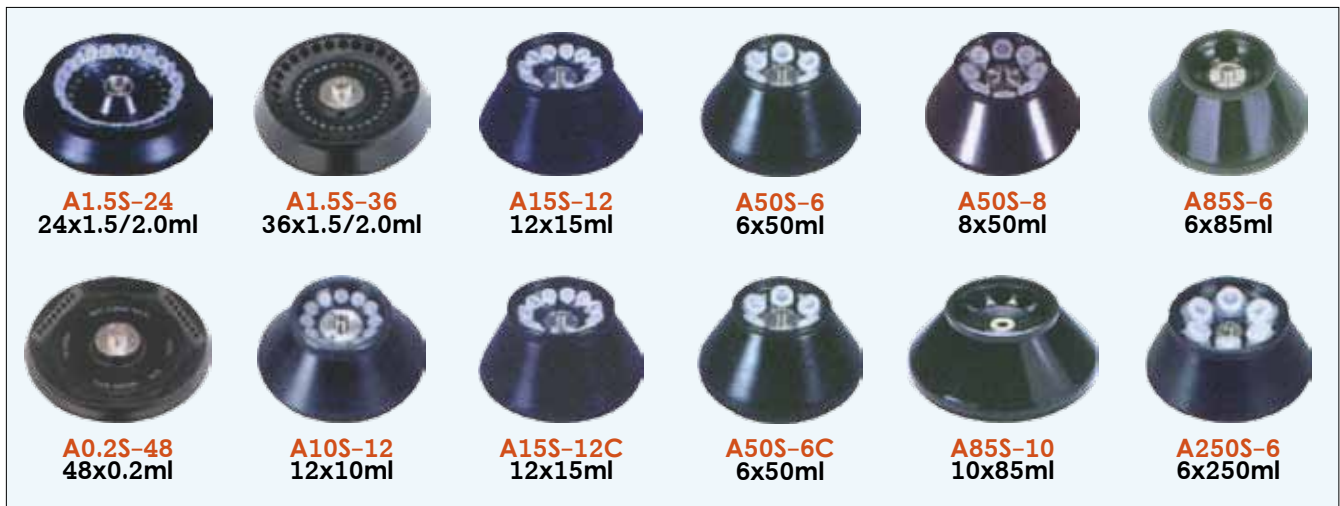
Easy to use control panel for everyone.

**Compact design**

Space-saving design for interior.

\* Please note that technical specifications subject to change.

**Angle Rotors for LGCEN-408 (more details page 125-127)**





### LGCEN-514R, Table-top Refrigerated Centrifuge

Large sample handling/high-speed Bench Top refrigerated centrifuge.

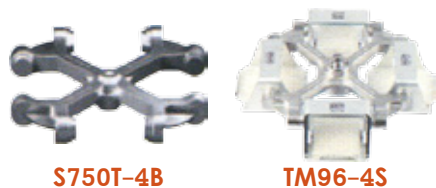
#### Features:

- Co-using Angle & Swing rotor
- Using bucket style 750ml high-capacity swing rotor
- Ergonomically arranged and designed
- Spin down (Pulse function)
- Customized key pad (Easy operation and correction)
- 10 steps for acceleration and deceleration can be selected for delicate liquid experiment
- Eco-friendly CFC Free freezing system
- RPM/RCF auto calculating
- Changing term of timer during operation
- Radius of rotor set up by unit of 0.1 mm
- Memory for saving experiment condition
- Fast Cooling (down to 4°C in 15 min)
- Short spin key: Spin down in 1 min
- Lid Latch by motor: preventing imbalance of sample.

Model	LGCEN-514R	
<b>RPM</b>	15,000 rpm (Fixed angle rotor) 4,500 rpm (Swing rotor)	A50S-8
<b>RCF</b>	24,878 xg (Fixed angle rotor) 4,392 xg (Swing rotor)	S750T-4B
<b>Max. capacity</b>	250ml x 6 (Fixed angle rotor) 750ml x 4 (Swing rotor)	A50S-8
<b>Time</b>	99hrs 59min 59sec	S750T-4B
<b>Display</b>	RPM, RCF, Time, Temperature, Program, Temp. Limit, Accel/Decel Time, Rotor Number, Rotor Radius	
<b>Accel/Decel</b>	10 step	
<b>Temperature</b>	-10°C~+40°C	
<b>Motor</b>	AC Induction Motor	WS750-6B
<b>Power supply</b>	220V, SO/60Hz, single phase	
<b>Dimension</b>	723W x 665D x 387H/mm	
<b>Weight</b>	112Kg	

\* Please note that technical specifications subject to change.

#### Swing Rotors (more details page 127)



#### AC Induction Motor Cooling System

Speedy acceleration and deceleration, little noise and vibration. Capability for large Sample (0.2ml-750ml).

Efficient Cooling by CFC Free Freezing system.

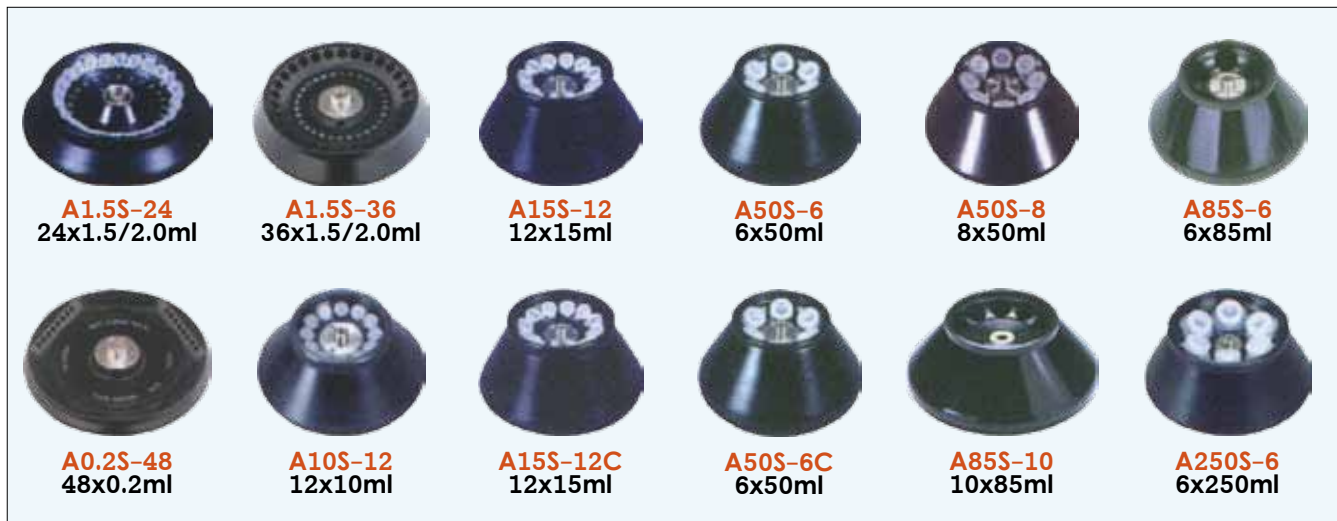
#### Easy to Keypad

Applied easy to use control pad for anybody.




#### Rotor Switching System




Easy to exchange angle or Switching Rotor for handling various samples.


#### Angle Rotors for LGCEN-514R (more details page 125-127)











<p><b>A0.2S-48</b></p>  <p>Type: Angle Rotor &lt;45°C Max. RPM: 12,500rpm Max. RCF: 15,530 xg Radius: 88.9mm</p>	<b>Tube Capacity (ml)</b>	0.2ml	0.2ml			<p>LGCEN-408 Max. RPM: 8,000 Max. RCF: 6,361 xg</p> <p>LGCEN-514R Max. RPM: 12,500 Max. RCF: 15,530 xg</p>
	<b>Dimensions Ø x L mm</b>	6x18				
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	48	6 Strips			
	<b>Max. RCF</b>	15,530				
	<b>radius (mm)</b>	88.9				
<b>boring Ø x L mm</b>	6.5x15					



<p><b>A1.5S-24</b></p>  <p>Type: Angle Rotor &lt;40°C Max. RPM: 30,000rpm Max. RCF: 81,301 xg Radius: 80.8mm</p>	<b>Tube Capacity (ml)</b>	0.2ml	0.5ml	1.5ml	2.0ml	<p>LGCEN-408 Max. RPM: 8,000 Max. RCF: 5,781 xg</p> <p>LGCEN-514R Max. RPM: 15,000 Max. RCF: 20,325 xg</p>
	<b>Dimensions Ø x L mm</b>	6x18	8x30	11x38	11x38	
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	24				
	<b>Max. RCF</b>	61,982	70,434	81,301		
	<b>radius (mm)</b>	61.6	70	80.8		
	<b>boring Ø x Lmm</b>	6x21	8x37	11x37.5		

<p><b>A1.5S-36</b></p>  <p>Type: Angle Rotor &lt;45°C Max. RPM: 20,000rpm Max. RCF: 52,546 xg Radius: 115.7mm</p>	<b>Tube Capacity (ml)</b>	0.2ml	0.5ml	1.5ml	2.0ml	<p>LGCEN-408 Max. RPM: 8,000 Max. RCF: 8,279 xg</p> <p>LGCEN-514R Max. RPM: 14,000 Max. RCF: 25,353 xg</p>
	<b>Dimensions Ø x L mm</b>	6x18	8x30	11x38	11x38	
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	36				
	<b>Max. RCF</b>	42,573	46,643	52,546		
	<b>radius (mm)</b>	95.2	104.3	115.7		
<b>boring Ø x Lmm</b>	6x21	8x37	11x37.5			






<p><b>A10S-12</b></p>  <p>Type: Angle Rotor &lt;36°C Max. RPM: 30,000rpm Max. RCF: 85,628 xg Radius: 85.1mm</p>	<b>Tube Capacity (ml)</b>	10ml				<p>LGCEN-408 Max. RPM: 8,000 Max. RCF: 6,361 xg</p> <p>LGCEN-514R Max. RPM: 12,500 Max. RCF: 15,530 xg</p>
	<b>Dimensions Ø x L mm</b>	16x82				
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	12				
	<b>Max. RCF</b>	85,628				
	<b>radius (mm)</b>	85.1				
<b>boring Ø x L mm</b>	16.3x74.5					



<p><b>A15S-12C</b></p>  <p>Type: Angle Rotor &lt;25°C Max. RPM: 17,000rpm Max. RCF: 32,084 xg Radius: 99.3mm</p>	<b>Tube Capacity (ml)</b>	15ml				<p>LGCEN-408 Max. RPM: 8,000 Max. RCF: 7,112 xg</p> <p>LGCEN-514R Max. RPM: 15,000 Max. RCF: 25,004 xg</p>
	<b>Dimensions Ø x L mm</b>	17x120				
	<b>Tube Type</b>					
	<b>Tube per Rotor</b>	12				
	<b>Max. RCF</b>	32,116				
	<b>radius (mm)</b>	99.4				
	<b>boring Ø x Lmm</b>	17x115				

<p><b>A15S-12</b></p>  <p>Type: Angle Rotor &lt;25°C Max. RPM: 30,000rpm Max. RCF: 96,696 xg Radius: 96.1mm</p>	Tube Capacity (ml)	15(16)ml				<p><b>LGCEN-408</b> Max. RPM: 8,000 Max. RCF: 6,876 xg</p> <p><b>LGCEN-514R</b> Max. RPM: 15,000 Max. RCF: 24,174 xg</p>
	Dimensions Ø x L mm	18x100				
	Tube Type					
	Adapter					
	Tube per Rotor	12				
	Max. RCF	96,696				
	radius (mm)	96.1				
boring Ø x L mm	19x96					
























<p><b>A50S-6C</b></p>  <p>Type: Angle Rotor &lt;40°C Max. RPM: 17,000rpm Max. RCF: 29,402 xg Radius: 91mm</p>	Tube Capacity (ml)	50ml				<p><b>LGCEN-408</b> Max. RPM: 8,000 Max. RCF: 6,511 xg</p> <p><b>LGCEN-514R</b> Max. RPM: 15,000 Max. RCF: 22,891 xg</p>
	Dimensions Ø x L mm	29x115				
	Tube Type					
	Adapter					
	Tube per Rotor	6				
	Max. RCF	29,693				
	radius (mm)	91.9				
boring Ø x Lmm	29.5x108.6					

<p><b>A50S-6</b></p>  <p>Type: Angle Rotor &lt;30°C Max. RPM: 30,000rpm Max. RCF: 96,696 xg Radius: 96.1mm</p>	Tube Capacity (ml)	15(16)ml	50ml	50ml		<p><b>LGCEN-408</b> Max. RPM: 8,000 Max. RCF: 6,876 xg</p> <p><b>LGCEN-514R</b> Max. RPM: 15,000 Max. RCF: 24,174 xg</p>
	Dimensions Ø x L mm	18x100	28.7x104	28.8x107		
	Tube Type					
	Adapter					
	Tube per Rotor	6				
	Max. RCF	90,558	96,696			
	radius (mm)	90.0	96.1			
boring Ø x Lmm	18.5 x 92	29 x 100				

<p><b>A50S-8</b></p>  <p>Type: Angle Rotor &lt;30°C Max. RPM: 30,000rpm Max. RCF: 99,513 xg Radius: 98.9mm</p>	Tube Capacity (ml)	15(16)ml	50ml	50ml		<p><b>LGCEN-408</b> Max. RPM: 8,000 Max. RCF: 7,076 xg</p> <p><b>LGCEN-514R</b> Max. RPM: 15,000 Max. RCF: 24,878 xg</p>
	Dimensions Ø x L mm	18x100	28.7x104	28.8x107		
	Tube Type					
	Adapter					
	Tube per Rotor	8				
	Max. RCF	93,375	99,513			
	radius (mm)	92.8	98.9			
boring Ø x Lmm	18.5 x 92	29 x 100				























<p><b>A85S-6</b></p>  <p>Type: Angle Rotor &lt;25°C Max. RPM: 25,000rpm Max. RCF: 64,425 xg Radius: 92.2mm</p>	Tube Capacity (ml)	85ml				<p><b>LGCEN-408</b> Max. RPM: 8,000 Max. RCF: 6,597 xg</p> <p><b>LGCEN-514R</b> Max. RPM: 15,000 Max. RCF: 23,193 xg</p>
	Dimensions Ø x L mm	38.2 x 105.7				
	Tube Type					
	Tube per Rotor	6				
	Max. RCF	64,425				
	radius (mm)	92.2				
boring Ø x Lmm	38.5 x 90					









 <p><b>S500T-4B (for LGCEN-514R &amp; LGCEN-408)</b>                  Type Swing Rotor <math>\angle 90^\circ</math>                  Max. RPM 4,500 rpm                  Max. RCF 4,392 xg                  Radius 194 mm                  Dlm. 262x262x62 mm</p>	 <p><b>B500</b> Round Bucket 500ml capacity</p>		 <p><b>B500 Lid</b> Sealing Cap</p>		 <p><b>TM96-4S</b> MicroTiter Plate rack</p>						
	<b>Model</b>	T5-26	TR10-9	TR15-9	TR50-4	TR100-1	TR250-1	TR500-1	TR50-3C	TR15-7C	
	<b>Tube Capacity (ml)</b>	5	10	15	50	100(85ml)	250	500	50	15	MTP
	<b>Dimensions <math>\varnothing</math> x L mm</b>	12x75	16x100	16x114	29x104	38x105.7	61.8x123	69.5x170.2	30x115	17x120	
<b>Tube Type</b>											
<b>Adapter</b>										-	
<b>Tube per Adapter</b>	26	9	9	4	1	1	1	3	7	-	
<b>Tube per Rotor</b>	104	36	36	16	4	4	4	12	28	4	
<b>Max. RCF radius (mm)</b>	3,433	4,279	4,290	4,290	4,290	4,290	4,347	4,302	4,313	3,486	
<b>radius (mm)</b>	191.9	189.0	189.5	189.5	189.5	189.5	192.0	190.0	190.5	154.0	
<b>RPM</b>	4,000	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,000	
<b>boring <math>\varnothing</math> x Lmm</b>	13x70	17x64	16.5x85	30x85.5	38.5x84.5	62x100	73x101	30x90	17x95.5	-	
<b>Color / Material</b>	Magenta	Cyan	Khaki	Sky Blue	Brown	Violet	Chartreuse	Blue	Pink	-	
<b>Max. length <math>\varnothing</math> x L mm</b>	13x153.5	17x151	16.5x151.5	30x151.5	38.5x151.5	62x151.5	73x154	30x152	17x152.5	-	

LGCEN-514R Max. RPM: 4,500 Max. RCF: 4,392 xg

LGCEN-408 Max. RPM: 4,000 Max. RCF: 3,470 xg

 <p><b>S750T-4B</b>                  Type Swing Rotor <math>\angle 90^\circ</math>                  Max. RPM 4,000 rpm                  Max. RCF 3,515 xg                  Radius 196.5 mm                  Dlm. 277X277X55 mm</p>	 <p><b>B750</b> Round Bucket 750ml capacity</p>		 <p><b>B750 Lid</b> Sealing Cap</p>		 <p><b>TM96-4S</b> MicroTiter Plate rack</p>							
	<b>Model</b>	T5-26	T10-26	T15-19	T50-7	T250-1	T500-1		T50-5C	T15-14C	T50-5	
	<b>Tube Capacity (ml)</b>	5	10	15	50	250	500	750	50	15	50	MTP
	<b>Dimensions <math>\varnothing</math> x L mm</b>	12x75	13x100	16x114	29x104	61.8x123	69.5x170.2	97x152	30x115	17x120	-	-
<b>Tube Type</b>										-		
<b>Adapter</b>							-			-	-	
<b>Tube per Adapter</b>	26	26	19	7	1	1	-	5	14	5	-	
<b>Tube per Rotor</b>	104	104	76	28	4	4	4	20	56	20	4	
<b>Max. RCF radius (mm)</b>	3,433	3,417	3,438	3,288	3,463	3,458	3,515	3,452	3,413	3,336	2,925	
<b>radius (mm)</b>	191.9	191.0	192.2	183.8	193.6	193.3	196.5	193.0	190.8	186.5	163.5	
<b>RPM</b>	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
<b>boring <math>\varnothing</math> x Lmm</b>	13x70	14x89.5	17x99.5	29.2x81	62.2x99	75.5x99	99x105	29.5x99.5	17x89	27x65	-	
<b>Color / Material</b>	Magenta	Yellow	Green	White	Cyan	Violet	-	Blue	Sky Blue	Black	-	
<b>Max. length <math>\varnothing</math> x L mm</b>	13x153.5	14.1x52.5	17x151	29.2x145	62.2x155	75.5x55	99x158	29.5x146.5	17x152	27x90	-	

<b>Model</b>	T5-30	T10-24	T15-17	T50-4	T250-1	T500-1
<b>Adapter</b>						
<b>Tube per Adapter</b>	30	24	17	4	1	1
<b>Tube per Rotor</b>	120	29	68	16	4	4
<b>Max. RCF radius (mm)</b>	3,336	3,336	3,336	3,336	3,336	3,336
<b>radius (mm)</b>	186.5	186.5	186.5	186.5	186.5	186.5
<b>RPM</b>	4,000	4,000	4,000	4,000	4,000	4,000
<b>boring <math>\varnothing</math> x Lmm</b>	13x55	13.5x80	17.3x80	29x80	62x80	74x80
<b>Color / Material</b>	Crimson	Yellow	Green	White	Red	Blue
<b>Max. length <math>\varnothing</math> x L mm</b>	13x148	13.5x148	17.3x148	29x148	62x148	74x148

LGCEN-408  
Max. RPM: 4,000 Max. RCF: 3,515 xg

LGCEN-514R  
Max. RPM: 4,000 Max. RCF: 3,515 xg

# CENTRIFUGES High-Speed 300ml



SCEN-206/HSCEN-204

## SCEN-206/HSCEN-204, Digital Universal Centrifuges

### Features:

- LED speed and time display.
- Microprocessor control.
- 10 memory programs for preset parameters.
- Auto accelerating and decelerating functions.
- Auto cover lock with motor running.
- Auto power off for rotor imbalance.
- Auto buzzer when finish.
- Speed: 500~6000rpm/1,000~10,000rpm  
Timer: 99min 59 sec.
- Max. Capacity: 300ml.
- Weight: 10kg.
- Size: W29xD32xH25cm.
- ABS hard shell and see-through window.
- Auto-cooling air circulation.
- Optional rotor selections for various tube size.



Model	SCEN-206	HSCEN-204
Max. Speed (rpm)	500~6,000	1,000~10,000
Max. RCF (g)	3,860	10,390
Max. Capacity (ml)	300	
Timer (min:sec)	99:59	
Weight (kg)	10	
W x D x H Size (cm)	29 x 32 x 25	

### Rotors for SCEN-206

(Rotor not included)



**RA-1508**  
15ml x8pcs  
Max. 6,000rpm



**RA-1512S**  
15ml x12pcs  
Max. 6,000rpm



**RA-5004**  
50ml x4pcs  
Max. 6,000rpm



**RA-5006**  
50ml x6pcs  
Max. 6,000rpm



**REA-1520**  
1.5ml x20pcs  
Max. 6,000rpm

### Rotors for HSCEN-204 (High-Speed)



**RA-1508**  
15ml x8pcs  
Max. 10,000rpm



**RA-1512S**  
15ml x12pcs  
Max. 9,000rpm



**RA-5004**  
50ml x 4pcs  
Max. 8,000rpm



**RA-5006**  
50ml x 6pcs  
Max. 7,000rpm

Rotor	HSCEN-204		SCEN-206		Capacity (ml x pcs)	Tube size (Ø x L) mm
	Max. Speed (rpm)	Max. RCF (g)	Max. Speed (rpm)	Max. RCF (g)		
RA-1508	10,000	10,390	6,000	3,740	15 x 8	15~16.7x90~122
RA-1512S	9,000	8,780	6,000	3,900	15 x 12	15~16.7x90~122
RA-5004	8,000	6,860	6,000	3,860	50 x 4	27.5~29.5x90~117
RA-5006	7,000	5,250	6,000	3,860	50 x 6	27.5~29.5x90~117
REA-1520	-	-	6,000	3,090	1.5 x 20	10~11x36~56





**HSCEN-10001**

**HSCEN-10001, High Speed Centrifuge**



**Features:**

- LCD, speed and RCF setting and display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.
- Auto power off for rotor imbalance, overload, breakdown indication and safety protection device.

Model	HSCEN-10001
Max. Speed (rpm)	1,000~10,000
Max. RCF (g)	10,950
Capacity (ml x pcs)	400
Timer (min:sec)	99:59
Weight (kg)	35
W x D x H size (cm)	36 x 48 x 34

Rotor & Tubes not included

AC110/220V, 50/60Hz

**Rotors for HSCEN-1001**



**RA-1508**  
15ml x 8pcs  
Max. 10,000rpm



**RA-1512HS**  
15ml x 12pcs  
Max. 9,000rpm



**RA-5004**  
50ml x 4pcs  
Max. 8,000rpm



**RA-5006**  
50ml x 6pcs  
Max. 7,000rpm



**RA-5008**  
50ml x 8pcs  
Max. 6,500rpm

Rotor	Capacity (ml x pcs)	Tube size (Ø x L) mm	Max. Speed (rpm)	Max. RCF (g)
<b>RA-1508</b>	15x8	15~16.7x90~122	10,000	10,950
<b>RA-1512HS</b>	15x12	15~16.7x90~122	9,000	10,130
<b>RA-5004</b>	50x4	27.5~29.5x94~130	8,000	7,080
<b>RA-5006</b>	50x6	27.5~29.5x90~130	7,000	5,400
<b>RA-5008</b>	50x8	27.5~29.5x90~117	6,500	5,280



## HSCEN-17R, Economic Model of High Speed Refrigerated Centrifuge

### Features:

- Microprocessor control
- Simple way to operate
- CFC Free freezing system
- RPM/RCF auto calculating
- Feed back control system
- AC induction motor with no brush
- Memory for saving experiment condition
- Various angle fixed rotor

Model	HSCEN-17R
RPM	17,000 rpm
RCF	31,341 xg
Max. capacity	85ml x 6
Time	9hrs 59min 59sec
Display	RPM, RCF, Time, Temperature, Program, Temp.Limit, Brake Time, Rotor Number
Accel/Decel	3 step
Temperature	-10°C ~ 40°C
Motor	AC Induction Motor
Power supply	220V, 60Hz, single phase
Dimension	550W x 600D x 865H/mm
Weight	140Kg

\* Please note that technical specifications subject to change.

### Easy Keypad

Easy to use control panel for everyone.

### Compact Design

Ergonomically arranged and designed for user's interface.

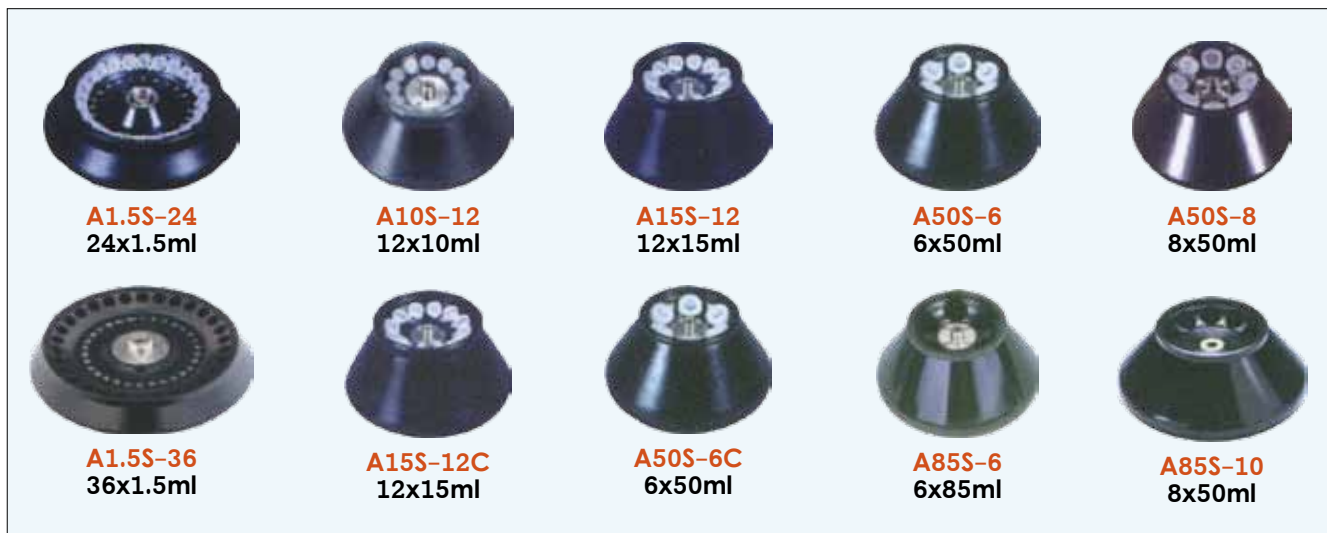
### High Torque Drive System

Great presenting by powerful AC Induction motor.

### Emergency System

Switching door open system preventing damage of sample when power off.

### Angle Rotors (more details page 134-136)





HSCEN-22K

**Easy rotor connecting**

Ergonomically arranged and designed machine, HSCEN-22K maximizes user's convenience with easy connecting.

**Easy Keypad**

Easy to use control panel for everyone.

**Emergency System**

Switching door open system preventing damage of sample when power off.

**Rotor Identification System**

Automatically identifying rotor for user's convenience.

**Adaptors**



**HSCEN-22K, Ergonomically designed model of High Speed Centrifuge**

**Features:**

- One chip microprocessor control
- Customized key pad (Easy operation and correction)
- Memory for saving experiment condition
- RPM/RCF auto calculating
- Changing term of timer during operation
- 10 steps for acceleration and deceleration for delicate liquid experiment
- Spin-down
- Maximum Fixed Angle Rotor 1,000 ml x 4
- Patented compressor technology reduces vibrations and protects your sample
- PWM (pulse width modulation) motor control has realized
- AC Induction drive technology provides you with fast separations Shorter run times mean more discovery for you. HSCEN-22K high torque switched reluctance drive gives you more time at speed and less time getting there.

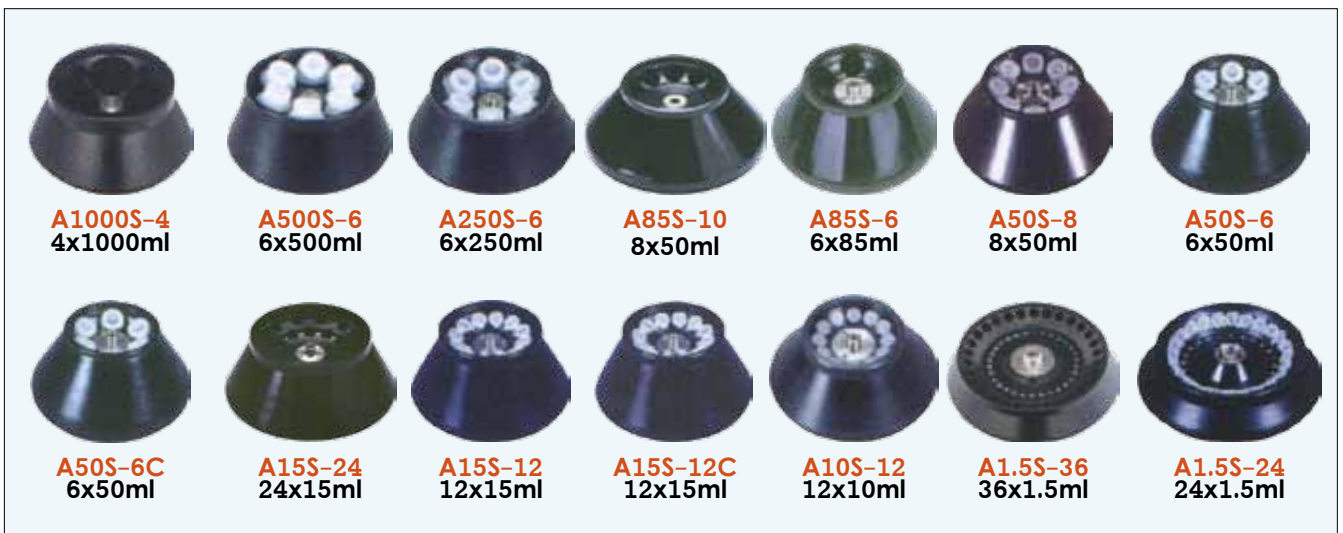


Control Panel

Model	HSCEN-22K
<b>RPM</b>	22,000 rpm
<b>RCF</b>	53,029 xg
<b>Max. capacity</b>	1,000ml x 4
<b>Time</b>	99hrs 59min 59sec
<b>Display</b>	RPM, RCF, Time, Temperature, Program, Temp. Limit, Accel/Decel, Rotor Number, Rotor Radius
<b>Accel/Decel</b>	10 step
<b>Temperature</b>	-10°C ~ 40°C
<b>Motor</b>	AC Induction Motor
<b>Power supply</b>	220V, 60Hz, single phase
<b>Dimension</b>	668W x 801D x 891H/mm
<b>Weight</b>	230Kg

\* Please note that technical specifications subject to change.

**Angle Rotors (more details page 134-136)**





## HSCEN-30K, High Speed Vacuum Centrifuge

High Speed Centrifuge capable of 25,000-30,000 RPM & 4,000ml separation.

### Features:

- One chip microprocessor control
- Easy control of operation
- Well engineered design of motor assures sound quality
- Environmental refrigerating system of CFC-free
- Automatic RPM/RCF calculating system
- Feed-back system of vacuum control system
- Rotor of autoclave endurance
- High vacuum system and the especially flexible driving system of ultra high speed
- Ultra fine structure such as microbe and virus can be treated
- Vacuum pressure is precisely measured by digital gauge.



**Nalgene Tube Sealing Cap**  
10ml, 50ml  
500ml, 1000ml



**Vacuum Pump**  
 $6.7 \times 10^{-2}$  Torr  
60ℓ/min

Model	HSCEN-30K
RPM	30,000 rpm
RCF	98,608 xg
Max. capacity	1,000ml x 4
Time	99hrs 59min 59sec
Display	RPM, RCF, Time, Temperature, Program, Temp. Limit, Accel/Decel, Rotor Number, Rotor Radius, Self Test,  w2dt
Accel/Decel	10 step
Temperature	-10°C ~ 40°C
Motor	AC Induction Motor
Power supply	220V, 60Hz, single phase
Dimension	710W x 1,000D x 1,260H/mm
Weight	330Kg

\* Please note that technical specifications subject to change.

### Contamination Prevention System

Easy cleaning and preventing contamination during use of machine

### Various rotors available

Various rotors and tubes in need usable (1.5ml-1000ml)

### Temp, Limit System

Accurate temperature control by temperature recognition function.

### Angle Rotors (more details page 134-136)





## HSCEN-25K, High Speed Vacuum Centrifuge

High speed and user friendly centrifuge with refrigeration & vacuum system in volume of 4,000ml.

### Features:

- One chip microprocessor control
- Easy control of operation
- Well engineered design of motor assures sound quality
- Environmental refrigerating system of CFC-free
- Automatic RPM/RCF calculating system
- Feed-back vacuum control system
- High vacuum system and especially flexible driving system of ultra high speed
- Vacuum pressure is precisely measured by digital gauge
- New Carbon Fiber Rotor
- HFC R404A with the ODP = 0.0, which contains no chlorine to destroy the ozone layer, is used to reduce environmental impact



**Nalgene Tube Sealing Cap**  
10ml, 50ml  
500ml, 1000ml



**Vacuum Pump**  
 $6.7 \times 10^{-2}$  Torr  
60ℓ/min

Model	HSCEN-25K
RPM	25,000 rpm
RCF	68,478 xg
Max. capacity	1000ml x 4
Time	99hrs 59min 59sec
Display	RPM, RCF, Time, Temperature, Program, Temp. Limit, Accel/Decel, Rotor Number, Rotor Radius, Self Test, $\omega$ 2dt
Accel/Decel	10 step
Temperature	-10°C ~ 40°C
Motor	AC Induction Motor
Power supply	220V, 60Hz, single phase, 3.9KW
Dimension	710W x 1000D x 1260H/mm
Weight	330Kg

### Contamination Prevention System

Easy cleaning and preventing contamination during use of machine

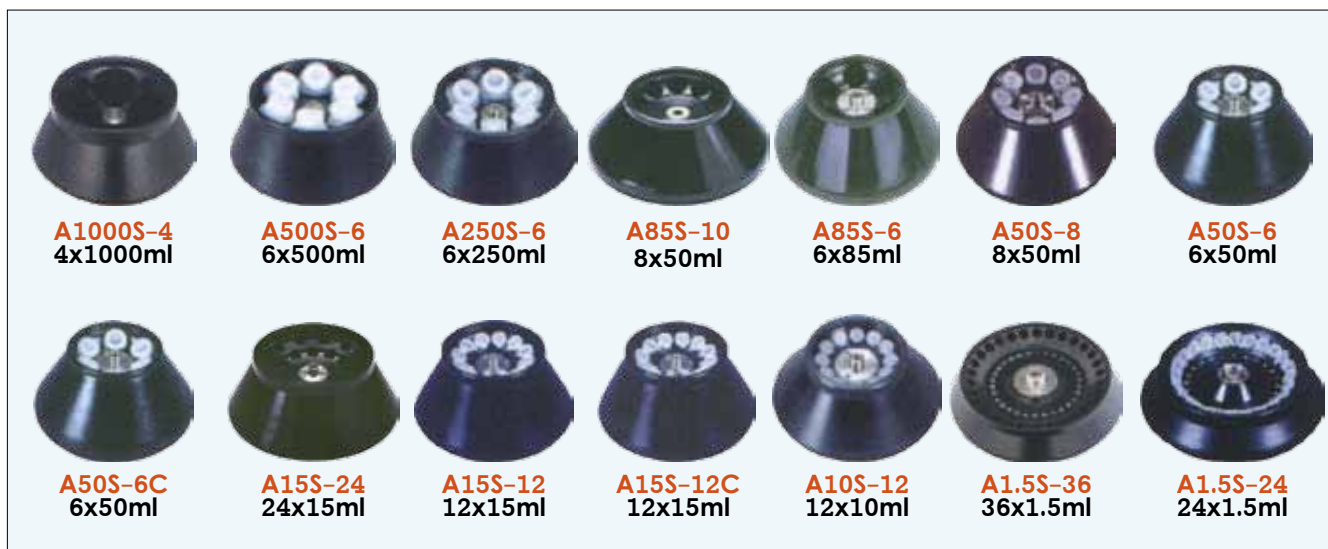
### Various rotors available

Various rotors and tubes in need usable (1.5ml- 1000ml)
















### Temp, Limit System

Accurate temperature control by temperature recognition function.



### Angle Rotors (more details page 134-136)











### Angle Rotors (High Speed Centrifuge)




 <p><b>A1.5S-36</b></p> <p>Type: Angle Rotor &lt;45°C Max. RPM: 20,000rpm Max. RCF: 52,546 xg Radius: 115.7mm</p>	<b>Tube Capacity (ml)</b>	0.2ml	0.5ml	1.5ml	2.0ml	<p><b>HSCEN-17R</b> Max. RPM: 15,000 Max. RCF: 29,104 xg <b>HSCEN-22K</b> Max. RPM: 18,000 Max. RCF: 41,910 xg <b>HSCEN-25K</b> Max. RPM: 20,000 Max. RCF: 51,741 xg <b>HSCEN-30K</b> Max. RPM: 20,000 Max. RCF: 51,741 xg</p>
	<b>Dimensions Ø x L mm</b>	6x18	8x30	11x38	11x38	
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	36				
	<b>Max. RCF</b>	42,573	46,643	52,546		
	<b>radius (mm)</b>	95.2	104.3	115.7		
	<b>boring Ø x L mm</b>	6x21	8x37	11x37.5		
 <p><b>A10S-12</b></p> <p>Type: Angle Rotor &lt;36°C Max. RPM: 30,000rpm Max. RCF: 85,628 xg Radius: 85.1mm</p>	<b>Tube Capacity (ml)</b>	10ml				<p><b>HSCEN-17R</b> Max. RPM: 17,000 Max. RCF: 27,496 xg <b>HSCEN-22K</b> Max. RPM: 22,000 Max. RCF: 46,049 xg <b>HSCEN-25K</b> Max. RPM: 25,000 Max. RCF: 59,464 xg <b>HSCEN-30K</b> Max. RPM: 30,000 Max. RCF: 85,628 xg</p>
	<b>Dimensions Ø x L mm</b>	16x82				
	<b>Tube Type</b>					
	<b>Tube per Rotor</b>	12				
	<b>Max. RCF</b>	85,628				
	<b>radius (mm)</b>	85.1				
	<b>boring Ø x Lmm</b>	16.3x74.5				
 <p><b>A15S-12C</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 17,000rpm Max. RCF: 32,116 xg Radius: 99.4mm</p>	<b>Tube Capacity (ml)</b>	15ml				<p><b>HSCEN-17R</b> Max. RPM: 15,000 Max. RCF: 25,004 xg <b>HSCEN-22K</b> Max. RPM: 17,000 Max. RCF: 32,116 xg <b>HSCEN-25K</b> Max. RPM: 17,000 Max. RCF: 32,116 xg <b>HSCEN-30K</b> Max. RPM: 17,000 Max. RCF: 32,116 xg</p>
	<b>Dimensions Ø x L mm</b>	17x120				
	<b>Tube Type</b>					
	<b>Tube per Rotor</b>	12				
	<b>Max. RCF</b>	32,116				
	<b>radius (mm)</b>	99.4				
	<b>boring Ø x L mm</b>	17x115				
 <p><b>A15S-12</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 30,000rpm Max. RCF: 96,696 xg Radius: 96.1mm</p>	<b>Tube Capacity (ml)</b>	15(16)ml				<p><b>HSCEN-17R</b> Max. RPM: 17,000 Max. RCF: 31,050 xg <b>HSCEN-22K</b> Max. RPM: 22,000 Max. RCF: 52,001xg <b>HSCEN-25K</b> Max. RPM: 25,000 Max. RCF: 67,150 xg <b>HSCEN-30K</b> Max. RPM: 30,000 Max. RCF: 96,696 xg</p>
	<b>Dimensions Ø x L mm</b>	18x100				
	<b>Tube Type</b>					
	<b>Tube per Rotor</b>	12				
	<b>Max. RCF</b>	96,696				
	<b>radius (mm)</b>	96.1				
	<b>boring Ø x Lmm</b>	19x96				
 <p><b>A50S-6C</b></p> <p>Type: Angle Rotor &lt;40°C Max. RPM: 17,000rpm Max. RCF: 29,402 xg Radius: 91mm</p>	<b>Tube Capacity (ml)</b>	50ml				<p><b>HSCEN-17R</b> Max. RPM: 15,000 Max. RCF: 22,891 xg <b>HSCEN-22K</b> Max. RPM: 17,000 Max. RCF: 29,402 xg <b>HSCEN-25K</b> Max. RPM: 17,000 Max. RCF: 29,402 xg <b>HSCEN-30K</b> Max. RPM: 17,000 Max. RCF: 29,402 xg</p>
	<b>Dimensions Ø x L mm</b>	29x115				
	<b>Tube Type</b>					
	<b>Tube per Rotor</b>	6				
	<b>Max. RCF</b>	29,402				
	<b>radius (mm)</b>	91.0				
	<b>boring Ø x Lmm</b>	29.5x108.6				







 <p><b>A50S-6</b></p> <p>Type: Angle Rotor &lt;30°C Max. RPM: 30,000rpm Max. RCF: 96,696 xg Radius: 96.1mm</p>	<b>Tube Capacity (ml)</b>	15(16)ml	50ml	50ml		<p>HSCEN-17R Max. RPM: 17,000 Max. RCF: 31,050 xg HSCEN-22K Max. RPM: 22,000 Max. RCF: 52,001 xg HSCEN-25K Max. RPM: 25,000 Max. RCF: 67,150 xg HSCEN-30K Max. RPM: 30,000 Max. RCF: 96,696 xg</p>
	<b>Dimensions Ø x L mm</b>	18x100	8x30	11x38		
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	6				
	<b>Max. RCF</b>	90,558	96,696			
	<b>radius (mm)</b>	90.0	96			
	<b>boring Ø x L mm</b>	18.5x92	29x100			

 <p><b>A50S-8</b></p> <p>Type: Angle Rotor &lt;36°C Max. RPM: 30,000rpm Max. RCF: 99,513 xg Radius: 98.9mm</p>	<b>Tube Capacity (ml)</b>	15(16)ml	50ml	50ml		<p>HSCEN-17R Max. RPM: 15,000 Max. RCF: 24,878 xg HSCEN-22K Max. RPM: 22,000 Max. RCF: 53,516 xg HSCEN-25K Max. RPM: 25,000 Max. RCF: 67,106 xg HSCEN-30K Max. RPM: 30,000 Max. RCF: 99,513 xg</p>
	<b>Dimensions Ø x L mm</b>	18x100	28.7x104	28.8x107		
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	8				
	<b>Max. RCF</b>	93,375	99,513			
	<b>radius (mm)</b>	92.8	98.9			
	<b>boring Ø x L mm</b>	18.5x92	29x100			

 <p><b>A85S-6</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 25,000rpm Max. RCF: 64,425 xg Radius: 92.2mm</p>	<b>Tube Capacity (ml)</b>	85ml				<p>HSCEN-17R Max. RPM: 15,000 Max. RCF: 23,193 xg HSCEN-22K Max. RPM: 20,000 Max. RCF: 41,232 xg HSCEN-25K Max. RPM: 25,000 Max. RCF: 64,425 xg HSCEN-30K Max. RPM: 25,000 Max. RCF: 64,425 xg</p>
	<b>Dimensions Ø x L mm</b>	38.2x105.7				
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	6				
	<b>Max. RCF</b>	64,425				
	<b>radius (mm)</b>	92.2				
	<b>boring Ø x L mm</b>	38.5x90				

 <p><b>A250S-6</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 14,000rpm Max. RCF: 30,305 xg Radius: 138.3mm</p>	<b>Tube Capacity (ml)</b>	250ml	250ml			<p>HSCEN-22K Max. RPM: 12,000 Max. RCF: 22,265 xg HSCEN-25K Max. RPM: 14,000 Max. RCF: 30,305 xg HSCEN-30K Max. RPM: 14,000 Max. RCF: 30,305 xg</p>
	<b>Dimensions Ø x L mm</b>	61.8x127.7	61.8x134			
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	6				
	<b>Max. RCF</b>	30,305				
	<b>radius (mm)</b>	138.3				
	<b>boring Ø x L mm</b>	62x103				

 <p><b>A500S-6</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 10,000rpm Max. RCF: 17,743 xg Radius: 158.7mm</p>	<b>Tube Capacity (ml)</b>	500ml				<p>HSCEN-22K Max. RPM: 9,000 Max. RCF: 14,372 xg HSCEN-25K Max. RPM: 10,000 Max. RCF: 17,743 xg HSCEN-30K Max. RPM: 10,000 Max. RCF: 17,743 xg</p>
	<b>Dimensions Ø x L mm</b>	69.5x170				
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	6				
	<b>Max. RCF</b>	17,743				
	<b>radius (mm)</b>	158.7				
	<b>boring Ø x L mm</b>	70x141				

 <p><b>A1000S-4</b></p> <p>Type: Angle Rotor &lt;25°C Max. RPM: 8,000rpm Max. RCF: 12,157 xg Radius: 169.9mm</p>	<b>Tube Capacity (ml)</b>	1000ml				<p>HSCEN-22K Max. RPM: 8,000 Max. RCF: 12,157 xg HSCEN-25K Max. RPM: 8,000 Max. RCF: 12,157 xg HSCEN-30K Max. RPM: 8,000 Max. RCF: 12,157 xg</p>
	<b>Dimensions Ø x L mm</b>	96x176				
	<b>Tube Type</b>					
	<b>Adapter</b>					
	<b>Tube per Rotor</b>	4				
	<b>Max. RCF</b>	12,157				
	<b>radius (mm)</b>	169.9				
	<b>boring Ø x L mm</b>	97x144				



**CENBAG-12R**

### Stable Sampling

10 steps for acceleration and deceleration can be selected for delicate liquid experiment

### Eco-friendly cooling system

Eco-friendly & effective cooling with CFC Free freezing system.

### Want perfect blood separation?

Micro Soft Control make good progress on separating layers by minimizing vibration section.



**WS2400-6B**

### CENBAG-12R, Blood Bag Separating Centrifuge

Specialized blood-bag treating centrifuge with bucket style of big capacity, 2,400 ml swing-out rotor.

#### Features:

- Graphic LCD
- Fast and easy operation and correction by Key Pad
- Big capacity 2,400 ml Swing-out rotor of bucket style
- Soft & silent operation
- Memory function for setting the condition of test
- Environmentally refrigerating system of CFC-free
- Automatically calculating RPM/RCF
- 10 steps for acceleration and deceleration can be selected for delicate liquid experiment
- Efficient cooling system
- Wind shield minimizing air resistance
- Specially designed for separating blood platelet in blood bank & hospital or the treatment of big capacity.

Model	CENBAG-12R
<b>RPM</b>	4,800 rpm
<b>RCF</b>	7,212 xg
<b>Max. capacity</b>	2,400ml x 6
<b>Time</b>	99hrs 59min 59sec
<b>Display</b>	RPM, RCF, Time, Temperature, Program, Accel/Decel, Rotor Number, Rotor Radius
<b>Accel/Decel</b>	10 step
<b>Temperature</b>	-10° ~ 40°C
<b>Motor</b>	AC Induction Motor
<b>Power supply</b>	220V, 60Hz, single phase
<b>Dimension</b>	840W x 980D x 970H/mm
<b>Weight</b>	520Kg

\* Please note that technical specifications subject to change.



**CENBAG-R**

### CENBAG-R, Centrifuge for Large Size Sample

Big size refrigerating centrifuge for blood-bag or various tubes.

#### Features:

- Graphic LCD
- Fast and easy operation and correction by Key Pad
- Swing-out rotor of big capacity of 1,000 ml, bucket style
- Soft & silent operation
- Memory function for setting various conditions
- Environmentally refrigerating system of CFC-free
- Automatic RPM/RCF calculating system
- 10 levels of Accel./Decel. is suitable for separation of sensitive layers
- Efficient cooling system
- Wind shield minimizing air resistance
- Specially designed for separating blood platelet in blood bank and hospital or the treatment of big capacity.

Model	CENBAG-R
<b>RPM</b>	5,000 rpm
<b>RCF</b>	7,217 xg
<b>Max. capacity</b>	1,000ml x 6
<b>Time</b>	99hrs 59min 59sec
<b>Display</b>	RPM, RCF, Time, Temperature, Program, Accel/Decel, Rotor Number, Rotor Radius
<b>Accel/Decel</b>	10 step
<b>Temperature</b>	-10° ~ 40°C
<b>Motor</b>	AC Induction Motor
<b>Power supply</b>	220V, 60Hz, single phase
<b>Dimension</b>	700W x 807D x 858H/mm
<b>Weight</b>	380Kg

\* Please note that technical specifications subject to change.



**WS1000-6B**

### Stable Sampling

10 steps for acceleration and deceleration can be selected for delicate liquid experiment.

### Eco-friendly cooling system

Eco-friendly and effective cooling with CFC Free freezing system.











**Optimized chamber for effective cooling**











**Control Display**

- Customized key pad (Easy operation and correction)
- 10 steps for acceleration and deceleration for delicate liquid experiment
- RPM/RCF auto calculating
- Changing term of timer during operation
- Time set up, max. 99 hours 59 minutes 59 secs
- Rotor Radius 0.1 mm setting
- Memory for saving experiment condition [100 memories]

 <b>WS2400-6B</b> Type Swing Rotor $\angle 90^\circ$ Max. RPM 4,800 rpm Max. RCF 7,470 xg Radius 290 mm Dim. for 494x434x120mm	 <b>B2400</b> Blood Bag Bucket 2,400ml Capacity		
	Model	TB-250	TB-450
Tube Capacity(ml)	250	450	500
Tube Type			
Adapter			
Tube per Adapter	2	2	2
Tube per Rotor	12	12	12
Max. RCF	7,212	7,212	7,212
radius (mm)	280	280	280
RPM	4,800	4,800	4,800
Color / Material	Green	Sky Blue	Blue

CENBAG-12R Max. RPM: 4,800 Max. RCF: 7,470 xg

Model	T5-26	T10-26	T15-19	T50-7	T250-1	T500-1	T1000-1	T50-5C	T15-14C	TS50-5	
Tube Capacity (ml)	5	10	15	50	250	500	1000	50	15	50	480
Dimensions $\phi \times L$ mm	12x75	13x100	16x114	29x104	61.8x123	69.5x170.2	97x152	30x115	17x120	-	-
Tube Type											
Adapter											
Tube per Adapter	26	26	19	7	1	1	1	5	14	5	1
Tube per Rotor	156	156	114	42	6	6	6	30	84	30	6
Max. RCF	10,202	10,171	10,215	9,877	10,275	10,259	10,312	10,159	10,066	7,506	9,990
radius (mm)	253.5	252.7	253.8	245.4	255.3	254.9	256.2	252.4	250.1	186.5	248.2
RPM	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
boring $\phi \times L$ mm	13x70	14x89.5	17x99.5	29.2x81	62.2x99	75.5x99	96x153	29.5x99.5	17x89	27x65	-
Color / Material	Magenta	Yellow	Green	White	Cyan	Violet	Chartreuse	Blue	Sky Blue	Black	Black
Max. length $\phi \times L$ mm	13X187.5	14X186.5	17X185	29.2X179.5	62.2X189	75.5X189	96X190	17X86	13X184	27X90	-

Model	T5-30	T10-24	T15-17	T50-4	T250-1	T500-1
Adapter						
Tube per Adapter	30	24	17	4	1	1
Tube per Rotor	180	144	102	24	6	6
Max. RCF	9,897	9,897	9,897	9,897	9,897	9,897
radius (mm)	245.9	245.9	245.9	245.9	245.9	245.9
RPM	6,000	6,000	6,000	6,000	6,000	6,000
boring $\phi \times L$ mm	13X55	13.5X80	17.3X80	29X80	62X80	74X80
Color / Material	Crimson	Yellow	Green	White	Red	Blue
Max. length $\phi \times L$ mm	13x180	13.5x180	17.3x180	29x180	62x180	74x180

LGCEN-514R Max. RPM: 5,000 Max. RCF: 7,217 xg

## 24 Places Hematocrit Centrifuges

Each capillary is secured within its own chamber and supported by a holding tray. This holding tray serves to contain glass shards and any leakage should a tube break. It is easy to clean and disposable in the case of glass breakage. The main area of application for hematocrit centrifuges is the determination of volume fraction of erythrocytes in blood. For this purpose, blood in hematocrit capillaries is centrifuged until maximum packed cell volume has been reached. Following centrifugation, the hematocrit value can be read using a special evaluation disc. Preparing blood for photometric determination of bilirubin content in plasma and centrifuging special capillaries for quantitative Buffy Coat Analysis are further areas of application for this special-purpose centrifuge.



### Features for HCEN-203:

- Digital speed and time display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.



**Rotor Included**

### Features for HCEN-202:

- Manual-breaking system provides rapid deceleration.
- Power pilot light and fuse safety protection.
- Regressive timer: 15 min, with ring device.



**Rotor Included**



Model	HCEN-203	HCEN-202
Max. Speed (rpm)	1,000~12,000	12,000
Max. RCF (g)	14,810	
Max. Capacity (ml)	Hematocrit x 24	
Timer (min:sec)	99:59	0~15 min
Weight (kg)	10	8
W x D x H Size (cm)	29 x 32 x 25	

### Rotor for HCEN-202/203 included



Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
RHT-240	12,000	14,810	Hematocrit x 24	1.1~1.2 x 75



**HCEN-103**

**HCEN-103, 24 Places Rotor Of 1.5ml/2ml Tubes & 24 Places Hematocrit Centrifuge**

Digital Micro Centrifuge HCEN-103 is designed for small specimens. Digital Micro Centrifuge with metal housing is sturdy and durable. Auto-balancing system can extend motor life and reduce noise.

With safety interlock, it can prevent the lid from being opened during operation. Forced fan air convection prevents the motor from overheating. Precision digital timer can be set from 0 ~ 15 minutes 30 sec. increment. HCEN-103 can offer short runs by pressing the function key. LED digital display enable user to monitor the present speed or the remaining time. Automatic brake system can offer rapid deceleration. HCEN-103 features a see-through window. The lid will be opened automatically once the rotor stop spinning.

HCEN-103 is a combo centrifuge with can accommodate micro or micro hematocrit rotors. Quality certificate: ISO 9001, 13485.

**Specifications for Centrifuge:**

Model	Timer	Speed display	Motor	Weight (kg) (N.W./G.W.)	Size(mm) WXDxH
<b>HCEN-103</b>	0~15 min. Digital timer	LED digital display for time and speed	Universal motor	13.0/14.5	290x400x260

**Specifications for Rotors (Included):**

Model	Max. Speed (rpm)	Type	Capacity
<b>HT-24</b>	500~12,000	Disc	24 x capillary tube(Diam.1.5x75mm)
<b>MAR-24</b>	500~12,000	45 degerr angle	24 x (1.5~2.0)ml

Note: Standard percentage reader (aluminum) is a standard accessory for HT-24.



**BLCEN-208**

**BLCEN-208, Immunology Blood Typing Centrifuge**

**Features:**

- Digital speed and time display.
- 10 memory programs for presetting parameters.
- Auto accelerating and decelerating functions.

**Application:**

The identification of blood type, red blood cell and lymph cell cleaning, the handle of blood coagulation, and the separation of lymph cell.

To observe the reaction of blood coagulation, cultivate and separate cell, match blood by intersection, blood separation, and anti-serum globulin test.

Model	Max. Speed (rpm)	Max. RCF (g)	Max. Capacity (ml)	Timer	Weight (kg)	W x D x H Size (cm)
<b>BLCEN-208</b>	4,000	1,600	6x12 of glass tube (Ø12xL75mm)	99:59 (min:sec)	10	29 x 32 x 25
	1 / 2200	480		60 (sec)		
	2 / 3000	900		15 (sec)		
	3 / 3000	900		60 (sec)		

**Rotor for BLCEN-208**



**SERO**  
6ml x 12pcs  
Max. 4,000rpm

**Rotor Included**

Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
<b>SERO</b>	4,000	1,600	6 x 12	12 x 75

# CENTRIFUGES For Plates, For Gel Cards



## MINI-PLATE, Mini-Plate Centrifuge

The compact and economical Mini-PLATE Mini-Plate. It can quickly spin down droplets and condensation and is for use before and after thermal cycling to improve PCR yield.

It accepts skirted, non-skirted and all standard PCR plates making, it's suitable for the molecular laboratory.

### Features:

- Quickly Spin down droplets.
- Use before & after thermal cycling to increase PCR yield.
- Accepts skirted, non-skirted and all standard PCR plates.
- Less than 1/4 the size of most plate centrifuges.



Model	Capacity	Rotor Speed	G Force	Dimensions	Weight	Power
MINI-PLATE	2 PCR Plates	2500rpm	500 xg	20(W)x23(D)x19.3(H)cm	3kg	120V/230V, 50-60HZ



## CEN-ID24, Centrifuge for up to 24 gel cards

### Features:

- Simultaneous centrifuge of up to 24 Gel cards
- Removable and exchangeable spinning head
- Pre-defined centrifugal parameters for optimum Gel cards processing; acceleration, speed, braking and time
- Digital interface visor control and visualization of centrifuge speed and time remaining for processing
- Programmable audible alarms for end of centrifugal time periods.



Model	Capacity	Speed	Max. Speed	Timer	Power	Demensions
CEN-ID24	24 Gel Cards	2 stages (It can be variable according to user need)	1500rpm	0-99min	AC100-240V, 50/60Hz, 50W	D530x W410x H180mm



SPCEN-500

**SPCEN-500, Sulphameter****Features:**

- Easy operation, Auto buzz when time's up.
- Stainless steel chamber and rotor.
- Timer: 0-6 min.
- Auto power off for rotor imbalance.
- Auto power off when door open.

The machine uses centrifugal precipitation to test the density of sulfate in electroplating solution.

Model	Max. Speed (rpm)	Max. RCF (g)	Max. Capacity (ml x pcs)	Timer (min:sec)	Weight (kg)	W x D x H Size (cm)
SPCEN-500	0~1,200	290	100	0~6	35	45 x 56 x 38

Power: AC110/220V, 50/60Hz

**Rotor for SPCEN-500**

**RS-50**  
25ml x 4pcs  
Max. 1,200rpm

**Rotor  
Included**

Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
RS-50	1,200	290	25 x 4	32~34 x 120~152



**Rotor  
Included**

Include:  
8 Gelber Tubes  
of 50ml

CEN-MLKFT-EC

**CEN-MLKFT-EC, Table Top Milk Centrifuge**

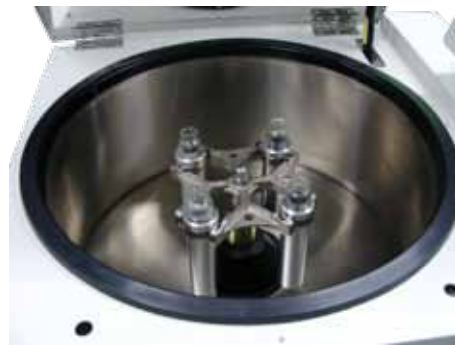
CEN-MLKFT-EC Table Top Milk Centrifuge is a specific for analyzing milk and milk products according to the hygienic standards. It is applicable in such fields as milk and milk products, medicine and pharmacy, biochemistry, and hygienic food to measure the volume or percentage of the fat centrifuged from milk.. CEN-MLKFT-EC Table Top Milk Centrifuge is with heating constant-Temperature functions, is an ideal instrument to be mainly used for physio chemical test in milk industry.



Model	CEN-MLKFT-EC
Max. Speed (rpm)	1,500
Max. RCF (xg)	504
Max. Capacity (ml)	8 Gelber 50ml tube
Max semidiameter	200mm (with Heating)
Operational way of the Rotor	Angle
Power supply	AC220V 50HZ 5A
Timer Range	0~99min
Dimension	L600xW540xH520mm
Weight	55Kg



**OLCEN-501, Oil Test Typed Centrifuges**



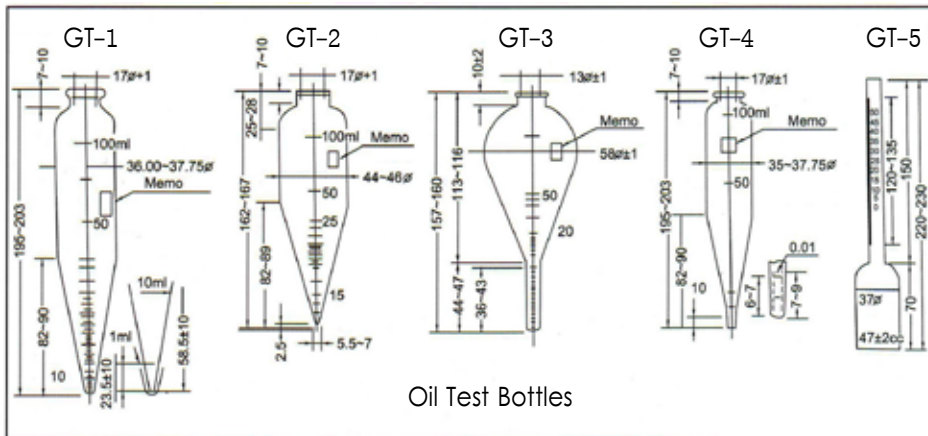
Model	OLCEN-501	OLCEN-502
Max. Speed (rpm)	500~2,000	
Max. RCF (g)	1,070	1,140
Oil test bottle (pcs)	4	8
Timer (min:sec)	99:59	
Weight (kg)	160	
W x D x H Size (cm)	69 x 77 x 104	

Tubes not included AC110/220V, 50/60Hz

**Features:**

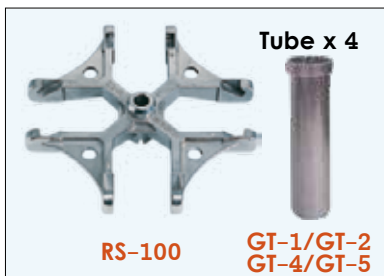
- LED speed, centrifugal force and time display
- 10 memory programs for presetting parameters
- Auto rotor, stepless speed setting
- See-through window.

This machine can be applied to test the water content & sediment in the oil or the insolubility ingredient in the lubricant.



Oil Test Bottles

**OLCEN-501**



RS-100

Tube x 4

GT-1/GT-2  
GT-4/GT-5

**OLCEN-501/502**



RS-104

GT-3  
(Sole GT-3 for RS-104)

**OLCEN-502**



RS-108

Tube x 8

GT-1/GT-2  
GT-4/GT-5

**Rotor for OLCEN-501/502**

Rotor	Max. Speed (rpm)	Max. RCF (g)	Capacity (ml x pcs)	Tube size (Ø x L) mm
RS-100	2,000	1,070	Refer to the above diagram explanation	
RS-104		850		
RS-108		1,140		



BSCEN-600

**BSCEN-600/601/602, Centrifugal Separator (Tripedal Type)**

**Features:**

- For solid and liquid separation.
- The dipping part is in stainless steel SUS304.
- For materials separation in large volume.
- Equipped with 3-point shake-proof device.



BSCEN-600

**BSCEN-600T Teflon Coated**

Teflon coating for getting acid resistance can be requested to do with an extra charge.



Filter bag



**Metal Basket (Small)**  
Ø15cm x H8cm  
(Capacity 0.8L)



**Metal Basket (Medium)**  
Ø24cm x H14cm  
(Capacity 3L)



**Metal Basket (Large)**  
Ø30cm x H16cm  
(Capacity 4.5L)

Model	Max. Speed (rpm)	Max. RCF (g)	Basket Size (cm)	Capacity (Liter)	Weight (kg)	W x D x H Size (cm)
BSCEN-600	0~3,000	1,509	Ø15 x H8	0.8	74	56 x 56 x 60
BSCEN-601			Ø24 x H14	3.0		
BSCEN-602			Ø30 x H16	4.5		



SCF-Series

### SCF-Series, Refrigerated Chillers

• Compact size • Bench Top • Digital setting & readout • Designed and constructed for continuous operation Cool flow SCFs are closed loop refrigerated re circulator designed to replace tap water in water cooled applications, Ideal for: Lasers, GC/MS's, NMR's, Condensers, Power supply, Ultra-centrifuge, Diffusion pump, SEM's-TEM's.

Model	SCF-25	SCF-35	SCF-75
Temp. Working range	+5°C~35°C		
Stability	±0.1°C		
Setting & readout	Digital		
Cooling capacity at 20°C			
Watts	560	950	2100
BTU/hr	1910	3060	7150
Kcal/hr	482	860	1806
Pump	5L/min 3kg/cm <sup>2</sup> (Optional: 18L/min, 4.8kg/cm <sup>2</sup> )		
Reservoir	Ø10.0xL23cm	Ø19.5xL35cm	
Capacity	1.8L	10L	
Overall	W30xD55xH59cm		W42xD62xH67cm
Power source	110/220V 60/50Hz 4A/2A	110/220V 60/50Hz 4.5A/2.25A	110/220V 60/50Hz 5A/2.5A



FIGR-002

### FIGR-Series, Immersion Coolers

The Immersion cooler can be used with open bath circulators to provide a reliable and flexible alternative to tap water cooling. This immersion cooler also provides a simple solution for direct cooling of small samples.

- Wide operating temperature range to meet application needs (down to -30°C).
- Eliminates the inconvenience of handling dry ice or liquid nitrogen, saving both time and money.

Used together with open-water bath circulators, this cooler provides an alternative to tap water cooling.

this cooler is equipped with an air-cooled cooling circuit and is suitable for individual cooling applications like cooling smaller volumes, removing reaction heat or replacing tap water cooling.

temperature range: -30 to 100°C. the HC Series is a cost effective alternative to dry ice. Adding one of our Immersion Coolers or Cold Baths to your laboratory is a wise investment.

Both are designed to eliminate the use of dry ice or liquid nitrogen, and feature durable, heavy-duty refrigeration



systems that can operate continuously without trouble.

If you calculate the cost of buying a year's worth of dry ice or LN 2 and compare it with the cost of running either, you'll be pleasantly surprised. 3 available to meet your application needs. See the specification table below for cooling probe options. Immersion Coolers are primarily used for counter-cooling when connected to a heating circulator, or for rapidly cooling fluids down to low temperatures. Take advantage of the space-saving design. Immersion Coolers represent an economical alternative to conventional tap water cooling. Ease of operation make this model Series the ideal instruments for a variety of cooling applications.

#### Advantages:

- Rapid cooling of liquids to low temp.
- Counter cooling of liquids in combination with open bath circulators
- Preventing the use of precious tap water for cooling
- Ease of operation
- Compact design, small footprint
- Much safer & consistent than dry-ice.

Model	FIGR-001	FIGR-002	FIGR-003
Working range	Ambient ~ -20°C	Ambient ~ -30°C	Ambient ~ -30°C
Cooling capacity (at 20°C)	750Kcal/hr	1000Kcal/hr	1500Kcal/hr
Probe	Φ5.1x13.2cm	Φ5.1x20cm	Φ5.1x20cm
Case (mm)	W230xD305xH450	W230xD320xH500	W230xD320xH500
Power source	110/220V 60/50Hz 3/1.5A	110/220V 60/50Hz 3.5/2A	110/220V 60/50Hz 4A/2A





CWA-Series

**CWA-Series, Medium/Large Chillers**

**Application:**

- UV printing machine and cooling for ink roller
- High-cycle machine
- PU foam machine
- Injection molding machine
- Blow molding machine
- Ultrasonic cleaning equipment
- All kind of industrial equipment.

**Features:**

- Using the heat exchanger of plate type & shell & tube evaporator to increase the heat exchange.
- It's easy to install and maintain. Water tower is not required.
- Advanced electrical components, energy saving & increasing deadline.
- Digital control panel with precision  $\pm 0.5^{\circ}\text{C} \sim \pm 1.0^{\circ}\text{C}$ .
- The temperature range is  $15^{\circ}\text{C} \sim 30^{\circ}\text{C}$  and can set arbitrarily.
- Filling the high-efficiency environmental refrigerant to avoid pollution.



CWA-12



CWA-8 Back

Model		CWA-01	CWA-04	CWA-08	CWA-12	CWA-24	CWA-36	CWA-60	CWA-90	CWA-120
Cooling capacity	BTU/HR	1000	4000	8000	12000	24000	36000	60000	90000	120000
	KCAL/HR	250	1000	2000	3000	6000	9000	15000	22500	30000
Power source	V	1Ø AC220V 50/60Hz or 3Ø AC220V 50/60Hz								
Total overburdening current consumption	A	3.6	5.6	6.8	7.2	11.7	20	27	44.5	52
Water pump horsepower	HP	1/3	1/3	1/2	1/2	1	1.7	1.8	3	4
Water pump discharge rate	l/min	20	20	30	30	30	50	60	90	120
Water tank	Liter	7	10	26	26	45	65	90	100	130
Inlet and outlet pipe-diameter	inch	1/2"x1/2"		3/4"x3/4"		1"x1"			1-1/4"x1-1/4"	
CWA DIM.	D	366	366	518	675	926	1105	956		
	W	444	444	506	545	606	705	1306		
	H	526.5	879	969	1265	1247	1347	1892		
Refrigerant	gas	R134A/R407c								
CWA Weight	kg	44	70	90	94	141	182	310	440	570
CWW Weight	kg	44	68	88	91	145	172	298	410	550



## GC3400, Gas Chromatograph

### Applications:

GC3400 Gas Chromatograph, made according to international standards, its technical feature and index are in the world high level. The key components are imported from world famous suppliers. It is widely used for petrol-chemistry, environmental protection, epidemic prevention, pharmacology, scientific research, etc.

### Features:

#### ● Self-diagnostic function:

- 1) Core tests; 2) Automatic tests; 3) Extended tests; 4) Basic tests;
- Monitor the status of GC continuously. Once finding faults, it'll display the information and show the wrong zone and the settling method.

#### ● Self-protective function:

- 1) Overrun temperature protection; 2) Short circuit hint; 3) TCD filament protection; 4) FID flameout hint; 5) PFD exposed-light protection; 6) Keyboard locking with password; etc., ensuring normal running

#### ● Simple operation, powerful automation:

1) All parameters can be entered through keyboard with prompt function; 2) 4 sets of complete chromatography analysis methods can be stored and recalled automatically; An auto sampler can be connected; Parameters can be modified instantly while the GC is running; 5) Chromatography analysis method can be activated for 99 times repeatedly at the same time. It's especially suitable for unattended operation

#### ● More choices of injectors:

1) On-Column Injector for Packed Column; 2) Flash Vaporization Injector for Packed Column 3) Automatic or manual gas inject valve; 4) Headspace sampler; 5) Thermal desorption system 6) Split/Splitless Capillary Injector; Three Injectors or two Split/Splitless Capillary Injectors can be fixed on GC

#### ● More choices of detectors:

1) TCD; 2) FID; 3) ECD; 4) FPD; 5) TSD Maximum of two TCDs or three different kinds of detectors can be installed

#### ● Reactor:

1) Internal; 2) external

#### ● Time programming of detectors:

Each of detectors has 5-ramp programmable time control. Output-signal, attenuation range, and polarity can be set automatically

#### ● Time programming of external events:

Providing 4 external events with 20-ramp, programmable time control. The optional GC relays may be used to automate valves, operate split/splitless capillary injectors, drive auxiliary devices, or switch signals between detector A and detector B in a run

#### ● Many kind of special-purpose GC can be provided according to user's request.

### Specifications:

#### ● Column oven:

Operating temperature range: ambient temperature to 420°C; Dual opening-door at the back of column oven; Cooling time: 250°C to 50°C in 5 min; Programmable oven with 4-ramp temperature control; Temperature programming rate 0.1-50°C/min.

#### ● Injector system:

Operating temperature range: ambient temperature to 420°C

#### ● Thermal conductivity detector -TCD:

Maximum temperature: 420°C  
Sensitivity:  $\geq 12000 \text{mv} \cdot \text{mL/mg}$  (for butane)  
Linear range:  $10^5$   
Current range: 50 to 400mA

#### ● Filament protection:

If He or H<sub>2</sub> carrier gas flow in the detector cell is cut off for 4 minutes, filament power will be shut off automatically.

#### ● Flame ionization detector-FID:

Maximum temperature: 420°C  
Minimum detectivity:  $\leq 1.3 \times 10^{-12} \text{g/s}$  ( $n\text{-C}_{16}$ )  
Linear range:  $10^7$   
Flameout hint: monitoring the status of GC continuously after being turned on.

#### ● Electron capture detector-ECD:

Maximum temperature: 420°C  
Minimum detectivity:  $\leq 0.1 \text{pg/mL}$  ( $\gamma\text{-666}$ )  
Linear range:  $10^4$   
Emission source:  $^{63}\text{Ni}$

#### ● Flame photometric detector-FPD:

Maximum temperature: 420°C  
Minimum detectivity:  
[P]  $\leq 1 \times 10^{-12} \text{g/s}$  (tributyl phosphate)  
[S]  $\leq 1 \times 10^{-10} \text{g/s}$  (p-methylsulfurphosphorous)  
Linear range: [P]:  $10^5$  [S]:  $10^3$   
Two air-hydrogen flames: For large volume injection or trace sample injection analyses;  
Single air-hydrogen flame: sulfur sensitivity can be increased;  
Direct output: for phosphorus or sulfur analyses;  
Square-root output: for sulfur analyses;  
Exposed-light protection:  
When exposed-light current is more than 12pA, high voltage will be cut off automatically.

#### ● Nitrogen-phosphorus detector-TSD:

Maximum temperature: 420°C  
Minimum detectivity:  
[N]  $\leq 1 \times 10^{-13} \text{g/s}$  (azobenzene)  
[P]  $\leq 5 \times 10^{-14} \text{g/s}$  (malathion)  
Linear range: [N]:  $10^5$  [P]:  $10^4$



### GC3420A, Gas Chromatograph

#### Features:

- **Self-diagnostic function:**
  - 1) Core tests; 2) Automatic tests; 3) Extended tests; 4) Basic tests; Monitor the status of GC continuously. Once finding faults, it'll display the information and show the wrong zone and the settling method.
- **Self-protective function:**
  - 1) Overrun temperature protection; 2) Short circuit hint; 3) TCD filament protection; 4) FID flameout hint; 5) PFD exposed-light protection; 6) Keyboard locking with password; etc., ensuring normal running.
- **Simple operation, powerful automation:**
  - 1) All parameters can be entered through keyboard with prompt function; 2) 4 sets of complete chromatography analysis methods can be stored and recalled automatically; 3) An auto sampler can be connected; 4) Parameters can be modified instantly while the GC is running; 5) Chromatography analysis method can be activated for 99 times repeatedly at the same time its especially suitable for unattended operation.
- **More choices of injectors:**
  - 1) TCD; 2) FID; 3) ECD; 4) FPD 5) TSD

Maximum of two TCDs or three different kinds of detectors can be installed.
- **Reactor:**
  - 1) Internal; 2) external • Time programming of detectors: Each of detectors has 5-ramp programmable time control. Output-signal, attenuation range, and polarity

can be set automatically.

- **Time programming of external events:**

Providing 4 external events with 20-ramp programmable time control.

The optional GC relays may be used to automate valves, operate split/ splitless capillary injectors, drive auxiliary devices, or switch signals between detector A and detector B in a run.

- **Many kind of special-purpose GC can be provided according to user's request.**

#### Specifications:

- **Column oven:**

Operating temperature range: ambient temperature to 400°C;  
Dual opening-door at the back of column oven;  
Cooling time: 250°C to 50°C in 5 min;  
Programmable oven with 4-ramp temperature control;  
Temperature programming rate: 0.1~50°C/min

- **Injector system:**

Operating temperature range: ambient temperature to 400°C

- **Thermal conductivity detector -TCD:**

Maximum temperature: 400°C  
Sensitivity:  $\geq 10000 \text{mv} \cdot \text{mL/mg}$  (for butane)  
Linear range:  $10^5$   
Current range: 50 to 400mA

- **Filament protection:**

If He or H<sub>2</sub> carrier gas flow in the detector cell is cut off for 4 minutes, filament power will be shut off automatically.

- **Flame ionization detector-FID:**

Maximum temperature: 400°C  
Minimum detectivity:  $\leq 5 \times 10^{-12} \text{g/s}$  (n-C<sub>16</sub>)  
Linear range:  $10^7$   
Flameout hint: monitoring the status of GC continuously after being turned on.

- **Electron capture detector-ECD:**

Maximum temperature: 400°C  
Minimum detectivity:  $\leq 0.1 \text{pg/mL}$  (y-666)  
Linear range:  $10^4$   
Emission source: 11 mC<sup>63</sup>Ni

- **Flame photometric detector-FPD:**

Maximum temperature 400°C  
Minimum detectivity:  
[P]  $\leq 2 \times 10^{-12} \text{g/s}$  (tributyl phosphate)  
[S]  $\leq 2 \times 10^{-10} \text{g/s}$  (p-methylsulfurphosharous)  
Linear range: [P]: $10^5$  [S]:  $10^3$   
Two air-hydrogen flames: For large volume injection or trace sample injection analyses;  
Single air-hydrogen flame: sulfur sensitivity can be increased;  
Direct output: for phosphorus or sulfur analyses;  
Square-root output: for sulfur analyses;  
Exposed-light protection:  
When exposed-light current is more than 12pA, high voltage will be cut off automatically.

- **Nitrogen-phosphorus detector-TSD:**

Maximum temperature: 400°C  
Minimum detectivity:  
[N]  $\leq 2 \times 10^{-13} \text{g/s}$  (azobenzene)  
[P]  $\leq 1 \times 10^{-13} \text{g/s}$  (malathion)  
Linear range: [N]: $10^5$  [P]:  $10^4$ .



## HPLC8100, High Performance Liquid Chromatograph

### Description:

- Scientific and reasonable function and structure design satisfy your needs for accuracy and reproducibility to the maximum.
- Building-block modular design enables easy use and convenient maintenance.
- Rich function PC control and chromatograph data processing software make it simple for instrument control and data processing.

### Innovation:

- High pressure solvent delivery pump adopting electronic pulsation suppression technology displacing traditional mechanical buffer to thoroughly solve the problem caused by frequent leakage of mechanical buffer, and to reduce the dead volume of solvent delivery system to the minimum
- The wavelength positioning of Multi-wavelength UV-Vis detector is realized via the grating's turning which is directly controlled by the SCM (Single Chip Micryoco). It takes place the conventional sine-pole mechanism (monochromator), eliminating the error of wavelength positioning brought by the mechanical abrasion and returning error of the Guide-screw transmission, and also avoiding the monochromator's hitting accident which might be brought by false operation.

### Performance:

#### High pressure pump:

- Advanced double-piston pump and electronic residual technique, greatly improves the flow rate precision and repeatability of the pump.
- Flow rate range: 0.001 —9.999mL/min in 0.001mL/min increments
- Structure: double-piston pump
- Flow rate precision: <0.5%
- Repeatability: <0.1%
- Pulsation: <0.04MPa
- Pressure range: 0~40MPa
- Gradient mode:
  - Low pressure gradient system up to 4 solvents and High pressure gradient system up to 2 solvents
- Remote control: RS-232 connector. PC control
- System protection: Soft Start, P min and P max adjustable
- Display: LCD , 2x16
- Dimensions (WxHxD): 350x190x210 mm.

#### Column Oven:

- Highest temperature establishing, overrun temperature alarming.
- Temperature control range: ambient - 100°C
- Temperature accuracy:  $\pm 0.3.0$
- Safety setting-up: overrun temperature limit alarming
- Display: 4 bits LED (red-actual temperature, green-establishing temperature)
- Column: 2
- Remote control: RS-232 connector, PC control
- Inside dimensions (WxHxD): 50x380x50 mm
- Outside dimensions (WxHxD): 120x500x230 mm.

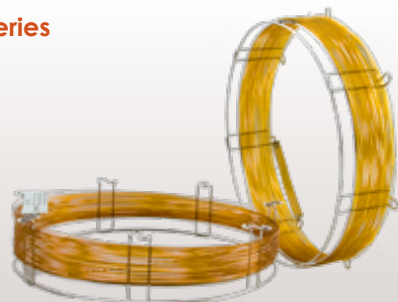
#### UV-Vis Detector:

- Time-programmed wavelength change function, realizing online wavelength switch.
- Baseline drift:  $15 \times 10^{-5}$  AU/h at 240nm.  $t=1.0s$
- Structure: double-piston pump
- Baseline noise:  $2 \times 10^{-5}$  AU at 240nm,  $t=1.0s$
- Wavelength range: 190~740nm. LA5-8rIM
- Wavelength accuracy:  $\pm 1$ nm
- Time constants: 0.1/0.2/0.5/1.0/2.0/5.0/10.0
- Analog output:  $\pm 1$ V
- Auto-zero range: full scale
- Light source: deuterium lamp
- Display: LCD , 2x16
- Dimensions (WxHxD): 350x190x210 mm.

#### PC control and Chromatograph data processing system:

- Complete PC control function, realizing parameter control and real-time monitoring to all parts, including column oven.
- Interface language can be switched between Chinese and English, with simple operation.
- Analytical task can be completed in single sampling, with automatic processing of chromatograph data and obtaining perfect spectra.
- Backstage operation function enables data processing to the existing spectra, while analysis is going on.
- The gradient program of the pump and wavelength time-program of the detector can be established.
- The test report format can be easily edited.
- Timer turn-off function is provided.

## GC-Series



Model	Description
GC-1.096125.0001	CD-PONA capillary column (50m x 0.2mm x 0.5um)
GC-1.096155.0001	CD-PONA capillary column (100m x 0.25mm x 0.5um)
GC-1.103220.0001	CD-WAX capillary column (15m x 0.25mm x 0.25um)
GC-1.103221.0001	CD-WAX capillary column (30m x 0.25mm x 0.25um)
GC-1.103222.0001	CD-WAX capillary column (30m x 0.25mm x 0.5um)
GC-1.103223.0001	CD-WAX capillary column (30m x 0.25mm x 1.0um)
GC-1.103224.0001	CD-WAX capillary column (60m x 0.25mm x 0.25um)
GC-1.103225.0001	CD-WAX capillary column (60m x 0.25mm x 1.0um)
GC-1.103226.0001	CD-WAX capillary column (100m x 0.25mm x 0.25um)
GC-1.103227.0001	CD-WAX capillary column (15m x 0.32mm x 0.25um)
GC-1.103228.0001	CD-WAX capillary column (30m x 0.32mm x 0.25um)
GC-1.103229.0001	CD-WAX capillary column (30m x 0.32mm x 0.5um)
GC-1.103230.0001	CD-WAX capillary column (30m x 0.32mm x 1.0um)
GC-1.103231.0001	CD-WAX capillary column (30m x 0.32mm x 3.0um)
GC-1.103232.0001	CD-WAX capillary column (30m x 0.32mm x 5.0um)
GC-1.103233.0001	CD-WAX capillary column (60m x 0.32mm x 0.25um)
GC-1.103234.0001	CD-WAX capillary column (60m x 0.32mm x 0.5um)
GC-1.103235.0001	CD-WAX capillary column (60m x 0.32mm x 1.0um)
GC-1.103236.0001	CD-WAX capillary column (60m x 0.32mm x 3.0um)
GC-1.103237.0001	CD-WAX capillary column (60m x 0.32mm x 5.0um)
GC-1.103238.0001	CD-WAX capillary column (15m x 0.53mm x 0.5um)
GC-1.103239.0001	CD-WAX capillary column (15m x 0.53mm x 1.0um)
GC-1.103240.0001	CD-WAX capillary column (15m x 0.53mm x 1.5um)
GC-1.103241.0001	CD-WAX capillary column (15m x 0.53mm x 3.0um)
GC-1.103242.0001	CD-WAX capillary column (30m x 0.53mm x 0.5um)
GC-1.103243.0001	CD-WAX capillary column (30m x 0.53mm x 1.0um)
GC-1.103244.0001	CD-WAX capillary column (30m x 0.53mm x 1.5um)
GC-1.103245.0001	CD-WAX capillary column (30m x 0.53mm x 3.0um)
GC-1.103246.0001	CD-WAX capillary column (30m x 0.53mm x 5.0um)

Model	Description
GC-1.103247.0001	CD-WAX capillary column (50m x 0.53mm x 0.5um)
GC-1.103248.0001	CD-WAX capillary column (50m x 0.53mm x 2.65um)
GC-1.103249.0001	CD-WAX capillary column (50m x 0.53mm x 5.0um)
GC-1.103250.0001	CD-WAX capillary column (60m x 0.53mm x 0.5um)
GC-1.103251.0001	CD-WAX capillary column (60m x 0.53mm x 1.0um)
GC-1.103252.0001	CD-WAX capillary column (60m x 0.53mm x 1.5um)
GC-1.103253.0001	CD-WAX capillary column (60m x 0.53mm x 3.0um)
GC-1.103254.0001	CD-WAX capillary column (60m x 0.53mm x 5.0um)
GC-1.120310.0001	CD-1 capillary column (15m x 0.25mm x 0.25um)
GC-1.120312.0001	CD-1 capillary column (30m x 0.25mm x 0.25um)
GC-1.120313.0001	CD-1 capillary column (30m x 0.25mm x 0.5um)
GC-1.120314.0001	CD-1 capillary column (30m x 0.25mm x 1.0um)
GC-1.120315.0001	CD-1 capillary column (60m x 0.25mm x 0.25um)
GC-1.120316.0001	CD-1 capillary column (60m x 0.25mm x 1.0um)
GC-1.120317.0001	CD-1 capillary column (100m x 0.25mm x 0.25um)
GC-1.120318.0001	CD-1 capillary column (15m x 0.32mm x 0.25um)
GC-1.120319.0001	CD-1 capillary column (30m x 0.32mm x 0.25um)
GC-1.120320.0001	CD-1 capillary column (30m x 0.32mm x 0.5um)
GC-1.120321.0001	CD-1 capillary column (30m x 0.32mm x 1.0um)
GC-1.120322.0001	CD-1 capillary column (30m x 0.32mm x 3.0um)
GC-1.120323.0001	CD-1 capillary column (30m x 0.32mm x 5.0um)
GC-1.120324.0001	CD-1 capillary column (60m x 0.32mm x 0.25um)
GC-1.120325.0001	CD-1 capillary column (60m x 0.32mm x 0.5um)
GC-1.120326.0001	CD-1 capillary column (60m x 0.32mm x 1.0um)
GC-1.120327.0001	CD-1 capillary column (60m x 0.32mm x 3.0um)
GC-1.120328.0001	CD-1 capillary column (60m x 0.32mm x 5.0um)
GC-1.120329.0001	CD-1 capillary column (15m x 0.53mm x 0.5um)
GC-1.120330.0001	CD-1 capillary column (15m x 0.53mm x 1.0um)
GC-1.120331.0001	CD-1 capillary column (15m x 0.53mm x 1.5um)
GC-1.120332.0001	CD-1 capillary column (15m x 0.53mm x 3.0um)
GC-1.120333.0001	CD-1 capillary column (30m x 0.53mm x 0.5um)
GC-1.120334.0001	CD-1 capillary column (30m x 0.53mm x 1.0um)
GC-1.120335.0001	CD-1 capillary column (30m x 0.53mm x 1.5um)
GC-1.120336.0001	CD-1 capillary column (30m x 0.53mm x 3.0um)
GC-1.120337.0001	CD-1 capillary column (30m x 0.53mm x 5.0um)
GC-1.120338.0001	CD-1 capillary column (50m x 0.53mm x 0.5um)
GC-1.120339.0001	CD-1 capillary column (50m x 0.53mm x 2.65um)

Model	Description
GC-1.120340.0001	CD-1 capillary column (50m x 0.53mm x 5.0um)
GC-1.120341.0001	CD-1 capillary column (60m x 0.53mm x 0.5um)
GC-1.120342.0001	CD-1 capillary column (60m x 0.53mm x 1.0um)
GC-1.120343.0001	CD-1 capillary column (60m x 0.53mm x 1.5um)
GC-1.120344.0001	CD-1 capillary column (60m x 0.53mm x 3.0um)
GC-1.120345.0001	CD-1 capillary column (60m x 0.53mm x 5.0um)
GC-1.130121.0001	CD-1301 capillary column (15m x 0.25mm x 0.25um)
GC-1.130122.0001	CD-1301 capillary column (30m x 0.25mm x 0.25um)
GC-1.130123.0001	CD-1301 capillary column (30m x 0.25mm x 0.5um)
GC-1.130124.0001	CD-1301 capillary column (30m x 0.25mm x 1.0um)
GC-1.130125.0001	CD-1301 capillary column (60m x 0.25mm x 0.25um)
GC-1.130126.0001	CD-1301 capillary column (60m x 0.25mm x 1.0um)
GC-1.130127.0001	CD-1301 capillary column (100m x 0.25mm x 0.25um)
GC-1.130128.0001	CD-1301 capillary column (15m x 0.32mm x 0.25um)
GC-1.130129.0001	CD-1301 capillary column (30m x 0.32mm x 0.25um)
GC-1.130130.0001	CD-1301 capillary column (30m x 0.32mm x 0.5um)
GC-1.130131.0001	CD-1301 capillary column (30m x 0.32mm x 1.0um)
GC-1.130132.0001	CD-1301 capillary column (30m x 0.32mm x 3.0um)
GC-1.130133.0001	CD-1301 capillary column (30m x 0.32mm x 5.0um)
GC-1.130134.0001	CD-1301 capillary column (60m x 0.32mm x 0.25um)
GC-1.130135.0001	CD-1301 capillary column (60m x 0.32mm x 0.5um)
GC-1.130136.0001	CD-1301 capillary column (60m x 0.32mm x 1.0um)
GC-1.130137.0001	CD-1301 capillary column (60m x 0.32mm x 3.0um)
GC-1.130138.0001	CD-1301 capillary column (60m x 0.32mm x 5.0um)
GC-1.130139.0001	CD-1301 capillary column (15m x 0.53mm x 0.5um)
GC-1.130140.0001	CD-1301 capillary column (15m x 0.53mm x 1.0um)
GC-1.130141.0001	CD-1301 capillary column (15m x 0.53mm x 1.5um)
GC-1.130142.0001	CD-1301 capillary column (15m x 0.53mm x 3.0um)
GC-1.130143.0001	CD-1301 capillary column (30m x 0.53mm x 0.5um)
GC-1.130144.0001	CD-1301 capillary column (30m x 0.53mm x 1.0um)
GC-1.130146.0001	CD-1301 capillary column (30m x 0.53mm x 3.0um)
GC-1.130147.0001	CD-1301 capillary column (30m x 0.53mm x 5.0um)
GC-1.130148.0001	CD-1301 capillary column (50m x 0.53mm x 0.5um)
GC-1.130149.0001	CD-1301 capillary column (50m x 0.53mm x 2.65um)
GC-1.130150.0001	CD-1301 capillary column (50m x 0.53mm x 5.0um)

Model	Description
GC-1.130151.0001	CD-1301 capillary column (60m x 0.53mm x 0.5um)
GC-1.130152.0001	CD-1301 capillary column (60m x 0.53mm x 1.0um)
GC-1.130153.0001	CD-1301 capillary column (60m x 0.53mm x 1.5um)
GC-1.130154.0001	CD-1301 capillary column (60m x 0.53mm x 3.0um)
GC-1.130155.0001	CD-1301 capillary column (60m x 0.53mm x 5.0um)
GC-1.154631.0001	CD-1MS capillary column (15m x 0.25mm x 0.25um)
GC-1.154632.0001	CD-1MS capillary column (30m x 0.25mm x 0.25um)
GC-1.154633.0001	CD-1MS capillary column (30m x 0.25mm x 0.5um)
GC-1.154634.0001	CD-1MS capillary column (30m x 0.25mm x 1.0um)
GC-1.154635.0001	CD-1MS capillary column (60m x 0.25mm x 0.25um)
GC-1.154636.0001	CD-1MS capillary column (60m x 0.25mm x 1.0um)
GC-1.154637.0001	CD-1MS capillary column (100m x 0.25mm x 0.25um)
GC-1.154638.0001	CD-1MS capillary column (15m x 0.32mm x 0.25um)
GC-1.154639.0001	CD-1MS capillary column (30m x 0.32mm x 0.25um)
GC-1.154640.0001	CD-1MS capillary column (30m x 0.32mm x 0.5um)
GC-1.154641.0001	CD-1MS capillary column (30m x 0.32mm x 1.0um)
GC-1.154642.0001	CD-1MS capillary column (30m x 0.32mm x 3.0um)
GC-1.154643.0001	CD-1MS capillary column (30m x 0.32mm x 5.0um)
GC-1.154644.0001	CD-1MS capillary column (60m x 0.32mm x 0.25um)
GC-1.154645.0001	CD-1MS capillary column (60m x 0.32mm x 0.5um)
GC-1.154646.0001	CD-1MS capillary column (60m x 0.32mm x 1.0um)
GC-1.154647.0001	CD-1MS capillary column (60m x 0.32mm x 3.0um)
GC-1.154648.0001	CD-1MS capillary column (60m x 0.32mm x 5.0um)
GC-1.154649.0001	CD-1MS capillary column (15m x 0.53mm x 0.5um)
GC-1.154650.0001	CD-1MS capillary column (15m x 0.53mm x 1.0um)
GC-1.154651.0001	CD-1MS capillary column (15m x 0.53mm x 1.5um)
GC-1.154652.0001	CD-1MS capillary column (15m x 0.53mm x 3.0um)
GC-1.154653.0001	CD-1MS capillary column (30m x 0.53mm x 0.5um)
GC-1.154654.0001	CD-1MS capillary column (30m x 0.53mm x 1.0um)
GC-1.154655.0001	CD-1MS capillary column (30m x 0.53mm x 1.5um)
GC-1.154656.0001	CD-1MS capillary column (30m x 0.53mm x 3.0um)
GC-1.154657.0001	CD-1MS capillary column (30m x 0.53mm x 5.0um)
GC-1.154658.0001	CD-1MS capillary column (50m x 0.53mm x 0.5um)
GC-1.154659.0001	CD-1MS capillary column (50m x 0.53mm x 2.65um)
GC-1.154660.0001	CD-1MS capillary column (50m x 0.53mm x 5.0um)
GC-1.154661.0001	CD-1MS capillary column (60m x 0.53mm x 0.5um)

Model	Description
GC-1.154662.0001	CD-1MS capillary column (60m x 0.53mm x 1.0um)
GC-1.154663.0001	CD-1MS capillary column (60m x 0.53mm x 1.5um)
GC-1.154664.0001	CD-1MS capillary column (60m x 0.53mm x 3.0um)
GC-1.154664.0001	CD-1MS capillary column (60m x 0.53mm x 3.0um)
GC-1.154665.0001	CD-1MS capillary column (60m x 0.53mm x 5.0um)
GC-1.170171.0001	CD-1701 capillary column (15m x 0.25mm x 0.25um)
GC-1.170172.0001	CD-1701 capillary column (30m x 0.25mm x 0.25um)
GC-1.170173.0001	CD-1701 capillary column (30m x 0.25mm x 0.5um)
GC-1.170174.0001	CD-1701 capillary column (30m x 0.25mm x 1.0um)
GC-1.170175.0001	CD-1701 capillary column (60m x 0.25mm x 0.25um)
GC-1.170176.0001	CD-1701 capillary column (60m x 0.25mm x 1.0um)
GC-1.170177.0001	CD-1701 capillary column (100m x 0.25mm x 0.25um)
GC-1.170178.0001	CD-1701 capillary column (15m x 0.32mm x 0.25um)
GC-1.170179.0001	CD-1701 capillary column (30m x 0.32mm x 0.25um)
GC-1.170180.0001	CD-1701 capillary column (30m x 0.32mm x 0.5um)
GC-1.170181.0001	CD-1701 capillary column (30m x 0.32mm x 1.0um)
GC-1.170182.0001	CD-1701 capillary column (30m x 0.32mm x 3.0um)
GC-1.170183.0001	CD-1701 capillary column (30m x 0.32mm x 5.0um)
GC-1.170184.0001	CD-1701 capillary column (60m x 0.32mm x 0.25um)
GC-1.170185.0001	CD-1701 capillary column (60m x 0.32mm x 0.5um)
GC-1.170186.0001	CD-1701 capillary column (60m x 0.32mm x 1.0um)
GC-1.170187.0001	CD-1701 capillary column (60m x 0.32mm x 3.0um)
GC-1.170188.0001	CD-1701 capillary column (60m x 0.32mm x 5.0um)
GC-1.170189.0001	CD-1701 capillary column (15m x 0.53mm x 0.5um)
GC-1.170190.0001	CD-1701 capillary column (15m x 0.53mm x 1.0um)
GC-1.170191.0001	CD-1701 capillary column (15m x 0.53mm x 1.5um)
GC-1.170192.0001	CD-1701 capillary column (15m x 0.53mm x 3.0um)
GC-1.170193.0001	CD-1701 capillary column (30m x 0.53mm x 0.5um)
GC-1.170194.0001	CD-1701 capillary column (30m x 0.53mm x 1.0um)
GC-1.170195.0001	CD-1701 capillary column (30m x 0.53mm x 1.5um)
GC-1.170196.0001	CD-1701 capillary column (30m x 0.53mm x 3.0um)
GC-1.170197.0001	CD-1701 capillary column (30m x 0.53mm x 5.0um)
GC-1.170198.0001	CD-1701 capillary column (50m x 0.53mm x 0.5um)
GC-1.170199.0001	CD-1701 capillary column (50m x 0.53mm x 2.65um)
GC-1.170200.0001	CD-1701 capillary column (50m x 0.53mm x 5.0um)

Model	Description
GC-1.170201.0001	CD-1701 capillary column (60m x 0.53mm x 0.5um)
GC-1.170202.0001	CD-1701 capillary column (60m x 0.53mm x 1.0um)
GC-1.170203.0001	CD-1701 capillary column (60m x 0.53mm x 1.5um)
GC-1.170204.0001	CD-1701 capillary column (60m x 0.53mm x 3.0um)
GC-1.170205.0001	CD-1701 capillary column (60m x 0.53mm x 5.0um)
GC-1.210991.0001	CD-210 capillary column (15m x 0.25mm x 0.25um)
GC-1.210992.0001	CD-210 capillary column (30m x 0.25mm x 0.25um)
GC-1.210993.0001	CD-210 capillary column (30m x 0.25mm x 0.5um)
GC-1.210994.0001	CD-210 capillary column (30m x 0.25mm x 1.0um)
GC-1.210995.0001	CD-210 capillary column (60m x 0.25mm x 0.25um)
GC-1.210996.0001	CD-210 capillary column (60m x 0.25mm x 1.0um)
GC-1.210997.0001	CD-210 capillary column (100m x 0.25mm x 0.25um)
GC-1.210998.0001	CD-210 capillary column (15m x 0.32mm x 0.25um)
GC-1.210999.0001	CD-210 capillary column (30m x 0.32mm x 0.25um)
GC-1.211000.0001	CD-210 capillary column (30m x 0.32mm x 0.5um)
GC-1.211001.0001	CD-210 capillary column (30m x 0.32mm x 1.0um)
GC-1.211002.0001	CD-210 capillary column (30m x 0.32mm x 3.0um)
GC-1.211003.0001	CD-210 capillary column (30m x 0.32mm x 5.0um)
GC-1.211004.0001	CD-210 capillary column (60m x 0.32mm x 0.25um)
GC-1.211005.0001	CD-210 capillary column (60m x 0.32mm x 0.5um)
GC-1.211006.0001	CD-210 capillary column (60m x 0.32mm x 1.0um)
GC-1.211007.0001	CD-210 capillary column (60m x 0.32mm x 3.0um)
GC-1.211008.0001	CD-210 capillary column (60m x 0.32mm x 5.0um)
GC-1.211009.0001	CD-210 capillary column (15m x 0.53mm x 0.5um)
GC-1.211010.0001	CD-210 capillary column (15m x 0.53mm x 1.0um)
GC-1.211011.0001	CD-210 capillary column (15m x 0.53mm x 1.5um)
GC-1.211012.0001	CD-210 capillary column (15m x 0.53mm x 3.0um)
GC-1.211013.0001	CD-210 capillary column (30m x 0.53mm x 0.5um)
GC-1.211014.0001	CD-210 capillary column (30m x 0.53mm x 1.0um)
GC-1.211015.0001	CD-210 capillary column (30m x 0.53mm x 1.5um)
GC-1.211016.0001	CD-210 capillary column (30m x 0.53mm x 3.0um)
GC-1.211017.0001	CD-210 capillary column (30m x 0.53mm x 5.0um)
GC-1.211018.0001	CD-210 capillary column (50m x 0.53mm x 0.5um)
GC-1.211019.0001	CD-210 capillary column (50m x 0.53mm x 2.65um)
GC-1.211020.0001	CD-210 capillary column (50m x 0.53mm x 5.0um)

Model	Description
GC-1.211021.0001	CD-210 capillary column (60m x 0.53mm x 0.5um)
GC-1.211022.0001	CD-210 capillary column (60m x 0.53mm x 1.0um)
GC-1.211023.0001	CD-210 capillary column (60m x 0.53mm x 1.5um)
GC-1.211024.0001	CD-210 capillary column (60m x 0.53mm x 3.0um)
GC-1.211025.0001	CD-210 capillary column (60m x 0.53mm x 5.0um)
GC-1.225101.0001	CD-225 capillary column (15m x 0.25mm x 0.25um)
GC-1.225102.0001	CD-225 capillary column (30m x 0.25mm x 0.25um)
GC-1.225103.0001	CD-225 capillary column (30m x 0.25mm x 0.5um)
GC-1.225104.0001	CD-225 capillary column (30m x 0.25mm x 1.0um)
GC-1.225105.0001	CD-225 capillary column (60m x 0.25mm x 0.25um)
GC-1.225106.0001	CD-225 capillary column (60m x 0.25mm x 1.0um)
GC-1.225107.0001	CD-225 capillary column (100m x 0.25mm x 0.25um)
GC-1.225108.0001	CD-225 capillary column (15m x 0.32mm x 0.25um)
GC-1.225109.0001	CD-225 capillary column (30m x 0.32mm x 0.25um)
GC-1.225110.0001	CD-225 capillary column (30m x 0.32mm x 0.5um)
GC-1.225111.0001	CD-225 capillary column (30m x 0.32mm x 1.0um)
GC-1.225112.0001	CD-225 capillary column (30m x 0.32mm x 3.0um)
GC-1.225113.0001	CD-225 capillary column (30m x 0.32mm x 5.0um)
GC-1.225114.0001	CD-225 capillary column (60m x 0.32mm x 0.25um)
GC-1.225115.0001	CD-225 capillary column (60m x 0.32mm x 0.50um)
GC-1.225116.0001	CD-225 capillary column (60m x 0.32mm x 1.0um)
GC-1.225117.0001	CD-225 capillary column (60m x 0.32mm x 3.0um)
GC-1.225118.0001	CD-225 capillary column (60m x 0.32mm x 5.0um)
GC-1.225119.0001	CD-225 capillary column (15m x 0.53mm x 0.5um)
GC-1.225120.0001	CD-225 capillary column (15m x 0.53mm x 1.0um)
GC-1.225121.0001	CD-225 capillary column (15m x 0.53mm x 1.5um)
GC-1.225122.0001	CD-225 capillary column (15m x 0.53mm x 3.0um)
GC-1.225123.0001	CD-225 capillary column (30m x 0.53mm x 0.5um)
GC-1.225124.0001	CD-225 capillary column (30m x 0.53mm x 1.0um)
GC-1.225125.0001	CD-225 capillary column (30m x 0.53mm x 1.5um)
GC-1.225126.0001	CD-225 capillary column (30m x 0.53mm x 3.0um)
GC-1.225127.0001	CD-225 capillary column (30m x 0.53mm x 5.0um)
GC-1.225128.0001	CD-225 capillary column (50m x 0.53mm x 0.5um)
GC-1.225129.0001	CD-225 capillary column (50m x 0.53mm x 2.65um)
GC-1.225130.0001	CD-225 capillary column (50m x 0.53mm x 5.0um)

Model	Description
GC-1.225131.0001	CD-225 capillary column (60m x 0.53mm x 0.5um)
GC-1.225132.0001	CD-225 capillary column (60m x 0.53mm x 1.0um)
GC-1.225133.0001	CD-225 capillary column (60m x 0.53mm x 1.5um)
GC-1.225134.0001	CD-225 capillary column (60m x 0.53mm x 3.0um)
GC-1.225135.0001	CD-225 capillary column (60m x 0.53mm x 5.0um)
GC-1.232415.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (15m x 0.32mm x 10um)
GC-1.232416.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (30m x 0.32mm x 10um)
GC-1.232417.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (50m x 0.32mm x 10um)
GC-1.232418.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (15m x 0.53mm x 20um)
GC-1.232419.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (30m x 0.53mm x 20um)
GC-1.232420.0001	CD-AL <sub>2</sub> O <sub>3</sub> /Na <sub>2</sub> SO <sub>4</sub> capillary column (50m x 0.53mm x 20um)
GC-1.232422.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (15m x 0.32mm x 10um)
GC-1.232423.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (30m x 0.32mm x 10um)
GC-1.232424.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (50m x 0.32mm x 10um)
GC-1.232425.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (15m x 0.53mm x 20um)
GC-1.232426.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (30m x 0.53mm x 20um)
GC-1.232427.0001	CD-AL <sub>2</sub> O <sub>3</sub> /KCl capillary column (50m x 0.53mm x 20um)
GC-1.232429.0001	CD-Molesieve capillary column (15m x 0.32mm x 10um)
GC-1.232431.0001	CD-Molesieve capillary column (50m x 0.32mm x 10um)
GC-1.232432.0001	CD-Molesieve capillary column (15m x 0.53mm x 20um)
GC-1.232433.0001	CD-Molesieve capillary column (30m x 0.53mm x 20um)
GC-1.232434.0001	CD-Molesieve capillary column (50m x 0.53mm x 20um)
GC-1.232436.0001	CD-PLOT Q capillary column (15m x 0.32mm x 10um)
GC-1.232437.0001	CD-PLOT Q capillary column (30m x 0.32mm x 10um)
GC-1.232438.0001	CD-PLOT Q capillary column (50m x 0.32mm x 10um)
GC-1.232439.0001	CD-PLOT Q capillary column (15m x 0.53mm x 20um)
GC-1.232440.0001	CD-PLOT Q capillary column (15m x 0.53mm x 20um)
GC-1.232441.0001	CD-PLOT Q capillary column (15m x 0.53mm x 20um)
GC-1.232443.0001	CD-PLOT U capillary column (15m x 0.32mm x 10um)
GC-1.232444.0001	CD-PLOT U capillary column (30m x 0.32mm x 10um)
GC-1.232445.0001	CD-PLOT U capillary column (50m x 0.32mm x 10um)
GC-1.232446.0001	CD-PLOT U capillary column (15m x 0.53mm x 20um)
GC-1.232447.0001	CD-PLOT U capillary column (30m x 0.53mm x 20um)
GC-1.232448.0001	CD-PLOT U capillary column (50m x 0.53mm x 20um)
GC-1.288710.0001	CD-2887 capillary column (5m x 0.53mm x 1.0um)



Model	Description
GC-1.288711.0001	CD-2887 capillary column (5m x 0.53mm x 3.0um)
GC-1.288712.0001	CD-2887 capillary column (10m x 0.53mm x 0.1um)
GC-1.288713.0001	CD-2887 capillary column (10m x 0.53mm x 0.5um)
GC-1.288714.0001	CD-2887 capillary column (10m x 0.53mm x 1.0um)
GC-1.288715.0001	CD-2887 capillary column (10m x 0.53mm x 3.0um)
GC-1.302510.0001	CD-VOC capillary column (30m x 0.25mm x 1.0um)
GC-1.302511.0001	CD-VOC capillary column (60m x 0.25mm x 1.0um)
GC-1.302512.0001	CD-VOC capillary column (30m x 0.32mm x 1.0um)
GC-1.302513.0001	CD-VOC capillary column (30m x 0.32mm x 1.8um)
GC-1.302514.0001	CD-VOC capillary column (60m x 0.32mm x 1.0um)
GC-1.302515.0001	CD-VOC capillary column (60m x 0.32mm x 1.8um)
GC-1.302516.0001	CD-VOC capillary column (100m x 0.32mm x 1.0um)
GC-1.302517.0001	CD-VOC capillary column (100m x 0.32mm x 1.8um)
GC-1.302518.0001	CD-VOC capillary column (30m x 0.53mm x 1.5um)
GC-1.302519.0001	CD-VOC capillary column (30m x 0.53mm x 3.0um)
GC-1.302520.0001	CD-VOC capillary column (60m x 0.53mm x 1.5um)
GC-1.302521.0001	CD-VOC capillary column (60m x 0.53mm x 3.0um)
GC-1.302522.0001	CD-VOC capillary column (100m x 0.53mm x 1.5um)
GC-1.302523.0001	CD-VOC capillary column (100m x 0.53mm x 3.0um)
GC-1.355341.0001	CD-35 capillary column (15m x 0.25mm x 0.25um)
GC-1.355342.0001	CD-35 capillary column (30m x 0.25mm x 0.25um)
GC-1.355343.0001	CD-35 capillary column (30m x 0.25mm x 0.5um)
GC-1.355344.0001	CD-35 capillary column (30m x 0.25mm x 1.0um)
GC-1.355345.0001	CD-35 capillary column (60m x 0.25mm x 0.25um)
GC-1.355346.0001	CD-35 capillary column (60m x 0.25mm x 1.0um)
GC-1.355347.0001	CD-35 capillary column (100m x 0.25mm x 0.25um)
GC-1.355348.0001	CD-35 capillary column (15m x 0.32mm x 0.25um)
GC-1.355349.0001	CD-35 capillary column (30m x 0.32mm x 0.25um)
GC-1.355350.0001	CD-35 capillary column (30m x 0.32mm x 0.5um)
GC-1.355351.0001	CD-35 capillary column (30m x 0.32mm x 1.0um)
GC-1.355352.0001	CD-35 capillary column (30m x 0.32mm x 3.0um)
GC-1.355353.0001	CD-35 capillary column (30m x 0.32mm x 5.0um)
GC-1.355354.0001	CD-35 capillary column (60m x 0.32mm x 0.25um)
GC-1.355355.0001	CD-35 capillary column (60m x 0.32mm x 0.5um)
GC-1.355356.0001	CD-35 capillary column (60m x 0.32mm x 1.0um)

Model	Description
GC-1.355357.0001	CD-35 capillary column (60m x 0.32mm x 3.0um)
GC-1.355358.0001	CD-35 capillary column (60m x 0.32mm x 5.0um)
GC-1.355359.0001	CD-35 capillary column (15m x 0.53mm x 0.5um)
GC-1.355360.0001	CD-35 capillary column (15m x 0.53mm x 1.0um)
GC-1.355361.0001	CD-35 capillary column (15m x 0.53mm x 1.5um)
GC-1.355362.0001	CD-35 capillary column (15m x 0.53mm x 3.0um)
GC-1.355363.0001	CD-35 capillary column (30m x 0.53mm x 0.5um)
GC-1.355364.0001	CD-35 capillary column (30m x 0.53mm x 1.0um)
GC-1.355365.0001	CD-35 capillary column (30m x 0.53mm x 1.5um)
GC-1.355366.0001	CD-35 capillary column (30m x 0.53mm x 3.0um)
GC-1.355367.0001	CD-35 capillary column (30m x 0.53mm x 5.0um)
GC-1.355368.0001	CD-35 capillary column (50m x 0.53mm x 0.5um)
GC-1.355369.0001	CD-35 capillary column (50m x 0.53mm x 2.65um)
GC-1.355370.0001	CD-35 capillary column (50m x 0.53mm x 5.0um)
GC-1.355371.0001	CD-35 capillary column (60m x 0.53mm x 0.5um)
GC-1.355372.0001	CD-35 capillary column (60m x 0.53mm x 1.0um)
GC-1.355373.0001	CD-35 capillary column (60m x 0.53mm x 1.5um)
GC-1.355374.0001	CD-35 capillary column (60m x 0.53mm x 3.0um)
GC-1.355375.0001	CD-35 capillary column (60m x 0.53mm x 5.0um)
GC-1.355411.0001	CD-35MS capillary column (15m x 0.25mm x 0.25um)
GC-1.355412.0001	CD-35MS capillary column (30m x 0.25mm x 0.25um)
GC-1.355413.0001	CD-35MS capillary column (30m x 0.25mm x 0.5um)
GC-1.355414.0001	CD-35MS capillary column (30m x 0.25mm x 1.0um)
GC-1.355415.0001	CD-35MS capillary column (60m x 0.25mm x 0.25um)
GC-1.355416.0001	CD-35MS capillary column (60m x 0.25mm x 1.0um)
GC-1.355417.0001	CD-35MS capillary column (100m x 0.25mm x 0.25um)
GC-1.355418.0001	CD-35MS capillary column (15m x 0.32mm x 0.25um)
GC-1.355419.0001	CD-35MS capillary column (30m x 0.32mm x 0.25um)
GC-1.355420.0001	CD-35MS capillary column (30m x 0.32mm x 0.5um)
GC-1.355421.0001	CD-35MS capillary column (30m x 0.32mm x 1.0um)
GC-1.355422.0001	CD-35MS capillary column (30m x 0.32mm x 3.0um)
GC-1.355423.0001	CD-35MS capillary column (30m x 0.32mm x 5.0um)
GC-1.355424.0001	CD-35MS capillary column (60m x 0.32mm x 0.25um)
GC-1.355425.0001	CD-35MS capillary column (60m x 0.32mm x 0.5um)
GC-1.355426.0001	CD-35MS capillary column (60m x 0.32mm x 1.0um)

Model	Description
GC-1.355427.0001	CD-35MS capillary column (60m x 0.32mm x 3.0um)
GC-1.355428.0001	CD-35MS capillary column (60m x 0.32mm x 5.0um)
GC-1.355429.0001	CD-35MS capillary column (15m x 0.53mm x 0.5um)
GC-1.355430.0001	CD-35MS capillary column (15m x 0.53mm x 1.0um)
GC-1.355431.0001	CD-35MS capillary column (15m x 0.53mm x 1.5um)
GC-1.355432.0001	CD-35MS capillary column (15m x 0.53mm x 3.0um)
GC-1.355433.0001	CD-35MS capillary column (30m x 0.53mm x 0.5um)
GC-1.355434.0001	CD-35MS capillary column (30m x 0.53mm x 1.0um)
GC-1.355435.0001	CD-35MS capillary column (30m x 0.53mm x 1.5um)
GC-1.355436.0001	CD-35MS capillary column (30m x 0.53mm x 3.0um)
GC-1.355437.0001	CD-35MS capillary column (30m x 0.53mm x 5.0um)
GC-1.355438.0001	CD-35MS capillary column (50m x 0.53mm x 0.5um)
GC-1.355439.0001	CD-35MS capillary column (50m x 0.53mm x 2.65um)
GC-1.355440.0001	CD-35MS capillary column (50m x 0.53mm x 5.0um)
GC-1.355441.0001	CD-35MS capillary column (60m x 0.53mm x 0.5um)
GC-1.355442.0001	CD-35MS capillary column (60m x 0.53mm x 1.0um)
GC-1.355443.0001	CD-35MS capillary column (60m x 0.53mm x 1.5um)
GC-1.355444.0001	CD-35MS capillary column (60m x 0.53mm x 3.0um)
GC-1.355445.0001	CD-35MS capillary column (60m x 0.53mm x 5.0um)
GC-1.448134.0001	CD-ACIDWAX capillary column (15m x 0.25mm x 0.25um)
GC-1.448135.0001	CD-ACIDWAX capillary column (30m x 0.25mm x 0.25um)
GC-1.448136.0001	CD-ACIDWAX capillary column (30m x 0.25mm x 0.5um)
GC-1.448137.0001	CD-ACIDWAX capillary column (30m x 0.25mm x 1.0um)
GC-1.448138.0001	CD-ACIDWAX capillary column (60m x 0.25mm x 0.25um)
GC-1.448139.0001	CD-ACIDWAX capillary column (60m x 0.25mm x 1.0um)
GC-1.448140.0001	CD-ACIDWAX capillary column (100m x 0.25mm x 0.25um)
GC-1.448141.0001	CD-ACIDWAX capillary column (15m x 0.32mm x 0.25um)
GC-1.448142.0001	CD-ACIDWAX capillary column (30m x 0.32mm x 0.25um)
GC-1.448143.0001	CD-ACIDWAX capillary column (30m x 0.32mm x 0.5um)
GC-1.448144.0001	CD-ACIDWAX capillary column (30m x 0.32mm x 1.0um)
GC-1.448145.0001	CD-ACIDWAX capillary column (30m x 0.32mm x 3.0um)
GC-1.448146.0001	CD-ACIDWAX capillary column (30m x 0.32mm x 5.0um)
GC-1.448147.0001	CD-ACIDWAX capillary column (60m x 0.32mm x 0.25um)
GC-1.448148.0001	CD-ACIDWAX capillary column (60m x 0.32mm x 0.5um)
GC-1.448149.0001	CD-ACIDWAX capillary column (60m x 0.32mm x 1.0um)

Model	Description
GC-1.448150.0001	CD-ACIDWAX capillary column (60m x 0.32mm x 3.0um)
GC-1.448151.0001	CD-ACIDWAX capillary column (60m x 0.32mm x 5.0um)
GC-1.448152.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 0.5um)
GC-1.448153.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 1.0um)
GC-1.448154.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 1.5um)
GC-1.448155.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 3.0um)
GC-1.448156.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 0.5um)
GC-1.448157.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 1.0um)
GC-1.448158.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 1.5um)
GC-1.448159.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 3.0um)
GC-1.448160.0001	CD-ACIDWAX capillary column (15m x 0.53mm x 5.0um)
GC-1.448161.0001	CD-ACIDWAX capillary column (50m x 0.53mm x 0.5um)
GC-1.448162.0001	CD-ACIDWAX capillary column (50m x 0.53mm x 2.65um)
GC-1.448163.0001	CD-ACIDWAX capillary column (50m x 0.53mm x 5.0um)
GC-1.448164.0001	CD-ACIDWAX capillary column (60m x 0.53mm x 0.5um)
GC-1.448165.0001	CD-ACIDWAX capillary column (60m x 0.53mm x 1.0um)
GC-1.448166.0001	CD-ACIDWAX capillary column (60m x 0.53mm x 1.5um)
GC-1.448167.0001	CD-ACIDWAX capillary column (60m x 0.53mm x 3.0um)
GC-1.448168.0001	CD-ACIDWAX capillary column (60m x 0.53mm x 5.0um)
GC-1.501221.0001	CD-50 capillary column (15m x 0.25mm x 0.25um)
GC-1.501222.0001	CD-50 capillary column (30m x 0.25mm x 0.25um)
GC-1.501223.0001	CD-50 capillary column (30m x 0.25mm x 0.5um)
GC-1.501224.0001	CD-50 capillary column (30m x 0.25mm x 1.0um)
GC-1.501225.0001	CD-50 capillary column (60m x 0.25mm x 0.25um)
GC-1.501226.0001	CD-50 capillary column (60m x 0.25mm x 1.0um)
GC-1.501227.0001	CD-50 capillary column (100m x 0.25mm x 0.25um)
GC-1.501228.0001	CD-50 capillary column (15m x 0.32mm x 0.25um)
GC-1.501229.0001	CD-50 capillary column (30m x 0.32mm x 0.25um)
GC-1.501230.0001	CD-50 capillary column (30m x 0.32mm x 0.5um)
GC-1.501231.0001	CD-50 capillary column (30m x 0.32mm x 1.0um)
GC-1.501232.0001	CD-50 capillary column (30m x 0.32mm x 3.0um)
GC-1.501233.0001	CD-50 capillary column (30m x 0.32mm x 5.0um)
GC-1.501224.0001	CD-50 capillary column (30m x 0.25mm x 1.0um)
GC-1.501225.0001	CD-50 capillary column (60m x 0.25mm x 0.25um)
GC-1.501226.0001	CD-50 capillary column (60m x 0.25mm x 1.0um)
GC-1.501227.0001	CD-50 capillary column (100m x 0.25mm x 0.25um)

Model	Description
GC-1.501228.0001	CD-50 capillary column (15m x 0.32mm x 0.25um)
GC-1.501229.0001	CD-50 capillary column (30m x 0.32mm x 0.25um)
GC-1.501230.0001	CD-50 capillary column (30m x 0.32mm x 0.5um)
GC-1.501231.0001	CD-50 capillary column (30m x 0.32mm x 1.0um)
GC-1.501232.0001	CD-50 capillary column (30m x 0.32mm x 3.0um)
GC-1.501233.0001	CD-50 capillary column (30m x 0.32mm x 5.0um)
GC-1.501234.0001	CD-50 capillary column (60m x 0.32mm x 0.25um)
GC-1.501235.0001	CD-50 capillary column (60m x 0.32mm x 0.50um)
GC-1.501236.0001	CD-50 capillary column (60m x 0.32mm x 1.0um)
GC-1.501237.0001	CD-50 capillary column (60m x 0.32mm x 3.0um)
GC-1.501238.0001	CD-50 capillary column (60m x 0.32mm x 5.0um)
GC-1.501239.0001	CD-50 capillary column (15m x 0.53mm x 0.5um)
GC-1.501240.0001	CD-50 capillary column (15m x 0.53mm x 1.0um)
GC-1.501241.0001	CD-50 capillary column (15m x 0.53mm x 1.5um)
GC-1.501242.0001	CD-50 capillary column (15m x 0.53mm x 3.0um)
GC-1.501243.0001	CD-50 capillary column (30m x 0.53mm x 0.5um)
GC-1.501244.0001	CD-50 capillary column (30m x 0.53mm x 1.0um)
GC-1.501245.0001	CD-50 capillary column (30m x 0.53mm x 1.5um)
GC-1.501246.0001	CD-50 capillary column (30m x 0.53mm x 3.0um)
GC-1.501247.0001	CD-50 capillary column (30m x 0.53mm x 5.0um)
GC-1.501248.0001	CD-50 capillary column (50m x 0.53mm x 0.5um)
GC-1.501249.0001	CD-50 capillary column (50m x 0.53mm x 2.65um)
GC-1.501250.0001	CD-50 capillary column (50m x 0.53mm x 5.0um)
GC-1.501251.0001	CD-50 capillary column (60m x 0.53mm x 0.5um)
GC-1.501252.0001	CD-50 capillary column (60m x 0.53mm x 1.0um)
GC-1.501253.0001	CD-50 capillary column (60m x 0.53mm x 1.5um)
GC-1.501254.0001	CD-50 capillary column (60m x 0.53mm x 3.0um)
GC-1.501255.0001	CD-50 capillary column (60m x 0.53mm x 5.0um)
GC-1.521510.0001	CD-5 capillary column (15m x 0.25mm x 0.25um)
GC-1.521511.0001	CD-5 capillary column (30m x 0.25mm x 0.25um)
GC-1.521512.0001	CD-5 capillary column (30m x 0.25mm x 0.5um)
GC-1.521513.0001	CD-5 capillary column (30m x 0.25mm x 1.0um)
GC-1.521514.0001	CD-5 capillary column (60m x 0.25mm x 0.25um)
GC-1.521515.0001	CD-5 capillary column (60m x 0.25mm x 1.0um)
GC-1.521516.0001	CD-5 capillary column (100m x 0.25mm x 0.25um)
GC-1.521517.0001	CD-5 capillary column (15m x 0.32mm x 0.25um)

Model	Description
GC-1.521518.0001	CD-5 capillary column (30m x 0.32mm x 0.25um)
GC-1.521519.0001	CD-5 capillary column (30m x 0.32mm x 0.5um)
GC-1.521520.0001	CD-5 capillary column (30m x 0.32mm x 1.0um)
GC-1.521521.0001	CD-5 capillary column (30m x 0.32mm x 3.0um)
GC-1.521522.0001	CD-5 capillary column (30m x 0.32mm x 5.0um)
GC-1.521523.0001	CD-5 capillary column (60m x 0.32mm x 0.25um)
GC-1.521524.0001	CD-5 capillary column (60m x 0.32mm x 0.5um)
GC-1.521525.0001	CD-5 capillary column (60m x 0.32mm x 1.0um)
GC-1.521526.0001	CD-5 capillary column (60m x 0.32mm x 3.0um)
GC-1.521527.0001	CD-5 capillary column (60m x 0.32mm x 5.0um)
GC-1.521528.0001	CD-5 capillary column (15m x 0.53mm x 0.5um)
GC-1.521529.0001	CD-5 capillary column (15m x 0.53mm x 1.0um)
GC-1.521530.0001	CD-5 capillary column (15m x 0.53mm x 1.5um)
GC-1.521531.0001	CD-5 capillary column (15m x 0.53mm x 3.0um)
GC-1.521532.0001	CD-5 capillary column (30m x 0.53mm x 0.5um)
GC-1.521533.0001	CD-5 capillary column (30m x 0.53mm x 1.0um)
GC-1.521534.0001	CD-5 capillary column (30m x 0.53mm x 1.5um)
GC-1.521535.0001	CD-5 capillary column (30m x 0.53mm x 3.0um)
GC-1.521536.0001	CD-5 capillary column (30m x 0.53mm x 5.0um)
GC-1.521537.0001	CD-5 capillary column (50m x 0.53mm x 0.5um)
GC-1.521538.0001	CD-5 capillary column (50m x 0.53mm x 2.65um)
GC-1.521539.0001	CD-5 capillary column (50m x 0.53mm x 5.0um)
GC-1.521540.0001	CD-5 capillary column (60m x 0.53mm x 0.5um)
GC-1.521541.0001	CD-5 capillary column (60m x 0.53mm x 1.0um)
GC-1.521542.0001	CD-5 capillary column (60m x 0.53mm x 1.5um)
GC-1.521543.0001	CD-5 capillary column (60m x 0.53mm x 3.0um)
GC-1.521544.0001	CD-5 capillary column (60m x 0.53mm x 5.0um)
GC-1.548168.0001	CD-BASEWAX capillary column (15m x 0.25mm x 0.25um)
GC-1.548169.0001	CD-BASEWAX capillary column (30m x 0.25mm x 0.25um)
GC-1.548170.0001	CD-BASEWAX capillary column (30m x 0.25mm x 0.5um)
GC-1.548171.0001	CD-BASEWAX capillary column (30m x 0.25mm x 1.0um)
GC-1.548172.0001	CD-BASEWAX capillary column (60m x 0.25mm x 0.25um)
GC-1.548173.0001	CD-BASEWAX capillary column (60m x 0.25mm x 1.0um)
GC-1.548174.0001	CD-BASEWAX capillary column (100m x 0.25mm x 0.25um)
GC-1.548175.0001	CD-BASEWAX capillary column (15m x 0.32mm x 0.25um)
GC-1.548176.0001	CD-BASEWAX capillary column (30m x 0.32mm x 0.25um)

Model	Description
GC-1.548177.0001	CD-BASEWAX capillary column (30m x 0.32mm x 0.5um)
GC-1.548178.0001	CD-BASEWAX capillary column (30m x 0.32mm x 1.0um)
GC-1.548179.0001	CD-BASEWAX capillary column (30m x 0.32mm x 3.0um)
GC-1.548180.0001	CD-BASEWAX capillary column (30m x 0.32mm x 5.0um)
GC-1.548181.0001	CD-BASEWAX capillary column (60m x 0.32mm x 0.25um)
GC-1.548182.0001	CD-BASEWAX capillary column (60m x 0.32mm x 0.5um)
GC-1.548183.0001	CD-BASEWAX capillary column (60m x 0.32mm x 1.0um)
GC-1.548184.0001	CD-BASEWAX capillary column (60m x 0.32mm x 3.0um)
GC-1.548185.0001	CD-BASEWAX capillary column (60m x 0.32mm x 5.0um)
GC-1.548186.0001	CD-BASEWAX capillary column (15m x 0.53mm x 0.5um)
GC-1.548187.0001	CD-BASEWAX capillary column (15m x 0.53mm x 1.0um)
GC-1.548188.0001	CD-BASEWAX capillary column (15m x 0.53mm x 1.5um)
GC-1.548189.0001	CD-BASEWAX capillary column (15m x 0.53mm x 3.0um)
GC-1.548190.0001	CD-BASEWAX capillary column (15m x 0.53mm x 0.5um)
GC-1.548191.0001	CD-BASEWAX capillary column (15m x 0.53mm x 1.0um)
GC-1.548192.0001	CD-BASEWAX capillary column (15m x 0.53mm x 1.5um)
GC-1.548193.0001	CD-BASEWAX capillary column (15m x 0.53mm x 3.0um)
GC-1.548194.0001	CD-BASEWAX capillary column (15m x 0.53mm x 5.0um)
GC-1.548195.0001	CD-BASEWAX capillary column (50m x 0.53mm x 0.5um)
GC-1.548196.0001	CD-BASEWAX capillary column (50m x 0.53mm x 2.65um)
GC-1.548197.0001	CD-BASEWAX capillary column (50m x 0.53mm x 5.0um)
GC-1.548198.0001	CD-BASEWAX capillary column (60m x 0.53mm x 0.5um)
GC-1.548199.0001	CD-BASEWAX capillary column (60m x 0.53mm x 1.0um)
GC-1.548200.0001	CD-BASEWAX capillary column (60m x 0.53mm x 1.5um)
GC-1.548201.0001	CD-BASEWAX capillary column (60m x 0.53mm x 3.0um)
GC-1.548202.0001	CD-BASEWAX capillary column (60m x 0.53mm x 5.0um)
GC-1.554420.0001	CD-5MS capillary column (15m x 0.25mm x 0.25um)
GC-1.554421.0001	CD-5MS capillary column (30m x 0.25mm x 0.25um)
GC-1.554422.0001	CD-5MS capillary column (30m x 0.25mm x 0.5um)
GC-1.554423.0001	CD-5MS capillary column (30m x 0.25mm x 1.0um)
GC-1.554424.0001	CD-5MS capillary column (60m x 0.25mm x 0.25um)
GC-1.554425.0001	CD-5MS capillary column (60m x 0.25mm x 1.0um)
GC-1.554426.0001	CD-5MS capillary column (100m x 0.25mm x 0.25um)
GC-1.554427.0001	CD-5MS capillary column (15m x 0.32mm x 0.25um)
GC-1.554428.0001	CD-5MS capillary column (30m x 0.32mm x 0.25um)
GC-1.554429.0001	CD-5MS capillary column (30m x 0.32mm x 0.5um)

Model	Description
GC-1.554430.0001	CD-5MS capillary column (30m x 0.32mm x 1.0um)
GC-1.554431.0001	CD-5MS capillary column (30m x 0.32mm x 3.0um)
GC-1.554432.0001	CD-5MS capillary column (30m x 0.32mm x 5.0um)
GC-1.554433.0001	CD-5MS capillary column (60m x 0.32mm x 0.25um)
GC-1.554434.0001	CD-5MS capillary column (60m x 0.32mm x 0.5um)
GC-1.554435.0001	CD-5MS capillary column (60m x 0.32mm x 1.0um)
GC-1.554436.0001	CD-5MS capillary column (60m x 0.32mm x 3.0um)
GC-1.554437.0001	CD-5MS capillary column (60m x 0.32mm x 5.0um)
GC-1.554438.0001	CD-5MS capillary column (15m x 0.53mm x 0.5um)
GC-1.554439.0001	CD-5MS capillary column (15m x 0.53mm x 1.0um)
GC-1.554440.0001	CD-5MS capillary column (15m x 0.53mm x 1.5um)
GC-1.554441.0001	CD-5MS capillary column (15m x 0.53mm x 3.0um)
GC-1.554442.0001	CD-5MS capillary column (30m x 0.53mm x 0.5um)
GC-1.554443.0001	CD-5MS capillary column (30m x 0.53mm x 1.0um)
GC-1.554444.0001	CD-5MS capillary column (30m x 0.53mm x 1.5um)
GC-1.554445.0001	CD-5MS capillary column (30m x 0.53mm x 3.0um)
GC-1.554446.0001	CD-5MS capillary column (30m x 0.53mm x 5.0um)
GC-1.554447.0001	CD-5MS capillary column (50m x 0.53mm x 0.5um)
GC-1.554448.0001	CD-5MS capillary column (50m x 0.53mm x 2.65um)
GC-1.554449.0001	CD-5MS capillary column (50m x 0.53mm x 5.0um)
GC-1.554450.0001	CD-5MS capillary column (60m x 0.53mm x 0.5um)
GC-1.554451.0001	CD-5MS capillary column (60m x 0.53mm x 1.0um)
GC-1.554452.0001	CD-5MS capillary column (60m x 0.53mm x 1.5um)
GC-1.554453.0001	CD-5MS capillary column (60m x 0.53mm x 3.0um)
GC-1.554454.0001	CD-5MS capillary column (60m x 0.53mm x 5.0um)
GC-1.608025.0001	CD-608 capillary column (30m x 0.25mm x 0.25um)
GC-1.608026.0001	CD-608 capillary column (30m x 0.32mm x 0.5um)
GC-1.608027.0001	CD-608 capillary column (30m x 0.53mm x 1.0um)
GC-1.624514.0001	CD-624 capillary column (30m x 0.25mm x 1.4um)
GC-1.624515.0001	CD-624 capillary column (60m x 0.25mm x 1.4um)
GC-1.624516.0001	CD-624 capillary column (30m x 0.32mm x 1.8um)
GC-1.624517.0001	CD-624 capillary column (30m x 0.32mm x 2.55um)
GC-1.624518.0001	CD-624 capillary column (60m x 0.32mm x 1.8um)
GC-1.624519.0001	CD-624 capillary column (60m x 0.32mm x 2.55um)
GC-1.624520.0001	CD-624 capillary column (30m x 0.53mm x 3.0um)
GC-1.624521.0001	CD-624 capillary column (60m x 0.53mm x 3.0um)



Model	Discription
HPLC-8.460571.0001	Athena C18, 4.6 × 50mm, 5µm
HPLC-8.461071.0001	Athena C18, 4.6 × 100mm, 5µm
HPLC-8.461571.0001	Athena C18, 4.6 × 150mm, 5µm
HPLC-8.462071.0001	Athena C18, 4.6 × 200mm, 5µm
HPLC-8.462571.0001	Athena C18, 4.6 × 250mm, 5µm
HPLC-8.210571.0001	Athena C18, 2.1 × 50mm, 5µm
HPLC-8.211071.0001	Athena C18, 2.1 × 100mm, 5µm
HPLC-8.211571.0001	Athena C18, 2.1 × 150mm, 5µm
HPLC-8.212071.0001	Athena C18, 2.1 × 200mm, 5µm
HPLC-8.212571.0001	Athena C18, 2.1 × 250mm, 5µm
HPLC-8.461574.0001	Athena C18, 4.6 × 150mm, 10µm
HPLC-8.462574.0001	Athena C18, 4.6 × 250mm, 10µm
HPLC-8.460572.0001	Athena C18-WP, 4.6 × 50mm, 5µm
HPLC-8.461072.0001	Athena C18-WP, 4.6 × 100mm, 5µm
HPLC-8.461572.0001	Athena C18-WP, 4.6 × 150mm, 5µm
HPLC-8.462072.0001	Athena C18-WP, 4.6 × 200mm, 5µm
HPLC-8.462572.0001	Athena C18-WP, 4.6 × 250mm, 5µm
HPLC-8.210572.0001	Athena C18-WP, 2.1 × 50mm, 5µm
HPLC-8.211072.0001	Athena C18-WP, 2.1 × 100mm, 5µm
HPLC-8.211572.0001	Athena C18-WP, 2.1 × 150mm, 5µm
HPLC-8.212072.0001	Athena C18-WP, 2.1 × 200mm, 5µm
HPLC-8.212572.0001	Athena C18-WP, 2.1 × 250mm, 5µm
HPLC-8.460573.0001	Athena C18-WP, 4.6 × 50mm, 3µm
HPLC-8.461073.0001	Athena C18-WP, 4.6 × 100mm, 3µm
HPLC-8.461573.0001	Athena C18-WP, 4.6 × 150mm, 3µm
HPLC-8.462073.0001	Athena C18-WP, 4.6 × 200mm, 3µm
HPLC-8.210573.0001	Athena C18-WP, 2.1 × 50mm, 3µm
HPLC-8.211073.0001	Athena C18-WP, 2.1 × 100mm, 3µm
HPLC-8.211573.0001	Athena C18-WP, 2.1 × 150mm, 3µm
HPLC-8.212073.0001	Athena C18-WP, 2.1 × 200mm, 3µm
HPLC-8.212573.0001	Athena C18-WP, 2.1 × 250mm, 3µm
HPLC-8.460575.0001	Athena C8, 4.6 × 50mm, 5µm
HPLC-8.461075.0001	Athena C8, 4.6 × 100mm, 5µm
HPLC-8.461575.0001	Athena C8, 4.6 × 150mm, 5µm
HPLC-8.462075.0001	Athena C8, 4.6 × 200mm, 5µm
HPLC-8.462575.0001	Athena C8, 4.6 × 250mm, 5µm
HPLC-8.210575.0001	Athena C8, 2.1 × 50mm, 5µm

Model	Discription
HPLC-8.211075.0001	Athena C8, 2.1 × 100mm, 5µm
HPLC-8.211575.0001	Athena C8, 2.1 × 150mm, 5µm
HPLC-8.212075.0001	Athena C8, 2.1 × 200mm, 5µm
HPLC-8.212575.0001	Athena C8, 2.1 × 250mm, 5µm
HPLC-8.460576.0001	Athena Silica, 4.6 × 50mm, 5µm
HPLC-8.461076.0001	Athena Silica, 4.6 × 100mm, 5µm
HPLC-8.461576.0001	Athena Silica, 4.6 × 150mm, 5µm
HPLC-8.462076.0001	Athena Silica, 4.6 × 200mm, 5µm
HPLC-8.462576.0001	Athena Silica, 4.6 × 250mm, 5µm
HPLC-8.210576.0001	Athena Silica, 2.1 × 50mm, 5µm
HPLC-8.211076.0001	Athena Silica, 2.1 × 100mm, 5µm
HPLC-8.211576.0001	Athena Silica, 2.1 × 150mm, 5µm
HPLC-8.212076.0001	Athena Silica, 2.1 × 200mm, 5µm
HPLC-8.212576.0001	Athena Silica, 2.1 × 250mm, 5µm
HPLC-8.460577.0001	Athena NH <sub>2</sub> , 4.6 × 50mm, 5µm
HPLC-8.461077.0001	Athena NH <sub>2</sub> , 4.6 × 100mm, 5µm
HPLC-8.461577.0001	Athena NH <sub>2</sub> , 4.6 × 150mm, 5µm
HPLC-8.462077.0001	Athena NH <sub>2</sub> , 4.6 × 200mm, 5µm
HPLC-8.462577.0001	Athena NH <sub>2</sub> , 4.6 × 250mm, 5µm
HPLC-8.210577.0001	Athena NH <sub>2</sub> , 2.1 × 50mm, 5µm
HPLC-8.211077.0001	Athena NH <sub>2</sub> , 2.1 × 100mm, 5µm
HPLC-8.211577.0001	Athena NH <sub>2</sub> , 2.1 × 150mm, 5µm
HPLC-8.212077.0001	Athena NH <sub>2</sub> , 2.1 × 200mm, 5µm
HPLC-8.212577.0001	Athena NH <sub>2</sub> , 2.1 × 250mm, 5µm
HPLC-8.460578.0001	Athena C18-BIO, 4.6 × 50mm, 5µm
HPLC-8.461078.0001	Athena C18-BIO, 4.6 × 100mm, 5µm
HPLC-8.461578.0001	Athena C18-BIO, 4.6 × 150mm, 5µm
HPLC-8.462078.0001	Athena C18-BIO, 4.6 × 200mm, 5µm
HPLC-8.462578.0001	Athena C18-BIO, 4.6 × 250mm, 5µm
HPLC-8.210578.0001	Athena C18-BIO, 2.1 × 50mm, 5µm
HPLC-8.211078.0001	Athena C18-BIO, 2.1 × 100mm, 5µm
HPLC-8.211578.0001	Athena C18-BIO, 2.1 × 150mm, 5µm
HPLC-8.212078.0001	Athena C18-BIO, 2.1 × 200mm, 5µm
HPLC-8.212578.0001	Athena C18-BIO, 2.1 × 250mm, 5µm
HPLC-8.460579.0001	Athena C4, 4.6 × 50mm, 5µm
HPLC-8.461079.0001	Athena C4, 4.6 × 100mm, 5µm
HPLC-8.461579.0001	Athena C4, 4.6 × 150mm, 5µm
HPLC-8.462079.0001	Athena C4, 4.6 × 200mm, 5µm
HPLC-8.462579.0001	Athena C4, 4.6 × 250mm, 5µm
HPLC-8.210579.0001	Athena C4, 2.1 × 50mm, 5µm
HPLC-8.211079.0001	Athena C4, 2.1 × 100mm, 5µm
HPLC-8.211579.0001	Athena C4, 2.1 × 150mm, 5µm
HPLC-8.212079.0001	Athena C4, 2.1 × 200mm, 5µm
HPLC-8.212579.0001	Athena C4, 2.1 × 250mm, 5µm



MDS-6600

## MDS-6600/8600 Microwave Digestion System

### Advantages of microwave sample preparation:

- The activation characteristic of microwave enables easier sample dissolution and chemical reaction. Combined with sealed container to increase pressure and temperature, it greatly increases the speed of chemical reaction and shortens the sample preparation time to 1/10 of traditional method.
- Volatile elements or components will not be lost in the process of sample preparation. Low reagent consumption, reducing blank value and waste liquid pollution to the environment.
- Lessening harm of acid mist to human bodies.
- Eliminating contamination of environment to the sample.
- Less interference factors, easier sample control and automation.

### Instrument features: (MDS-6600/8600)

- Large screen LCD displays pressure curve and parameters in real time, enabling clear understanding of the reaction status. Reaction results stored with chemical reaction characters, & can be recalled at any time.
- 10 sets of pre-stored digestion method satisfy routine sample digestion needs. Each set of method includes 5-step program (microwave power, total time, pressure value and pressure keeping time) to control the reaction, keeping uniform conditions for different batches of sample.
- The pressure control vessel and other sample vessels are under the same conditions, realizing true real time monitoring & over-pressure protection. Setting target pressure of each step at an increment of 0.1 for more accurate control. 10 double-cup vessels can be used at the same time for high efficiency of sample preparation.
- One second time-base design realizes fast and smooth microwave sample preparation.
- The cavity wall is coated with corrosion-resistant material, preventing acid & alkali corrosion. The system is designed with microwave leakage prevention.
- New-type rotating microwave provides even heating and easy control.
- Specially designed exhaust fan can get rid of acid mist easily.
- Adopting the newest technology of ideal gas pressure control system, real time pressure monitoring device and over-pressure protection, realizes easy and safe operation.

### Applications:

- Sample preparation for AAS, ECD, ICP-AES and MIP-AES according to EPA3015, EPA3050, EPA3052, EPA3015A standards
- Sample preparation for GC/LC/ICP-MS, GC/LC, UV-VIS & other chemical analysis. It's the best equipment for sample extraction according to EPA3546, ASTM D5258, D5765 and D6010.
- Chemical synthesis of molecular sieve catalyst, etc.
- Widely used in the field of Food, biology/botany, environmental protection, metallurgy, agriculture, geology, technical supervision, archaeology, aerospace materials, cosmetics, clinical examination, disease control, commodity inspection, research and teaching in universities and institutes.

### Instrument Features: (MDS-8600)

- The first microwave instrument with monitoring and alarm system for organic volatile reagent. When the concentration of organic gas reaches the alarm line, the alarm sounds and the system stops running.
- Adopting advanced optic fiber temperature measurement technique for more safety.
- New-type rotating microwave provides even heating and easy control.
- Specially designed exhaust fan can get rid of acid mist easily.

Model	MDS-6600	MDS-8600
Max. pressure / temp. display	5MPa / 300°C	5MPa / 300°C
Controllable pressure / temp.	4.0MPa / 300°C	5.0MPa / 230°C
Pressure setting / control accuracy	0.01MPa increment / ±0.05MPa	
Temp. setting / display accuracy	1°C / 0.1°C	
Microwave power setting / leakage	1% increment in the range of 1 — 100% / Less than 5mw/cm2	
Max. operating temp. / pressure	300°C / 4.0M Pa.	300°C / 5.0M Pa.
Vessel volume / amount	80ml / 4 sets of double-cup vessels are supplied as standard; Max. of 8 vessels can be placed in the sample bracket.	
Radiation	Interlock switch stops microwave radiation when the door opens.	
Microwave frequency / Power	2450MHz; 800W	2450MHz; 1000W
Power	AC220V, 15A, 50/60Hz, 1400W	AC220V, 15A, 50/60Hz, 1250W
Net weight	35.5kg; Cavity volume: 30L	35.5kg; Cavity volume: 30L
Dimensions	63 x 44 x 50cm.	63 x 44 x 50cm.



GG-NH-300/500

**GG-NH-300/GG-NH-500, Automatic High-purity Nitrogen Hydrogen Air Generators**

- Nitrogen purity: Oxygen amount less 3PPM, dew point: -56°C
- Nitrogen Flow: 0 – 300ml/min / 0 – 500ml/min
- Nitrogen Pressure: 0.4MPa
- Hydrogen purity: 99.999%
- Hydrogen Flow: 0 – 300ml/min / 0 – 500ml/min
- Hydrogen Pressure: 0.4MPa
- Air Flow: 0 – 2000ml/min
- Air Pressure: 0.4MPa
- Consumed Power: 330W
- Dimension: 350×350×500mm
- Net Weight: 30Kg



GG-N-H-300/500

**GG-N-H-300/GG-N-H-500, Automatic High-purity Nitrogen Air Generators**

- Nitrogen purity: Oxygen amount less 3PPM, dew point: -56°C
- Nitrogen Flow: 0 – 300ml/min / 0 – 500ml/min
- Nitrogen Pressure: 0.4MPa
- Air Flow: 0 – 2000ml/min
- Air Pressure: 0.4MPa
- Consumed Power: 275W
- Dimension: 470×260×380mm
- Net Weight: 30Kg



GG-N-S-300/500

**GG-N-S-300/GG-N-S-500, Nitrogen Generators**

- Nitrogen purity: Oxygen amount less 3PPM, dew point: -56°C
- Nitrogen Flow: 0 – 300ml/min / 0 – 500ml/min
- Working Pressure: 0.4MPa
- Consumed Power: 60W / 100W
- Dimension: 370×180×330mm
- Net Weight: 10Kg / 20Kg



GG-N-S-1000

**GG-N-S-1000, Nitrogen Generator**

- Nitrogen purity: Oxygen amount less 3PPM, dew point: -56°C
- Nitrogen Flow: 0 – 1000ml/min
- Working Pressure: 0.4MPa
- Consumed Power: 400W
- Dimension: 460×360×350mm
- Net Weight: 30Kg



**GG-H-S-1000**

### GG-H-S-1000, Hydrogen Generator

- Hydrogen purity: 99.999%
- Hydrogen Flow: 0 – 1000ml/min
- Working Pressure: 0.4MPa
- Consumed Power: 400W
- Dimension: 460×360×350mm
- Net Weight: 20Kg



**GG-H-S-300**

### GG-H-S-300, Hydrogen Generator

- Hydrogen purity: 99.999%
- Hydrogen Flow: 0 – 300ml/min
- Working Pressure: 0.4MPa, 0.6MPa optional / 0.3MPa
- Consumed Power: 150W / 100W
- Dimension: 370×180×330mm/200×140×290mm
- Net Weight: 10Kg / 6Kg



**GG-H-S-500**

### GG-H-S-500, Hydrogen Generator

- Hydrogen purity: 99.999%
- Hydrogen Flow: 0 – 500ml/min
- Working Pressure: 0.4MPa, 0.6MPa optional
- Consumed Power: 250W
- Dimension: 370×180×330mm
- Net Weight: 10Kg



**GG-A-S-2000 / 5000**

### GG-A-S-2000 / GG-A-S-5000, Automatic Air Generator

- Air Flow: 0 – 2000ml/min / 0 – 5000ml/min
- Working Pressure: 0.4MPa
- Pressure Stability: <0.003MPa
- Consumed Power: 175W / 275W
- Dimension: 420×250×350mm
- Net Weight: 20Kg



**MOIST-41, Moisture Tester**



**Wide application scope, high test capacity**

Applicable to all varieties and types of coke and coal. It can test 18 samples for moisture content on air dried basis or 9 samples for total moisture each time and is capable of testing several batches of samples continuously.

**Satisfying umpire analysis**

With the provision for passing a current of dry nitrogen through it & adopting light-wave heating, which features high heating rate and even heat distribution, the equipment satisfy umpire analysis.

**High automation**

Automatic weighing function could display real-time sample weight & calculate test results automatically.

**Easy to handle**

With CAN bus, several moisture testers can be controlled by a single PC balance could be connected and data could be transmitted by real-time network transmission.

**Application:**

Moisture Tester can be used to determine moisture content on air dried basis and total moisture in coal, coke, petroleum, minerals and so on.

**Conformance with Standards:**

ISO117722 Solid mineral fuels Hard coal Determination of moisture in the general analysis test sample by drying in nitrogen ASTM D5142-09 Standard Test Method for Proximate Analysis of the Analysis Sample of Coal and Coke by Instrumental Procedures GB/T212-2008 Standard Test Method for Proximate Analysis of coal GB/T211-2007 Determination of total moisture in coal.

Model	MOIST-41
<b>Max Sample</b>	18 samples (Inherent moisture) 9 samples (total moisture)
<b>Sample Weight</b>	(0.9-1.1)g for moisture content on air dried basis; (10-12)g for total moisture
<b>Furnace Temperature</b>	105°C ± 110°C
<b>Temp. Control Precision</b>	±3°C
<b>Analysis Time</b>	(20-40)min
<b>Power Requirement</b>	220V(-15%-10%), 50Hz
<b>Max Power</b>	1.5kw
<b>Size / Net weight</b>	542x506x564mm / 53kg
<b>Standard Layout</b>	Moisture Tester / Lenovo PC (Desktop) / Printer

**ASH-10, Ash Fusion Tester**



**High automation**

Automatically loading the cone support at ambient temperature. Automatically identifying four characteristic temperatures.

**More sample loading**

Up to 9 samples can be loaded once.

**Real-time monitor test process**

Equipped with CCD camera technology, the whole test process will be monitored in real time, the images will be shown on the computer screen & stored.

**Accurate test result**

HD color camera makes the images clearer, thus the identification of characteristic temperature can be more accurate.

**Recheck the test result available**

On completion of the test, the stored image can be replayed for finding the characteristic temperature manually.

**Precisely controlled furnace temperature**

**Low gas consumption**

**Easy to operate and handle**

- Easy to use Windows based software.
- Easy data handling, real time data can be transmitted through internal network.
- With CAN bus interface, several ash fusion testers can be controlled by a single PC.

**Application:**

Can be used to determine the four characteristic temperatures (DT, ST, HT & FT) of coal and coke ash.

**Conformance with Standards:**

ASTM D1857-04 Standard Test Method for Fusibility of Coal and Coke Ash. ISO540 (2004)Hrd coal and coke Determination of ash fusibility. GB/T2192008 Standard Test Method for Fusibility of Coal.



Model	ASH-10
<b>Samples Number</b>	5 (9 samples available according to customers requires)
<b>Max. Temperature</b>	1600°C
<b>Temp. Resolution</b>	1°C
<b>Furnace Material</b>	Mullite
<b>Heating Element</b>	Silicon, Molybdenum rods
<b>Heating Rate (User-defined available)</b>	20±5°C/min(≤900°C) 5±1°C/min(>900°C)
<b>Test Atmosphere</b>	Reducing atmosphere: Gas flow method; Oxidizing atmosphere: Air flow method
<b>Power Requirement</b>	220V (-15%-10%), 50Hz
<b>Max Power</b>	2.4kw
<b>Size / Net weight</b>	550x850x843mm / 100kg
<b>Standard Layout</b>	Ash Fusion Tester / Lenovo PC (Desktop) / Printer

## ELAn-12, Infrared Sulfur Analyzer



### Highlights:

#### High automation, safe operation

Up to 12 samples can be loaded and after that, the operator can be freed for other tasks. The analyzer will finish the whole test process automatically, including automatic sample introducing, testing and sample discarding, the operator needs not to operate under high temperature.

#### Adding and replacing samples during active analysis available

Unique auto-sample loading device makes sample adding and replacing available when active analysis is conducting.

#### Ultra-low drift infrared cell

With high-performance infrared light supply and superior optical glass as well as pure gold infrared path, the drift of the infrared cell,

#### Convenient to replace filter wool

To take filter boat out by sample introducing rod automatically, thus makes the replacement of the filter wool more convenient.

#### Extended working life of sample sending rod

Sample introducing rod with self-protection system, after presenting the samples, the rod will retreat to the low temperature zone automatically, so the working life of the rod is greatly extended.

#### Less gas consumption

With gas supplied by sample introducing rod which is hollowly designed, the software could decide whether to supply gas or not according to the position of the sample introducing rod, so the oxygen consumption is lowered and operation cost is reduced.



Hollow sample introducing rod

9 Patents, Infrared Sulfur Analyzer is the only type of sulfur analyzer which can replace the filter wool conveniently

### Application:

infrared Sulfur Analyzer can be used to determine the total sulfur content in coal, coke and other combustibles.

### Conformance with Standards:

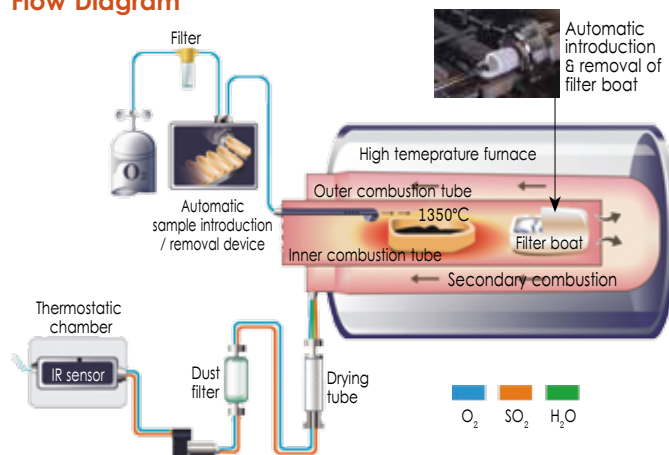
ISO 19579:2006 Solid mineral fuels Determination of sulfur by IA spectrometry

ASTM D4239-10 Standard Test Method for Sulfur in the Analysis Sample of Coal and Coke Using High Temperature Tube Furnace Combustion Methods

### Easy to operate and handle

- Easy-to-use Windows-based software.
- Easy data handling, real time data can be transmitted by internal network.
- With CAN bus interface, several sulfur analyzers can be controlled by a single PC.
- Connect with balance and network by standard interface RS232.

### Flow Diagram



Model	ELAn-12
Method	Infrared absorption
Test Range	0,01%~50% (Can be extended to 100% according to customers requires)
Sample Weight	200~500 mg
Recommended Weight	300 ± 50 mg
Analysis Time per Sample	≤ 110s
Max Sample	12
Furnace Working Temp.	1350°C
Power Requirement	220V(-15%~10%), 50Hz
Gas Requirement	Oxygen purity 99.5%
Max Power	4kW
Standard Layout	Analyzer, Lenovo PC (Desktop), Printer
Size	822x604x636mm
Net weight	108kg

**ELAn-18, Proximate Analyzer**



**Dual furnaces design**

Low temperature furnace for moisture test, high temperature furnace for ash and volatile matter test.

**High test efficiency, continuous test available**

Unique test mode of conducting moisture and ash test simultaneously, it can perform moisture and ash analysis in different furnaces, batch analysis of all the test indexes doesn't need to wait for furnace cooling to avoid time wasting. During the active analysis, operators can pre-weigh the next batches of samples.

**Improved accuracy**

Sample weighing at room temperature by external and internal balances, the influence caused by balance drift has been effectively reduced.

**Safe operation**

Specially designed volatile matter crucible together with unique auto-sample loading device to avoid the operation of replacement or removal crucible covers under high temperature thus to avoid the heat emission and hurt to the operator.

**Operation cost saving**

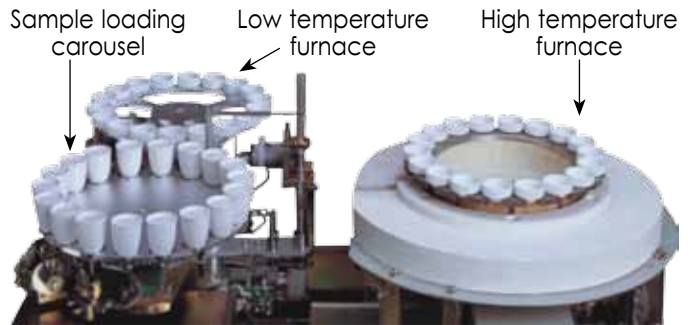
Gas supply by compressed air, no oxygen and nitrogen required.

**Easy to operate and handle**

- Easy-to-use Windows-based software, after finishing the sample weighing, operator's attendance is not needed.
- Easy data handling, real time data can be transmitted by internal network.
- With CAN bus interface, several proximate analyzers can be controlled by a single PC.
- Connect with balance and network by standard interface RS232.

15 Patents, including 7 invention patents, proximate analyzer is suitable for batches with large quantity of samples.

**Dual furnace design, test moisture and ash simultaneously**



Crucible clamping device



Weighing at ambient temperature

Model	ELAn-18
Sample Weight	0.5~1.1 mg
Furnace Temperature	Room temperature ~ 1000°C
Temp. Control Precision	±3°C (Moisture) ±5°C (Ash, Volatile matter)
Max Sample	18
Power Requirement	220V(-15%~10%), 50Hz
Gas Requirement	Compressed Air
Max Power	4.5kW
Standard Layout	Proximate Analyzer, Lenovo PC (Desktop), Printer
Size	878x613x601mm
Net weight	149kg

# COAL ANALYZERS Carbon, Hydrogen, Nitrogen

## ELAn-35, Carbon Hydrogen & Nitrogen Analyzer



### No disassemble or cooling required, easy to replace the combustion crucible.

For the elemental analyzers, the combustion residues will remain in the combustion crucible, after some quantity of tests (about 100), it needs to be replaced. For other brands, it is complex and time wasting, operators need to wait for the furnace cooling down and disassemble the analyzer, then replace the crucible manually. For us operators only need to click on the software, the crucible to be replaced will be presented from the combustion furnace to the crucible replacing door automatically. Once the crucible is replaced, tests can be conducted immediately.

### Convenient to replace the reagent furnace

Separate design of combustion furnace and reagent furnace makes the replacement of the reagent easy and convenient.

### Ultra-low drift infrared cell and thermal conductivity cell

With high-performance infrared light supply and superior optical glass, precise thermostatic control as well as pure gold infrared path, the drift of the infrared cell and TC cell have been optimized which are developed and designed by US.

### Low operation cost

Purity of 99.15% oxygen and nitrogen can meet the test requirement.

During the test, He consumption is only 0.7L/min.

### High automation

Up to 34 samples can be loaded and after that, operators can be freed for other tasks. The analyzer will finish the whole test automatically.

### Improved test precision

Samples are carried into the combustion furnace by oxygen blow, which can make sure all the gases obtained by combustion are collected into the gas chamber to improve the test precision.

### Shorten preheating time

Preheating time is less than 2.5 hours.

### Easy to handle

- Easy-to-use Windows-based software.
- Easy data handling, real time data can be transmitted through internal network.
- With CAN bus interface, several elemental analyzers can be controlled by a single PC.
- Connect with balance and network by standard interface RS232.

10 patents (7 Invention patents), the only type of elemental analyzer which can replace the combustion crucible automatically

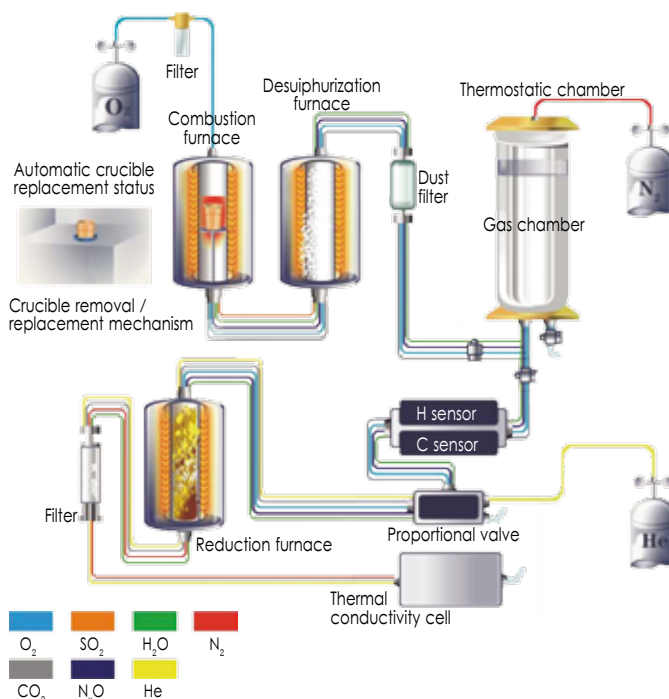
### Application:

Carbon Hydrogen & Nitrogen Analyzer can be used to determine the carbon, hydrogen and nitrogen content in coal, coke and other combustibles.

### Conformance with Standards:

15029541 Solid mineral fuels Determination of total carbon, hydrogen and nitrogen content Instrumental method  
 ASTM D5373-02 Standard Test Method for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Laboratory Samples of Coal and Coke  
 61311-476-2008 Standard Test method for Determination of Carbon and Hydrogen of Coal

### Flow Diagram



Model	ELAn-35
Method	Carbon & Hydrogen: infrared absorption Nitrogen: Thermal conduction
Measuring Range	Carbon (0.02%~100%) Hydrogen (0.02%~50%) Nitrogen (0.01%~50%)
Max Sample	34
Single Sample Analysis Time	≤ 5 min
Sample Weight	75-105mg (90mg recommended)
Repeatability	Cad≤0.5% Had≤0.15% Nad≤0.08%
Gas Requirement	Combustion Supporting Gas: Oxygen Purity: ≥ 99.5% Driving Gas: Nitrogen Purity: ≥ 99.5% Carrier Gas: Helium Purity: ≥ 99.99%
Power Requirement	220V(-15%~10%), 50Hz
Max Power	4.5kW
Standard Layout	Analyzer, Lenovo PC (Desktop), Printer
Size / Net weight	680x630x980mm / 127kg

**COMP-14, Oil Free Compressor**

**Applications:**

- Aeration • Pressure filtration.

**COMP-17, Air Supply System**

**Applications:**

- Fermentors • Bio reactor • Gas Chromatograph.



COMP-14

COMP-17

**Features:**

- **No pollution, maintenance free**  
COMP Series pumps are driven by Piston, no need for lubricant, regular oil changes and maintenance; with no oil pollution.
- **Quiet and low vibration**  
Driven direct by motor with no additional belt-driven transmission; the quality vibration-proof assembly makes COMP Series run at the lowest noise level among all other equivalent pumps.
- **Thermal protection device**  
Every motor of COMP Series pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then restart it when the temperature cools down.
- **Air outlet filter device**  
Every COMP Series pump is equipped with moisture trap in air outlet to filter particle, moisture and prolong the product life.



COMP-25

Model	COMP-14		COMP-17	
Voltage	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
Max. power (W)	90	85	147	125
Max. current (A)	0.9	0.4	1.5	0.6
Max. pressure (w/o moisture trap)	100 psi = 6.9 bar = 7 kg/cm <sup>2</sup>		100 psi = 6.9 bar = 7 kg/cm <sup>2</sup>	
Max. pressure (w moisture trap)	80 psi = 5.5 bar = 5.6 kg/cm <sup>2</sup>		80 psi = 5.5 bar = 5.6 kg/cm <sup>2</sup>	
Max. flow rate	14 l/min	12 l/min	27 l/min	25 l/min
Motor rotation	1700 RPM	1400 RPM	1700 RPM	1400 RPM
Horse power	1/8 HP		1/6 HP	
Pole	4P		4P	
Net/Gross Weight	4.1kg/5.1kg		5.2kg/6.2kg	
Port thread	8mm		8mm	
Noise level	50 dB		52 dB	

Model	COMP-25			
Voltage	110V/60Hz / 220V/50Hz			
Max. power (W)	147 / 125			
Max. current (A)	1.5 / 0.6			
Pressure	40 - 60psi			
Motor rotation	1700 RPM			
Max. pressure (w/o moisture trap)	27 l/min / 25 l/min			
Max. flow rate with air storage bucket	20psi	0-15 sec. 40 l/min	15-30 sec. Decreasing	after 30 sec. 27 l/min / after 30 sec. 25 l/min
	40psi	0-10 sec. 52 l/min / 0-10 sec. 50 l/min	10-25 sec. Decreasing	after 25 sec. 27 l/min / after 25 sec. 25 l/min
	60psi	0-8 sec. 65 l/min / 0-8 sec. 60 l/min	8-22 sec. Decreasing	after 22 sec. 27 l/min / after 22 sec. 25 l/min
Horse power	1/6 HP			
Pole	4P			
Net/Gross Weight	8.4kg/9.6kg			
Port thread	Quick coupling			
Noise level	50 dB			

## COMP-61, COMP-81, COMP-61X, COMP-81X, COMP-61XY, COMP-81XY, Silent Oil Free Air Compressors



### Features:

- **Super silent**  
Low working noise, create a quiet working environment.
- **Low vibration**  
With special rubber feet, reduce vibration during operation.
- **Pure air flow**  
Oil free design, no lubrication oil needed during operation.
- **Core technology**  
Diamond hardness cylinder ensure durable working performance.
- **Fashion and durable design**  
Compact structure, light weight. Under normal situation, can be used for more than 20000 hours
- **Use safety**  
With multiple self protection system, if here will be abnormal with pressure, current or voltage, the motor would cut off automatically to ensure equipment and personal safety.
- **Easy operation**  
Quite simple operation, connect to power supply, then no need any more maintenance, just drainage regularly.
- **Low energy consumption**  
Full automatic design, automatic stop and restart control, low consumption.
- **High precision filtration**  
With double filters, ensure high precision of outlet air flow.
- **Tank inside has done anti-rust treatment**  
Ensure pure outlet air flow for medical acquiresments.

Model	COMP-61	COMP-81	COMP-61X	COMP-81X	COMP-61XY	COMP-81XY
<b>Power</b>	600W	800W	600W	800W	600W	800W
<b>Volt./Hz</b>	110~240V 50~60Hz	110~240V 50~60Hz	110~240V 50~60Hz	110~240V 50~60Hz	110~240V 50~60Hz	110~240V 50~60Hz
<b>Speed</b>	1400/1750 r.p.m	1400/1750 r.p.m	1400/1750 r.p.m	1400 r.p.m	1400 r.p.m	1400 r.p.m
<b>Air Flow</b>	118L/min at 0Bar	155L/min at 0Bar	118L/min at 0Bar	155L/min at 0Bar	118L/min at 0Bar	155L/min at 0Bar
<b>Noise Level</b>	52dB	53dB	42dB	43dB	42dB	43dB
<b>Max. pressure</b>	8Bar	8Bar	8Bar	8Bar	8Bar	8Bar
<b>Restart Pressure</b>	5Bar	5Bar	5Bar	5Bar	5Bar	5Bar
<b>Tank Capacity</b>	24L	40L	24L	40L	24L	40L
<b>Weight</b>	24/32kg	28/36kg	50/60kg	50/65kg	60/86kg	66/89kg
<b>Product Size</b>	410x410x550mm	410x410x650mm	500x500x700mm	500x500x770mm	500x650x700mm	500x650x770mm



**RGB-1002, color analyzer, R, G, B, Hue, Saturation, Luminance**

• The RGB-1002 is a portable color meter equipped with an external sensor probe having a 45°/0° color measuring geometry. The modern, accurate microprocessor technology uses the spectral analysis method to determine the color of the sample. Excellent repeatability due to spectroscopic analysis technique used. Saturation value: 0 to 1.000. • Friendly operation, just press the operation button to get the color value (R, G, B or H, S, L). • Relative function, can easily compare the color value of the different two measurement materials • The RGB-1002 is designed mainly for measuring the color of no lighting sample such as textiles, paper, leathers, painting materials. It is a useful tool for the quality control and the wide industrial application. • The color analyzer also can measure the reference lighting sample color value such as CRT, LCD monitor, LED lamp, lighting lamp. • For no lighting sample color measurement, a defined light source illuminates the sample and the reflected surface light is spectrometrically analyzed. • For lighting sample color measurement, the light source of sample is spectrometrically analyzed directly. • RS232 computer interface, can store the measuring color value in the computer for recording and further color analysis. • Build in CAL (Calibration) button, for no lighting sample measurement, use the included white color calibration card to make the self calibration easily. • Hand held housing case, easy to carry out. • Power supply by 006P DC 9V battery or DC 9V adapter.

**Applications**

- To check the color value of textiles, paper, leathers, painting materials.
- The objective quality control of color during production.
- The color measurement and recording of products supplied by supplier to check for conformity specification.
- The comparison of color samples against color standard.
- The interpretation and statistic evaluation of color sample measurement.
- To check the reference color value of CRT monitor, LCD monitor, light lamp.

Model	RGB-1002
Display	LCD size : 59 mm x 34 mm.
Measuring geometry	45° /0° - circular illumination at 45°, measurement at 0°.
Spectral range	400 nm to 700 nm.
Light source	Two white LED lamp.
Measuring principle	For no lighting sample color measurement such as textiles, paper, leathers, painting materials, a defined light source illuminates the sample and the reflected surface light is spectrometrically analyzed. * For lighting sample color measurement, the light source of sample is spectrometrically analyzed directly.
Color sensors	3 color photo transistors: Red photo transistor Green photo transistor Blue photo transistor
Calibration	Self calibration. * The calibration white calibration card is included.
Measurement	RGB value R (Red) value: 0 to 1023, G (Green) value: 0 to 1023, B (Blue) value : 0 to 1023. HSL value Hue value: 0 to 1,000, Saturation value: 0 to 1.000, Luminance value: 0 to 1.000.
Repeatability	R (Red) value < 3, G (Green) value < 3, B (Blue) value < 3, Hue value < 0.01, Saturation value < 0.01, Luminance value < 0.01 * Repeatability is specified under the same sample tested 10 times within two minutes. * Accuracy is specified under after the instrument is calibrated.
Buttons	OP button (Operation button)
	CAL button (Calibration button)
	REL button (Relative button)
	RGB/HSL button (Select RGB or HSL value)
Power off	Light ON/OFF button * No lighting sample measurement, select the sensor light to on. * Lighting sample measurement, select the sensor light to off. Auto shut off saves battery life or manual off by push button. * Power will off automatically after 3 min., if no buttons be pressed.
Low battery	Low battery indicator.
Computer interface	RS 232 PC serial interface.
Operating Temp.	0°C to 50°C (32°F to 122°F)
Operating Humidity	Less than 80% R.H.
Power Supply	DC 9V battery, Alkaline type 006P, MN1604(PP3) or equivalent.
	DC 9V adapter input. @ AC/DC power adapter is optional.
Power Current	Standby : Approx. DC 6.3 mA. Measurement : Approx. DC 32 mA. (2 SEC.)
Weight	478 g/ 1.05 LB. * Main instrument and the sensor probe
Dimension	Main instrument: 203 x 76 x 38 mm, Sensor probe: 160x92x45 mm
Accessories Included	* Instruction manual: 1PC * Sensor probe (RGB-1002P): 1 PC * White color calibration card: 1 PC * Carrying case, CA-06: 1 PC
Optional Accessories	* AC to DC 9V adapter. * RS232 cable, UPCB-02. * USB cable, USB-01. * Data Acquisition software, SW-U801-WIN.



**CLRM-110, Precision Colorimeter**

**Advantages:**

- Built-in white plate parameters. There is no need to calibrate each time which realizes rapid measurement.
- Double Locating: Illuminating locating and precise cross locating.
- Switch able Double Measurement End face: Large area stable end face and small area measurement for concave-convex end face.
- New Integrating Sphere Optical Path Design: Eliminating the stray light of main optical path and auxiliary optical path. Having the advantages of the highest measurement stability and precision.
- 4mm Measuring Aperture: suitable for covering more measuring conditions.
- Equipped with rechargeable high-capacity Li-ion battery. No need to purchase battery repeatedly.
- Once Connect to a PC the CQCS3 will allow for extended functionality.
- The CLRM-110 passed SCM Metrological Certification, CE Certification, & ISO9001 Quality Management System Certification.
- Build in prob: small and convenient; make the measurement easier.
- Exquisite appearance: adopts traditional and fashionable esthetic designs.

**Applicable Industries**



Model	CLRM-110
Measurement End-face	Large stable end-face and small area concave-convex end face
Color Space	CIEL *a*b*C*h* CIEL *a*b
Color Difference Formula	$\Delta E^*ab \Delta L^*a^*b \Delta E^*C^*h^*$
Illuminating/Viewing Geometry	8/d
Detector	Silicon photoelectric diode
Measuring Aperture	Φ4mm
Locating	Illuminating Locating / Cross Locating
Light Source	D65
Light Source Device	LED blue light excitation
Lamp Life	5 years, more than 1.6 million
Dimension	205 x 67 x 80 mm
Storage	100pcs standards 20000pcs samples
Weight	450g
Errors Between Each Equipment	$\leq 0.50 \Delta E^*ab$
Repeatability	Standard deviation within $\Delta E^*ab$ 0.08 Average of 30 measurements of standard white plate
Power source	Rechargeable lithium-ion battery 3.7V@3200mAh
Charging Time	2 hours(8 hours for first charge)—100% electricity
PC Software	CQCS3 Software
Printer (optional)	Miniature thermal printer





CLRM-200

CLRM-300/310

for CLRM-310



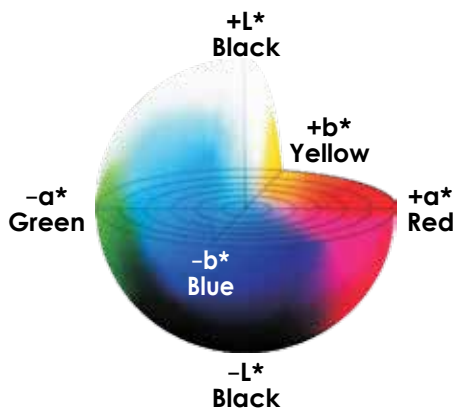
Universal Test Components



Powder Test Box

**ΔE Total Color Aberration**

large ΔL stands for the partial White color.  
 small ΔL stands for the partial black color.  
 large Δa stands for the partial red color.  
 small Δa stands for the partial green color.  
 large Δb stands for the partial yellow color.  
 small Δb stands for the partial blue color.



**CLRM-200, CLRM-300, CLRM-310, High Quality Colorimeter**

**Advantages:**

**High Quality User Interface & Convenient Operation**

- One-Touch Access to the Measurement Interface. (CLRM-200/300)
- Auto White and Black calibration at Startup. (CLRM-310)
- Structure Design in line with Ergonomics.
- Easy-to-use User Interface.

**Stable Measurement Performance**

- The average fluctuation of ΔE for CLRM-200 is less than 0.08, for CLRM-300 is between 0.04~0.06 & for CLRM-310 between in 0.03~0.06.
- Portable structure design is more conducive to keeping the instrument stable when using.

**Flexible and Accurate Locating**

- Camera locating can solve the problem of locating a small area. The minimum width of locating is 4mm. (CLRM-310)
- Illumination locating is a fast, simple and convenient locating which is created by CLRM-200/300/310.

**More Measurement Modes (CLRM-310)**

- Three measuring apertures to cover more measuring conditions
- Five color spaces for more color scheme selections.
- Three light sources suitable to cover more measuring conditions

**PC Software-Realize More Function Expansion**

- CLRM-200/300/310 has the intellectual property of PC software. The corresponding software serial number and password protection are configured in the colorimeter.
- Be able to perform color difference analysis, color difference cumulative analysis, chromaticity index, color sample database management, simulating object color, etc.

**Advanced Power Management Design**

- CLRM-200/300/310 is the first to use using high capacity Li-ion battery in colorimeter.
- CLRM-200/300/310 Li-ion battery can be repeatedly charged to save costs. As well as measuring more than 3000 times on one charge to ensure the stability of long time measurement.

Model	CLRM-200	CLRM-300	CLRM-310
<b>Color Space</b>	CIEL *a*b*C*h* CIEL *a*b CIEXYZ		CIEL *a*b*C*h* CIEL *a*b CIEXYZ CIERGB CIEL *u*v* CIEL *C*h Yellowness & Whiteness Color Fastness
<b>Color Difference Formula</b>	ΔE*ab ΔL*a*b ΔE*C*h*		ΔE*ab ΔL*a*b ΔE*C*h* ΔECIE94 ΔHunter
<b>Illuminating/Viewing Geometry</b>	8/d		
<b>Detector</b>	Silicon photoelectric diode		
<b>Measuring Aperture</b>	Φ8mm		Φ4mm / Φ8mm
<b>Light Source</b>	D65		D65 D50 A
<b>Light Source Device</b>	LED blue light excitation		
<b>Lamp Life</b>	5 years, more than 1.6 million		
<b>Dimension</b>	205 x 70 x 100 mm		205 x 67 x 80 mm
<b>Storage</b>	100pcs standards 20000pcs samples		
<b>Weight</b>	500g		
<b>Errors Between Each Equipment</b>	≤0.50ΔE*ab	≤0.40ΔE*ab	≤0.40ΔE*ab
<b>Power source</b>	Rechargeable lithium-ion battery 3.7V@3200mAh		



CLRC-115

Lamps of Light Source

<b>D65</b>	Artificial daylight	6500°K
<b>A</b>	Standard filament light A	2300°-2800°K
<b>CWF</b>	Cool white florescent light	4000°K
<b>UV</b>	Ultraviolet light	360mm wave length

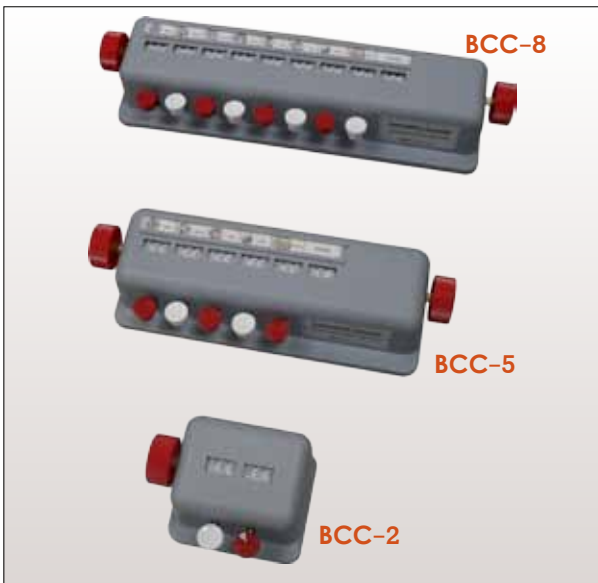
CLRC-115, Color Comparison Cabinet

CLRC-115 Color Comparison cabinet are designed in accordance with ASTM D1729, and lights standard of C.I.E. The cabinet are intended for use by industry work shops, manufacturers, processors and inspectors, in short, for anyone involved with color and color matching on products, incorrect formulation can be avoided.

**Application:** Paint, ink, pigment, cream manufacturer and processor's and painting's color matching • Plastic, rubber, textile and leather goods color matching • Cars / Vehicles and machineries finish color matching • Cosmetic, food, chemical, medicine and papers industries color assessment • Glass, porcelain, enamel, construction materials color assessment.

Technical Data

<b>Lamps</b>	D25x2, Ax2, CWFx2, UVx
<b>Outside DIM.(mm)</b>	L710xD460xH580
<b>Inside DIM.(mm)</b>	L680xD420xH405
<b>Housing</b>	Steel case with paint finishing
<b>Counter</b>	9999/H
<b>Power supply</b>	AC110/220V, 60/50Hz
<b>Weight</b>	Net weight 32Kg

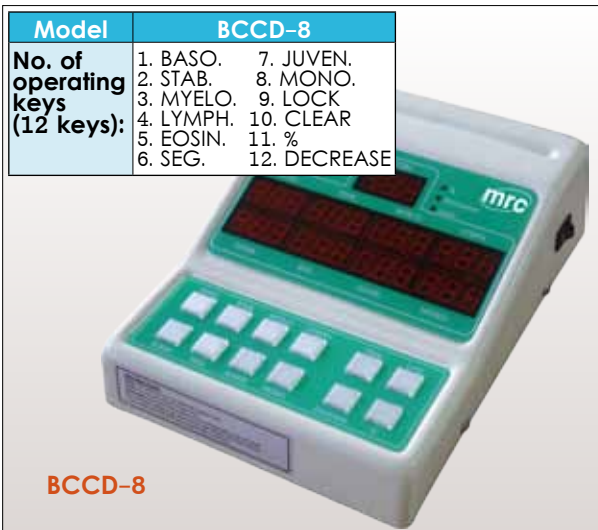


BCC-2/5/8, Differential Blood Cell Counter

Features:

- ABS outer shell can resist collision.
- Color charts of white blood cells are supplied. (BCC-5 including BASO, EOSIN, SEG, LYMPH, MONO.; BCC-8 including BASO, EOSIN, MYELO, JUVEN, STAB, SEG, LYMPH, MONO.).
- At one hundred increment of the total record, the bell rings (for BCC-5, BCC-8).
- Reset knob can easily clear all figures.

Model	BCC-2	BCC-5	BCC-8
<b>Total of keys</b>	2	5	8
<b>Total of windows</b>	2	6	9
<b>Totalizer</b>	No	Yes	Yes
<b>Figure range</b>	0~999	0~999	0~999
<b>Overall DIM. WxDxH (mm)</b>	100x80x50	250x80x50	320x80x50
<b>Weight (g)</b>	325g	690g	800g



BCCD-8, Digital Differential Blood Cell Counter

Ideal for accompaniment for quick differential count. This cell counter is featured with reliability, accuracy, stability and it is a sleek device. These cell counters are available with 12 operating keys that are suitable for clinical labs for showing the primary bacterial or virus infections. These are economical.

Features:

- 8 units lab-count with totalizer. For simplifying differential blood cell counts
- The 8 keys represent the normal Schilling Groups of Leucocytes. The above keys are carrying the name and picture of particular cell
- Each stroke registers both in the unit corresponding to its pressed key & in the window
- When a total of every 100 cells are counted, a bell rings. BCCD-8 features the percentage of each type of cell to be read from the window above each key. Manually count and display from 0 - 999
- Counter clockwise rotate handle to clear figures.

Model	BCCD-8	
<b>No. of operating keys (12 keys):</b>	1. BASO.	7. JUVEN.
	2. STAB.	8. MONO.
	3. MYELO.	9. LOCK
	4. LYMPH.	10. CLEAR
	5. EOSIN.	11. %
	6. SEG.	12. DECREASE



CLC-570

Colony counter 570 is designed with all solid state circuitry, & the pressure sensor system provides uniform sensitivity over the whole of working field; suitable for counting bacteria growing on all agar contained in different size of petri dishes. The model has adapted the latest electronic type ring-shaped lamp for its illuminating device. At a touch, the fluorescent tube lights up directly or indirectly over the entire petri plate surface for a steady, non-glare and quiet illumination; providing the operator the most comfortable working environment. The number of counts is capable of being registered to max. of 4-digits, i.e. 9999, & displayed on bright red LED. The adjustable focusing arm enables the magnifying glass to be placed at various angles of working position. The focusing arm can also accommodate lens of various magnitude. Intelligent counting technology enables the Model 570 to count with any kind of marking pen. Every time a count is registered, & the beeper gives an audible signal to verify entry.



CLC-230

#### Features:

CLC-230 is designed for counting bacterial colonies growing on nutrient agar in Petri-dishes with a wide range of dish diameter from 90 to 150mm and 0mm. Innovative PC software enables you to record, trace, or report sample No., data, user's name, row count, dilution factor, total count etc. Pressure sensor design makes the counter to be operated by any marking pen. Ring-shaped illumination lamp with electronic ballast results in glare-free light without blinding or noise and makes operator working comfortable without eyestrain. Unique "BACK" button allows you to deduct data when over counting. Contrast-plate with white and black side is supplied for using dark or clear agar.

#### CLC-570, Colony Counter With Electronic Register Features:

- Built-in electronic register on deluxe model-operated by any pen.
- Pressure sensor system provides uniform sensitivity over the whole working field.
- A reset button provides immediate zeroing of the 4-digit counter.
- Flexible adjuster accepts 10 cm to 15 cm petri dishes.
- Adjustable focusing arm allows 1.5x standard lens to be raised or lowered up to your preference.
- Lens can be rotated 360° for ready access to petri plates.
- Background plate can be changed to white or black for easy counting.

Model	CLC-570
<b>Working principle</b>	Pressure sensor system provides uniform sensitivity over the whole of the working field
<b>Readout</b>	4-Digit bright red, 0.6" LED display
<b>Petri dish holder</b>	Accept 10cm to 15cm dish using flexible adjuster
<b>Illumination</b>	Ring-shaped lamp provides direct or indirect illumination
<b>Zero reset button</b>	Yes
<b>Modes of counting</b>	Marking pen counting (any pen), switch pen counting
<b>Dimension(mm)</b>	W300 x D330 x H100
<b>Power</b>	115/230 VAC, 50/60Hz
<b>Net weight</b>	5 kgs
<b>Standard accessories</b>	1.5x auxiliary - 1pc, Adjustable focusing arm - 1pc, Marking pen - 1pc, Power cord - 1pc
<b>Optional accessories</b>	Switch pen 8-02-1

#### CLC-230, Colony Counter With RS-232 Communication & Software

##### Ordering Information :

- **175200-11(22)**  
CLC-230 Colony Counter, AC110V,60Hz (220V, 50Hz).
- **175300-11(22)**  
CLC-230 Colony Counter (Complete with PC software & RS232 interface connecting cable), AC110V, 60Hz (220V, 50Hz).
- **175300-12>**  
PC software and RS232 interface connecting cable.

**Applications:** • Total bacteria. • Total coliform.

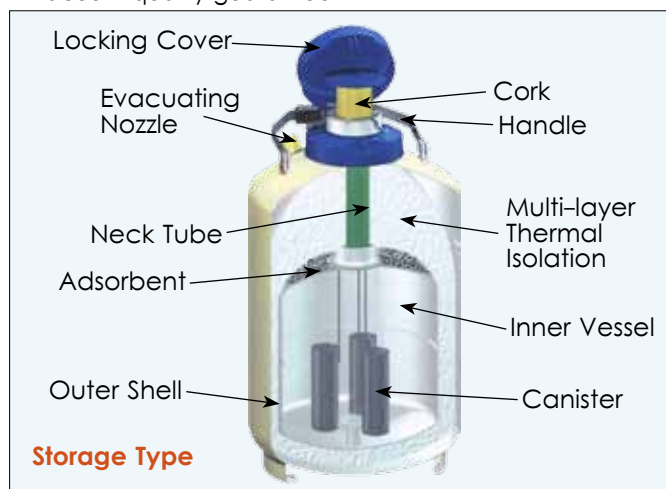
Model	CLC-230
<b>Display</b>	4-Digit (0-9999) bright red 0.6" LED display
<b>Magnification</b>	2~3x
<b>Petri dish size</b>	60mm and 90-150mm diameter, adjustable
<b>Zero reset</b>	YES
<b>Count back</b>	YES
<b>Illumination</b>	Glare-free ring-shaped lamp
<b>Pressure sensitivity</b>	Adjustable
<b>Counting signal</b>	Adjustable
<b>Output</b>	RS232
<b>Dimensions (mm)</b>	W313xH360xD346
<b>Weight</b>	Net: 5.2kg Shipping: 6.4kg



## CRY-Series, Liquid Nitrogen Biological Container for Storage(I)

### Features:

- High performance modern construction and advanced insulation materials assure high thermal efficiency.
- Easy operation lightweight snap-on cap and neck tube assures tight closure and easy access, convenient large handles.
- High-strength aluminum alloy structure, light weight when empty.
- Hinged handle, portable.
- Encoding canisters, for easy recognition and convenient accessing of samples.
- Protecting jacket, portable and preventing collision.
- Lockable cover (optional), protecting biological samples stored (except 30mm caliber).
- Multi-layer thermal isolation design, more than five-year vacuum quality guarantee.



### Applications:

- Available in 9 sizes, to fit the requirements & space limitations of research or clinical laboratories.
- Super vacuum insulation, durable construction provide years of trouble-free service.
- Secure locking hasp prevents unauthorized use.
- Uniform temp. environment for specimen storage.
- Every vessel includes six cans to accommodate ampules.



Model	Unit	CRY-1	CRY-2	CRY-3	CRY-6	CRY-10	CRY-20	CRY-35
Capacity	L	1.0	2.2	3.15	6.0	10.0	20.0	35.5
Empty weight	kg	2.0	2.9	3.4	5.0	6.2	11.2	15.1
Neck diameter	mm	30	30	50	50	50	50	125
Outer diameter	mm	180	217	224	287	303	409	473
Height	mm	320	365	425	445	530	655	690
Static evaporation loss mass	L/d	0.06	0.06	0.10	0.10	0.10	0.10	0.29
Static holding time	d	16	32	31	63	101	202	123
Canister outer dia.	mm	26	19	38	38	38	38	97
Canister height	mm	120	120	120	120	120	120/276	120/276
Numbers of canisters	n	1	3	6	6	6	6	6
Straw holding capacity (single level)	0.5ml	60	90	792	792	792	792	5124
	0.25ml	120	204	1788	1788	1788	1788	11952
Straw holding capacity (double level)	0.5ml	-	-	-	-	-	1284	9048
	0.25ml	-	-	-	-	-	2832	19944
Number of canes	n	-	-	-	-	-	24	198
Number of vials	n	-	-	-	-	-	120	990



**CRY-xxL Series**

**CRY-xxL Series, Liquid Nitrogen Container for Storage(I)**

This series is designed specifically for liquid nitrogen storage, and characterized by their small calibers and low static evaporation loss.

**Features:**

- High-strength aluminum alloy structure
- Multi-layer thermal isolation design
- Protective jacket to prevent collision.



**Optional: Level Monitor**

Model	Unit	CRY-10L	CRY-20L	CRY-30L	CRY-35L	CRY-50L
<b>Capacity</b>	L	10.0	20.0	31.5	35.5	50.0
<b>Empty weight</b>	kg	6.2	11.2	12.9	13.8	21.1
<b>Neck diameter</b>	mm	50	50	50	50	50
<b>Outer diameter</b>	mm	303	409	446	473	500
<b>Height</b>	mm	530	650	670	680	805
<b>Static evaporation loss mass</b>	L/d	0.10	0.10	0.10	0.11	0.20
<b>Static holding time</b>	d	101	202	295	333	252

**Options:**



**YDH-Series, Liquid Nitrogen Dry Shipper**

There is liquid nitrogen absorbent in the vessel of this Series. The absorbent absorbs & stores liquid nitrogen inside & even if the container is turned over during transportation, liquid nitrogen never spills out. With lower static evaporation loss, it makes them safe to use for air transportation.



**YDH-3**

**YDH-8-80**

Model	Unit	YDH-3	YDH-8-80
<b>Capacity</b>	L	3.5	8.0
<b>Empty weight</b>	kg	5.2	8.9
<b>Neck diameter</b>	mm	50	80
<b>Outer diameter</b>	mm	224	303
<b>Height</b>	mm	535	610
<b>Static evaporation loss mass</b>	L/d	0.14	0.22
<b>Static holding time</b>	d	25	36
<b>Canister outer dia.</b>	mm	38	70
<b>Canister height</b>	mm	276	276
<b>Numbers of canisters</b>	n	1	1
<b>Straw holding capacity</b>	0.5ml	214	820
	0.25ml	472	1780
<b>Number of canes</b>	n	4	15
<b>Number of vials</b>	n	20	75

Cooling and the freezing of biological products is a complex process during which many chemical and physiological changes can occur. Biological products can be preserved in many ways, but the storage at very low temperatures is the only method of conservation that minimizes these changes.

Living cells have a critical temperature of  $-130^{\circ}$ , beyond this threshold temperature the stability of the sample can't be guaranteed.

In order to guarantee stability of the sample living cells must be stored under temperatures provided by using liquid nitrogen ( $-196^{\circ}\text{C}$ ) and we then have a safety margin of  $+60^{\circ}\text{C}$  from the critical point.

### CRYC-Series, Liquid Nitrogen Container With Racks

The Series products are designed for storing biological samples in vials, especially suitable for the fields of medical treatment and biological science and research. They feature in storing large capacity of biological samples and low liquid nitrogen consumption, which are the most economical choice.



#### Main Features:

- Unique hanging rack and guided box design, allows for easy tracking and retrieval of samples.
- Advanced vacuum insulation minimizes liquid nitrogen evaporation and reduces operating costs.
- Durable aluminium construction provides years of trouble free service.
- Compact size allows system to easily fit into any lab.
- An optional sturdy 4 wheels cart provides easy movement within the laboratory.
- Super vacuum insulation offers unbeatable liquid nitrogen efficiency.
- Level measuring scale (optional), for measuring the current level of liquid nitrogen.
- Lockable cover (optional), prevent unauthorized entry.
- Plastic box, for storing in vials.
- Narrow neck design.

Model	Unit	CRYC-47	CRYC-65	CRYC-120	CRYC-175
Capacity	L	47.0	65.0	121.0	175.0
Empty Weight	kg	19.0	27.5	43.0	54.5
Neck diameter	mm	127	216	216	216
Outer diameter	mm	500	573	573	676
Height	mm	675	710	1000	1020
Static evaporation loss mass	L/d	0.33	0.79	0.87	0.87
Static holding time (days)	d	142	82	139	202
Numbers of racks	n	7	5	5	7
Box per rack	n	5	5	10	10
Measurement of rack	mm	82x84	142x144	142x144	142x144
Measurement of box	mm	76x76	134x134	134x134	134x134
Box needed for system	n	35	25	50	70
Number of vials	n	875	2025	4050	5670



**BDI-Series, DispensMate Plus Bottle-Top Dispenser**

**Features:**

- Excellent chemical resistance
- Fully autoclavable at 121°C
- Four ranges of bottle-top dispenser cover a volume range from 0.5ml to 50ml
- Easy to clean and maintain
- The optional flexible discharge tube with safety handle permits fast and precise dispensing
- Made of PTFE, FEP, BSG, PP
- Vapor pressure Max. 500 mbar, viscosity max. 500mm<sup>2</sup>/s, temperature max. 40°C, density max. 2.2g/cm<sup>3</sup>
- DispensMate plus is supplied with S40, GL32, GL38, GL25, GL28 sized adapters
- Bottle not included.

**DispensMate plus Bottle-top Dispenser Chemical Compatibility at 200°C:**

The devices of DispensMate plus which contact with dispensed liquid consist of BSG, PTEF, FEP, and closure cap of outlet is PP; non contact liquids parts consist of PC and other materials. Please note that these tables are just a directional guide not the manufacturer's

commitment. Please read the user manual carefully before use and to do related experiments necessarily, which can be used to determine whether should be used. Good laboratory practice would be to rinse out the liquid handing unit at the end of each day with distilled water to prevent corrosive liquids being left in contact with the parts for too long.



Model	Volume Range (ml)	Graduation (ml)	A <sub>±</sub>		CV <sub>≤</sub>	
			%	µl	%	µl
BDI-5-1	0.5-5	0.1	0.5	25	0.1	5
BDI-10-1	1.0-10	0.2	0.5	50	0.1	10
BDI-25-1	2.5-25	0.5	0.5	125	0.1	25
BDI-50-1	5.0-50	1.0	0.5	250	0.1	50

A = Accuracy; CV = Coefficient of variation.

**Accessories Included:**

Model	Descriptions
17000069	S40. Adapter. 45/40mm
17400017	GL32. Adapter. 45/32mm
17400018	GL38. Adapter. 45/38mm
17400019	GL25. Adapter. 32/25mm
17400020	GL28. Adapter. 32/28mm
17400037	Reagent Boule (Brown, IL)
17400021	Filling tube (m)
17400073	Discharge tube (rn)





### DA-130N, Portable Density/Specific Gravity Meter

#### Features:

- Sampling volume and speed is single hand controlled. (Patent pending)
- Operative either by right or left hand, the cell can be viewed during measurement.
- Light weight allows operators to feel tireless in the normal operations.
- Viscous liquid up to ca 2000 mPa\*s can be sampled in.
- The display shows density, temperature compensated density, specific gravity, temperature compensated specific gravity, Brix %, alcohol concentration, sulfuric acid concentration, API concentration, Baume degree, Plato and Proof degree and the like.
- Graphic LCD can display temperature (°C/°F), sample number, auto sensing oscillation stability, auto data saving, auto data output, data deletion, battery capacity indicator, and the like.
- Life of battery is increased four times more than conventional makes, providing much longer operation time.

#### Applications:

- Density measurement on crude oil, fuel oil, lubricants and the like.
- ISO 758 for chemical products requires measurement by oscillation method for 20°C density and 20/20°C specific gravity.
- Density or Brix of milk, soft drinks, fruit beverages & the like.
- Alcohol degree of beer, whisky, wine and spirits.
- Quality control by measuring Brix or concentration of food materials.
- Density or specific gravity of oils and fats such as vegetable oils or animal oils.
- Conforming to U.S. Pharmacopeia for pharmaceutical products.
- Concentration control of etchant or pickling fluid for electronic components.
- Concentration control on flux or plating fluid.

Model	DA-130N
Measuring method	Natural Oscillation type
Measurement object	Liquid sample test materials
Range	0.0000 ~ 2.0000 g/cm <sup>3</sup>
Precision	±0.001 g/cm <sup>3</sup>
Resolution	0.0001 g/cm <sup>3</sup>
Temperature range	0 ~ 40.0°C
Display contents	Density and Relative gravity (with/without temperature compensated) Brix%, Alcohol wt%, Alcohol vol%, Proof, Baume, Plato, API, %H <sub>2</sub> SO <sub>4</sub> , Conc. (set by User), Temperature, Sample number, Stability sense, Data storage, External output, Battery capacity
Temperature compensation	Up to 10 entries for temperature compensation coefficient & converted temperature
Automatic calibration	All density values of pure water needed for auto calibration can be stored.
Number of data	1,100 samples
External output	PC or Printer can be connected. (not both) <ul style="list-style-type: none"> <li>• IrDA interface is standard equipped.</li> <li>• Connection via RS-232C requires optional infrared RS converter (98-029-0007).</li> </ul>
Weight	Approximately 360g
Power source	DC 3V (2 pieces of 1.5V alkaline dry cell ("AAA"))
Battery life	Approximately 90 hours
Sampling method	Syringe-type hand pump





DA-100

**DA-100, Density/Specific Gravity Meter**

The DA-100 has built-in thermostat to enable stable temperature control, & density/specific gravity is measured quickly & precisely. Accuracy of measurement is  $\pm 0.001\text{g/cm}^3$  by measuring resonant frequency.

**Specifications:**

Model	DA-100
Measurement method	Natural Oscillation method
Measurement range	0~3g/cm <sup>3</sup>
Measurement accuracy	$\pm 0.001\text{g/cm}^3$
Measurement temperature range	15°C~40°C(0.1°C step) 59°F~104°F(1°F step)
Temperature accuracy	$\pm 0.5^\circ\text{C}$
Temperature control	$\pm 0.1^\circ\text{C}$
Measurement time	20sec~90sec (within 1min for aqueous solution)
Min. sample required	Approx.1mL (manual sampling by syringe)
Display	16 character X2 lines on LCD with back light Density, specific gravity: x.xxx Temperature: xx.x°C or xxx°F Concentration: $\pm x.xxx \sim \pm xxxxx$ (1 to 3 digits after decimal can be selected.) Messages
Sampling	Manual sampling by syringe (or optional sampling unit)
Stability judgment	By built-in processor
Calibration	2 point factor calibration using dry air & de-gassed pure water
External output	RS-232C (1 channel)
Outer dimension (WxDxH)	275x350x165mm
Power supply	AC100~115V or AC220~240V, 50/60Hz
Power consumption	Approx. 30W
Weight	Approx. 6Kg

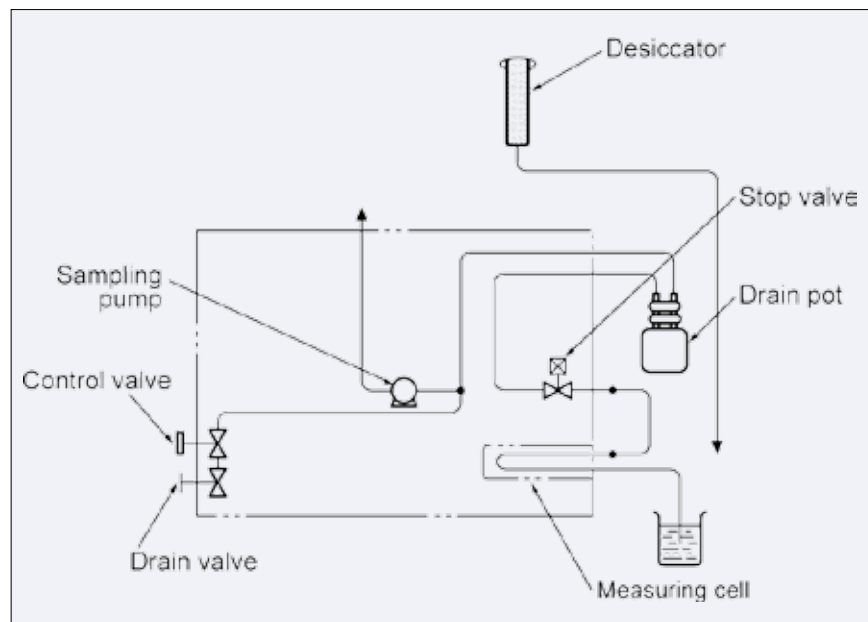
**Features:**

- Temperature can be selected in the range from 15°C to 40°C by 0.1°C step.  
Also setting in °F (59°F~104°F, 1°F step) is available.
- Can convert density/specific gravity to concentration value and display  
Conversion Equation is linear and display is in 12 different units. It enables more efficient and effective routine measurement than conventional measurement with hydrometer for API degree, Baume degree and others.
- Can output data of density, specific gravity, concentration values, date and time, etc through RS-232C and can be connected to an external computer or an optional printer.  
(External computer and printer cannot be connected at the same time).
- Parameter setting and operating is designed user-friendly, easy to use, being guided by dialogue message on display.
- Purge pump is equipped as standard to desiccate the measuring cell.
- Easy factor calibration of measuring cell can be performed using air and pure water. No complicated calculation is required.

**Options:**

Model	
ASU-100	Auto sampling unit
IDP-100	Printer

**Flow Chart of Auto Sampling Unit**





RS 25

## WSC/AWC-Series, Water Stills

### Economy Water Still

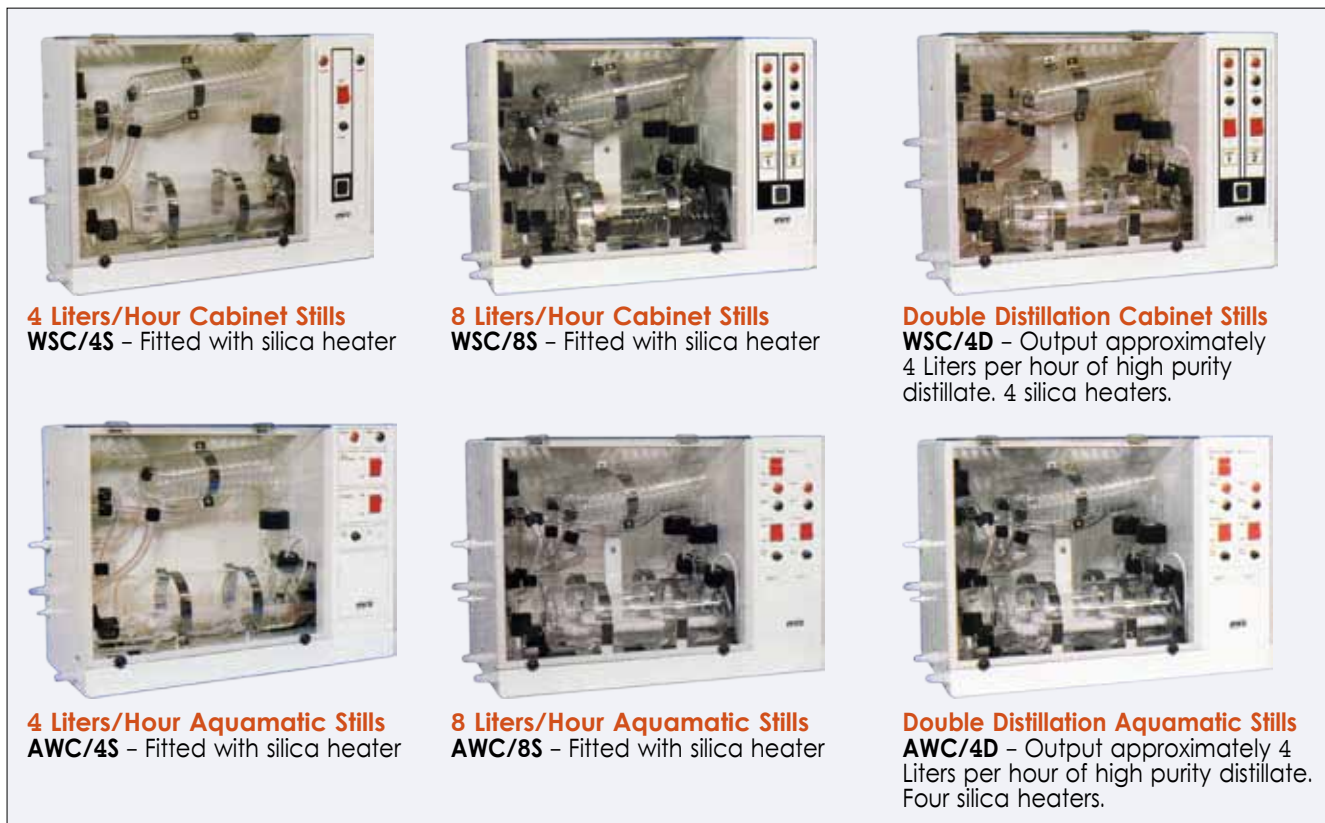
MRC economy water stills provide the same performance as 4 Liter cabinet stills.

The still features a high quality boiler & condenser distillation unit mounted on a stove enamelled metal chassis with all electric in a metal housing.

**WSE/4S - Fitted with silica heater.**



WSE/4S



**4 Liters/Hour Cabinet Stills**  
WSC/4S - Fitted with silica heater

**8 Liters/Hour Cabinet Stills**  
WSC/8S - Fitted with silica heater

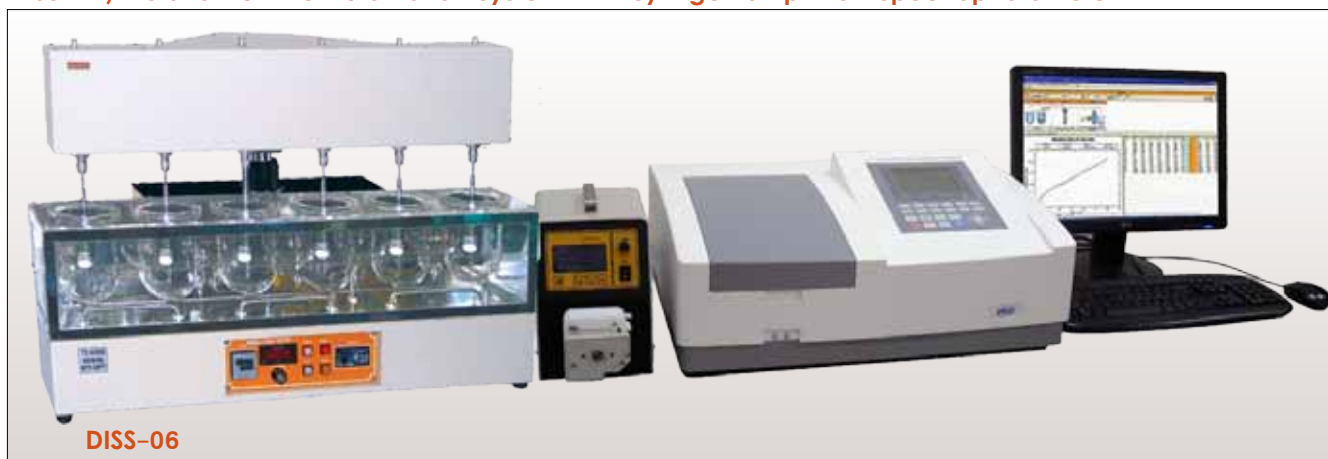
**Double Distillation Cabinet Stills**  
WSC/4D - Output approximately 4 Liters per hour of high purity distillate. 4 silica heaters.

**4 Liters/Hour Aquamatic Stills**  
AWC/4S - Fitted with silica heater

**8 Liters/Hour Aquamatic Stills**  
AWC/8S - Fitted with silica heater

**Double Distillation Aquamatic Stills**  
AWC/4D - Output approximately 4 Liters per hour of high purity distillate. Four silica heaters.

Output		4 Liter/hr	4 Liter/hr D.D	8 Liter/hr
Heaters		Silica	Silica	Silica
Wattage		2x1.5Kw	4x1.5Kw	4x1.5Kw
Power		220/240V	220/240V	220/240V
Fuse		13amps	2x13amps	2x13amps
Min. supply pressure		5psi	5psi	5psi
Dimension (mm)		H400xW590xD240	H400xW590xD340	H400xW590xD340
Incl. reservoir(mm)		H940xW590xD530	H940xW590xD530	H940xW590xD530
Net weight (kg)		12	20	20
Incl. reservoir (kg)		32	40	40
Output quality	pH	5.5-6.5	5.5-6.5	5.5-6.5
	Conductivity $\mu\text{s}/\text{cm}$	<2.5	<1.5	<2.5
	Resistivity megohm-cm	0.4	0.66	0.4
	Temperature	<35°C	<35°C	<35°C

**DISS-06, 6 Station Online Automation System With Syringe Pump & UV Spectrophotometer**

DISS-06

It is used to test the dissolution condition of chemicals under the set temperature. its rotary speed is non-limetary variation and can be adjusted at any required speed. the digital readout provides a continuously updated accurate reading of shaft rpm. the temperature of water-baths can be set to a need one, in special, it can keep up the set temperature automatically. the circuit breaker device can prevent from leakage current. thus it can provide safety when use. the paddle shafts are made of SUS 316.

**Applications:**

The MRC Pharmaceuticals Advanced Dissolution Testing System for all Dissolution Testing in the tablets, capsules, pills, pellets, solid dosage forms and various type of pharmaceuticals products for the quality control, research and developments. Also most suitable for Pharmacy Laboratories in University & Educational Institutes.

**Descriptions:**

The tablet dissolution testing is one of the most important test during the method developments and manufacturing of solid dosage forms in the pharmaceutical industries, Universities & Educational institutes in Pharmacy research laboratories. All international Pharmacopoeias require a dissolution test apparatus at least 6 samples should be tested & test vessels, rotation speed, temperatures rages, accuracy & stirrer tolerance are clearly described & specified.

Model	DISS-06
Speed (rpm)	10-250
Power	AC110V/60Hz, 220V/50/60Hz
Electric control	Step less speed control
Safety device	Low water/over heat, safety break for leakage of electricity
Temperature	Digital control system
Heater	900W
Constant temp. in water tank	Water circulation type
Fuse	10A/6A
Weight (kg)	62

**DINT-02, Disintegration Tester**

Disintegration tester, Two basket, Include full accessories: Basket, beaker, thermometer, granual cylinder disc It is used to test the disintegration condition of chemicals under the set temperature. It's shaking speed is non-limetary variation. The temperature of water baths can be set to a need one, in special, it can keep up the set temperature automatically and the circuit breaker device can prevent from leakage current. Thus, it can provide safety when use. The basket are made of SUS 316.



DINT-02

Model	DINT-02
Basket	2
Description	Cumulative time counter provide
Movement of basket	Amplitude 55mm, vertical agitation 5~40 times/min
Driving motor	8W
Heater	600W
Dimension (mm)	W470xD325xH555
Weight	22kg
Power	AC110/220V



DBD-001



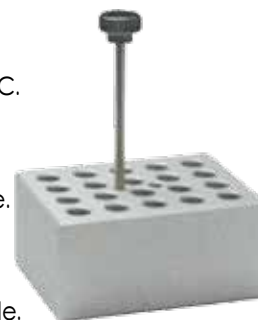
DBD-002

### DBD-001/002, Dry Bath Incubators

Useful for variety of applications in molecular biology and histology as well as clinical, environmental and industrial settings, including restriction digests, denaturing DNA, BUN, melting agar, coagulation studies, hybridization and Hot Start thermo-cycled reaction. The dry baths feature a broad temperature range, up to 150°C, and excellent uniformity. A microprocessor regulates the high wattage heater to provide precise, accurate control and rapid heating. The Aluminium block chamber ensures an even transfer of heat from the heating element to the block. Temperature is easily set using arrow keys while the value is shown on the large display. The user calibration function allows for easy calibration to in-house standards when required. Interchangeable blocks are available to accommodate a wide variety of tubes, plates and slides. Solid blocks are also available for custom machining. Each dry bath is supplied with a block lifter that enables the user to exchange blocks easily, even when the block is hot.

#### Features:

- Precise microprocessor control.
- Broad temperature range, to 150°C.
- Large digital display.
- User friendly calibration.
- Single and dual block models.
- Rapid temperature increasing rate.
- Large Digital LED display & timer.
- Used as a water bath.
- Molded aluminum alloy chamber.
- Function Control software available.



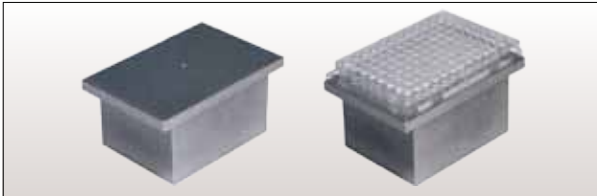
#### Ordering Information:

- **DBD-P01** - Thermocouple, optional temp. probe for DBD-001/002
- **DBD-RS232** - RS232 cable
- **DBD-PCSW** - Function control & data logging software package
- **DBD-PCSW-R** - Function control & data logging software package, includes a RS232 cable.

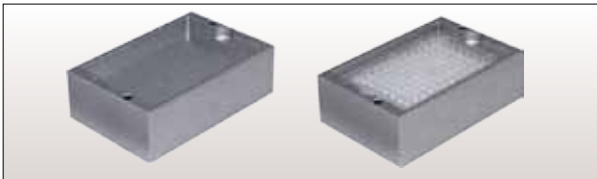
Model	DBD-001	DBD-002
Display	LED Display	
Heating power	125W	200W
Unit dimension (WxLxH)	200x290x80 mm	
Controller	Digital microprocessor controller	
Heating chamber	Molded aluminum alloy chamber	
Temperature control range	5°C Above ambient to 150°C	
Temperature increment	0.1°C	
Temperature uniformity in working area at 37°C	±0.2°C	
Temperature accuracy in working area at 37°C	±0.2°C	
Temperature calibration	Yes	
Timer	1~999 mins, continuous	
Safety device	Leakage proof for heating chamber, Over temperature protection, SSR failure detection	
Operating temperature	Ambient to 40°C	
Special feature	Used as water bath incubator	
Block material	Aluminum alloy	
Block type	Standard and customized type are available	
Data log	RS232	
Weight	approx. 2.6kg	approx. 2.8kg
Rated voltage	110V or 220V selectable	

Dry Bath Blocks are designed for Dry Bath Incubator. The precision machined aluminum alloy blocks, which are suitable for microplate and different test tubes, range from 0.2ml tube to 50ml centrifuge tube, deliver efficient heat transfer. In addition to the standard blocks, customized blocks are also available for specified user requirement.

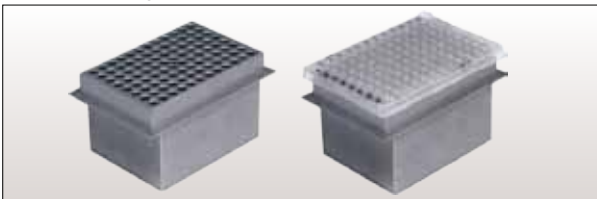
**300-1-111101:** For Microplate; Titerplate (Plain Block for Single Block unit only)



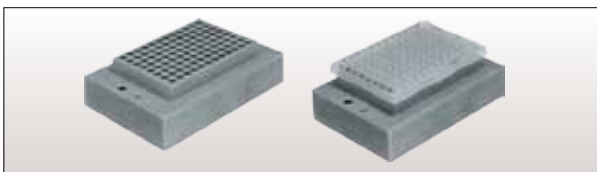
**300-1-111102:** For Microplate; Titerplate (Dual Block unit only)



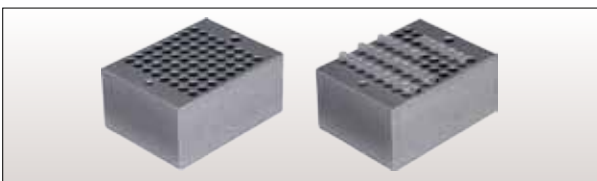
**300-1-111103:** For 96 wells Deep Microplate or PCR plate (for Single Block unit only)



**300-1-111104:** For 96 wells Deep Microplate or PCR plate (for Dual Block unit only)



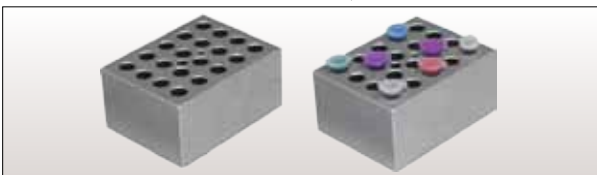
**300-1-111105:** For 0.2ml tube, 64 wells (or 0.2ml PCR Strip tube for 8 wells x 8)



**300-1-111106:** For 0.5ml tube, 20 wells



**300-1-111107:** For 1.5ml tube, 20 wells



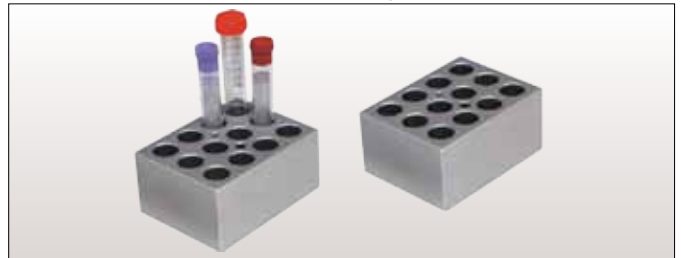
**Specifications:**

<b>Block material</b>	Aluminum alloy
<b>Dimensions (mm)</b>	W79xL104xH50
<b>Block lifter well</b>	Yes
<b>Thermometer well</b>	Yes (except microplate blocks)

**300-1-111108:** Well size 13mm, 20 wells



**300-1-111109:** For 15ml centrifuge tube, 12 wells



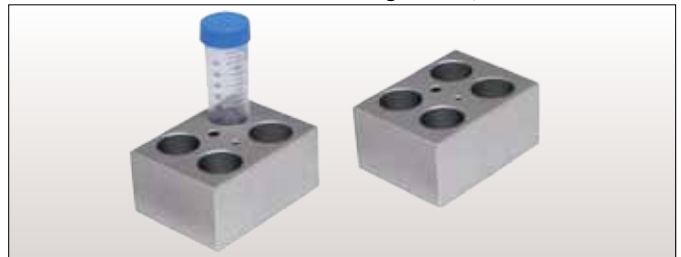
**300-1-111110:** Well size 20mm, 12 wells



**300-1-111111:** Well size 25mm, 6 wells



**300-1-111112:** For 50ml centrifuge tube, 4 wells



**300-1-111113:** One side For 1.5/2.0ml tube, 20 wells & another side For 0.5ml tube, 30 wells (on the opposite side)



**300-1-111114:** Combination: For 0.5ml tube, 12 wells & For 1.5ml tube, 12 wells (on the same side)





DBA-001

**DB-Series, Dry Bath Incubator****Features:**

- Applications for incubating DNA specimens, cross matching and screens in blood bank, incubating melted agar, Enzyme assays, digestions, Residue tests for milk & also great for serology, hematology, pathology and biochemistry etc.
- Choose from various heating blocks that accommodate test tubes, cuvettes, and micro centrifuge tubes.
- Each block has a well to accommodate a removable thermometer, which monitors temperature of blocks.
- When solid block (no holes) is used, it can function as HOT PLATE.



DBD-003

Model	DBD-003	DBD-003E	DBA-001
<b>Overall dimension(mm)</b>	370x245x135	290x290x110	210x235x115
<b>Net weight (Not include blocks)</b>	3.9kg	6.0kg	2.1kg
<b>Temp. setting</b>	Digital (3-digit)	Digital (3-digit)	Analog
<b>Temp. reading</b>	Digital LED	Digital LED	thermometer
<b>Temp. range</b>	Ambient to 99.9°C	Ambient to 150°C	25-105°C
<b>Temp. accuracy</b>	±0.1°C	±0.1°C	±0.2°C
<b>Uniformity (at 37°C)</b>	±0.2°C	±0.2°C	±0.5°C
<b>Temp. sensor</b>	PT-100	K-Type	*NTC
<b>Temp. control</b>	PID	PID	PID
<b>Overheat alarm</b>	Yes	Yes	No
<b>Heating element</b>	450W	450W	200W
<b>Timer</b>	Digital 99hr59min	Digital 99hr59min	No
<b>Insulation</b>	No	Yes	No

\*NTC: Negative Temperature Coefficient



DBD-003E

**DBD-003 & DBD-003E**

- Activate auto-off function to automatically shut out heater at the end of timed cycle.
- Digital temperature display for actual temperature PV and setting Sv.
- Timer start working when the preset temperature has been stabilized ensures an accurate incubation effect.
- When complete the heat cycling, the timer will alarm and display "END".
- Memory stores the set temperature and time of previous operation, use these set points to repeat the new operation and save time, or preset your new desired set points.

- DB-006E-150 features double wall construction with insulator by fiberglass for durability and good heat retention. Maximum temperature is designed up to 150°C capable of functioning more applications.
- Safety devices: Over temperature alarm; Heating failure alarm; Double overheating protection.

**Application:**

- Solid anodized aluminium blocks resist the hardest environments and provide maximum heat retention.
- All blocks include thermometer well for easily measuring block temperature.

Number	Tube size	Openings No. / Ø
302-1-111101	6mm	30/6.5mm
302-1-111112	10mm	20/10.5mm
302-1-111113	12 or 13mm	20/13.5mm
302-1-111114	15 or 16mm	12/16.6mm
302-1-111115	18mm	12/18.6mm
302-1-111116	20mm	12/20.7mm
302-1-111117	25mm	6/25.7mm
302-1-111118	1.5ml Eppendorf	20
302-1-111119	0.5ml Eppendorf	20
302-1-111110	25+12+6mm or your request	3+5+6 holes
302-1-111111	Solid (no holes) used as HOT PLATE	
302-1-111112	Microplate 96 wells	
<b>Block size</b>	W100xD75xL50(mm), W155xD100xL50(mm) Microplate	

**DBD-004, Dry Bath Incubator**

The MRC 4 blocks DBD-004 digital dry baths offer digital control over both temperature and time, eliminating the need for external thermometer or timer. The DBD-004 is extremely space efficient. (The four block model can accommodate up to 100x1.5ml Tubes in less than a square foot of bench space.

The cavities of the high grade aluminum blocks are precision machined to match the conical size and shape of 0.5,1.5,2.0,15 and 50ml tube sizes, providing unsurpassed temperature uniformity.

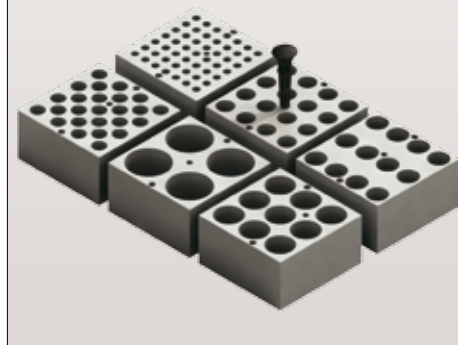
Assorted blocks are available for compatibility with nearly all common tube sizes. Custom blocks are also available upon request, .

All Bench mark dry baths offer a built-in user function, to guarantee long term temperature accuracy.

The dry bath includes an easy to use block lifter, with a temperature insulated handle for quick, convenient exchange of blocks, even while they are still hot.



DBD-004



Model	DBD-004
Temp. Control Range	RT+5°C~120°C
Timing Range	1min~99h59min
Temp. Control Accuracy @40°C	±0.3°C
Temp. Control Accuracy at 40°C~100°C	±0.5°C
Temp. Control Accuracy @120°C	±1°C
Display Accuracy	0.1°C
Heating Time (to Max. Temperature)	≤30min
Dimensions (L×W×H)mm	380×240×110
Quantity of Blocks	4
Display	LED

Model	Type	Description	Dimension (mm)
301-01081-01	BK01	49 x Ø6mm	96 x 96 x 49
301-01081-02	BK02	49 x Ø7mm	96 x 96 x 49
301-01081-03	BK03	25 x Ø10mm	96 x 96 x 49
301-01081-04	BK04	25 x Ø12mm	96 x 96 x 49
301-01081-05	BK05	25 x Ø13mm	96 x 96 x 49
301-01081-06	BK06	12 x Ø15mm	96 x 96 x 49
301-01081-07	BK07	16 x Ø15mm	96 x 96 x 49
301-01081-08	BK08	12 x Ø16mm	96 x 96 x 49
301-01081-09	BK09	16 x Ø16mm	96 x 96 x 49
301-01081-10	BK10	12 x Ø19mm	96 x 96 x 49
301-01081-11	BK11	16 x Ø19mm	96 x 96 x 49
301-01081-12	BK12	9 x Ø20mm	96 x 96 x 49
301-01081-13	BK13	9 x Ø26mm	96 x 96 x 49
301-01081-14	BK14	4 x Ø28mm	96 x 96 x 49
301-01081-15	BK15	4 x Ø40mm	96 x 96 x 49
301-01081-16	BK16	49 x 0.5ml tubes	96 x 96 x 49
301-01081-17	BK17	25 x 1.5ml tubes	96 x 96 x 49
301-01081-18	BK18	25 x 2.0ml tubes	96 x 96 x 49

**Features:**

- LED display
- Current temperature and count down time display
- Metal blocks free of sample counter-pollution
- Easy replacement, cleaning and disinfecting of metal blocks
- Built-in over-temperature protection
- Calibrating temperature discrepancy
- Buzzer alarm when temperature control ends
- Only heating design and Custom blocks are available.

# DRY BATHS Mini, Battery Operates, Programmer

Heating only, Temp. range: ambient to 100°C



DBM-H

Heating/Cooling+Programmer



DBM-CP

## DBM Series, Cooling/Heating Dry Baths

DBM Series cooling/heating dry baths meet all temperature requirements from 0-100°C in a Molecular Biology Lab, It plays the role of all-in-one small box combining the functions of ice box, refrigerator, incubator, water bath, circulator, heater etc.

**Heater:** Model DBM-H/HB can only heat and its temperature ranges from ambient-100°C.

**Cooling/Heating Dry Bath:** Model DBM-C/CB ranges from 0-100°C.

**Programmable Dry Bath:** Model DBM-CP/CPB let you do your experiments at specific temperature for certain time and after the program completes, it automatically stops your reaction by going down to 4°C. DBM-CP/CPB can run up to 3 segments. time and temperature continuously.

### Features:

- Modular designed blocks, mix and match tubes from 0.2mL to 50mL and accommodates 96 well plates, flat bottom plates and slides.
- Small footprint, can work in a hood, or lab automation systems.
- 12V 5A DC input, energy efficient, a car charger & rechargeable battery pack can be ordered.
- Fast chilling/heating rate, precise temp. control.
- Clean and maintenance free.

Heating/Cooling  
0°C to 100°C



DBM-C

### Specifications for DBM-CP/CPB:

- Power supply: 12V DC, 5A.
- Temperature range: 0°C to 100°C.
- Time Range: 1 min to 23 hr 59 min.
- Temperature precision:  $\pm 0.2^\circ\text{C}$ .
- Display resolution: 0.1°C.
- Sample block temperature evenness:  $\pm 0.5^\circ\text{C}$ .
- Average heating rate from 16°C to 60°C: 8°C / min.\*
- Average chilling rate from 60°C to 16°C: 3°C / min.\*
- Average chilling rate from 25°C to 4°C: 3°C / min.\*
- Electrical input: 12 V DC, 5A.
- Dimensions: 185x185x90 mm (7.25x7.25x3.5 in).
- Working area dimensions: 110 x 72.5 mm (fits a standard 96 well plate).
- Net Weight: 1.4 kg.
- Gross Weight: 2.5 kg.

\* Room temperature at 25°C, with 4 0.2mL blocks.

### DBM-H/DBM-HB:

- Ambient~100°C.
- Heating only, temperature adjustable.
- Only for DBM-HB: Battery operated.

### DBM-C/DBM-CB:

- 0-100°C.
- Cooling/heating.
- Adjustable temperature.
- Only for DBM-CB: Battery operated.

### DBM-CP/DBM-CPB:

- 0-100°C.
- Cooling/heating.
- Time & temp. control.
- Programmable.
- Run up to 3 segments of time and temp. continuously.
- Only for DBM-CPB: Battery operated.

### Accessories:



1 Lid, 4 Blocks

### Blocks:



DBM-B0.2x24



DBM-B0.5x12



DBM-B1.5x6



DBM-B2x6



DBM-B15x6



DBM-B50x3



DBM-B96





DBD-64

DBD-128

**DBD-64/DBD-128, Larger Blocks, Larger Capacities**

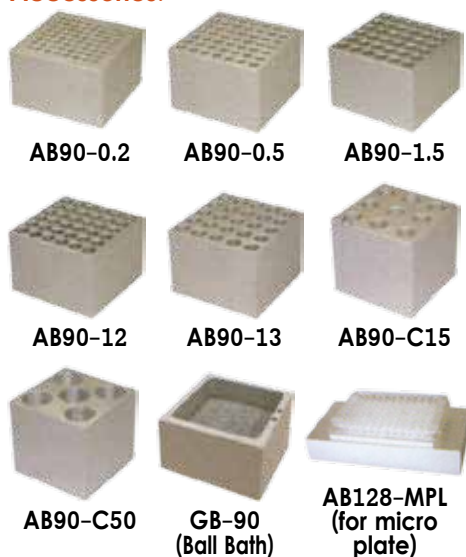
- Digital microprocessor control (PID) for highest accuracy.
- A variety of changeable blocks.
- Special thick blocks guarantee excellent temperature stability.
- Standard flat covers for protecting the user from accidentally touching a hot block and spitting tubes.
- Safety features:
  - Flashing alarm lamp to warn over-temp.
  - Over-temperature cut-out.
  - Over temperature safety thermostat.



Model	DBD-64	DBD-128
Temp. Range	Ambient +5°C ~ 150°C	
Temp. Accuracy	±0.5°C	
Timer	1min~99h59min	
Heating Method	Cartridge Heater	
Capacity	1Block	2Blocks
Material	Energy plate and sample block: Aluminum Inside and insulating side: Stainless steel	
Weight	4kg (without block)	7kg (without block)
Dimensions (mm)	148W×230D×155H	238W×230D×155H
Wattage	250W	600W
Power	AC 110V/220V/230V, 50/60Hz	

Other types of blocks are available upon special request

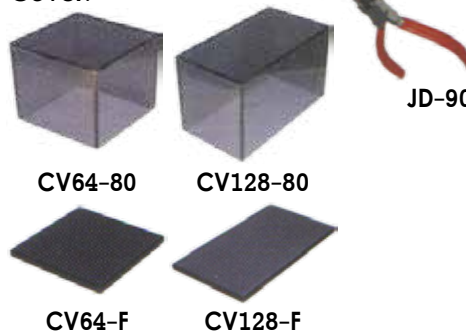
**Accessories:**



**Blocks:**

AB90-0.2	Block / 0.2ml centrifuge tube (90x90xH60) capacity: 64ea
AB90-0.5	Block / 0.5ml centrifuge tube (90x90xH60) capacity: 49ea
AB90-1.5	Block / 1.5ml centrifuge tube (90x90xH60) capacity: 36ea
AB90-12	Block / 12 Ø test tube (90x90xH60) capacity: 36ea
AB90-13	Block / 13 Ø test tube (90x90xH60) capacity: 25ea
AB90-15	Block / 15 Ø test tube (90x90xH60) capacity: 25ea
AB90-16.5	Block / 16.5 Ø test tube (90x90xH60) capacity: 20ea
AB90-18	Block / 18 Ø test tube (90x90xH60) capacity: 20ea
AB90-C15	Block / 15ml conical tube (90x90xH80) capacity: 9ea
AB90-C50	Block / 50ml conical tube (90x90xH80) capacity: 5ea
GB90	Ball bath (zinc ball)
AB128-MPL	Block plate / micro plate- capacity: 1ea (for DBD-128)

**Cover:**



**Other Accessories:**

Model Number	Description
JD90	Block extraction tool
CV64-80	High cover for Test tube (W115xD115xH80mm)
CV128-80	High cover for Test tube (W230xD115xH80mm)

**DBC-001, Cool-Heater Dry Bath Incubator**

Cool-Hotter Dry Bath Incubator is available with different temperature performance, along with a competitive range of interchangeable block. It is designed for a variety of applications including ligation, storage, restriction digests, denaturing DNA, BUN, melting agar, coagulation studies, hybridization and Hot Start thermo-cycled reaction. The fully programmability contains Constant Operation, Programmable Mode, and Annealing Mode. A 2.6" LCD screen, showing all the running / setting conditions. Microprocessor controller offers easy temperature selection, rapid heat up and cooling down with an excellent stability. The temperature can be set in  $0.1^{\circ}\text{C}$  increments from  $-10^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ . Optional Function Control software is available for the control & real time data recording through a PC for specified user requirement.



DBC-001

**Features:**

- Microprocessor control with digital performance for precise, accurate control.
- Wide temperature control range & great temperature controlled performance.
- Rapid temperature increasing rate.
- LCD screen shows all the parameters during run.
- User temp. calibration.
- Can be used as a water bath.
- Function Control software available.

Back Panel  
DBC-001**Ordering Information:**

- **DBC-PCSW** - Function control & data logging software package
- **DBC-PCSW-R** - Function control & data logging software package, includes a RS232 cable
- **DBC-LID-N** - LID for DBC-001.

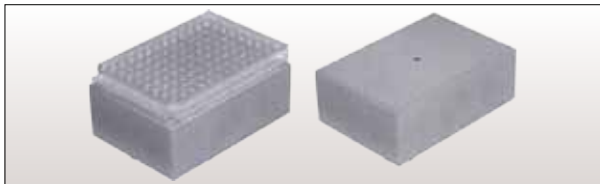
Model	DBC-001
Chamber dimensions (mm)	W129xL90xH46
Display	2.6" LED
Heating power	400W
Unit dimension (mm)	W200xL290xH140
Controller	Digital microprocessor controller
Heating chamber	Water-proof aluminum
Temperature control range	$-10^{\circ}\text{C}$ ~ $100^{\circ}\text{C}$ In the environment of $25^{\circ}\text{C}$
Temperature increment	$0.1^{\circ}\text{C}$
Temp. uniformity in working area at $37^{\circ}\text{C}$	$\pm 0.2^{\circ}\text{C}$
Temp. accuracy in working area at $37^{\circ}\text{C}$	$\pm 0.2^{\circ}\text{C}$
Temperature calibration	Yes
Operation mode	Constant operation: constant temperature ( $-10^{\circ}\text{C}$ ~ $100^{\circ}\text{C}$ ), Timer: 1~9999 mins, Program operation: 1~4 steps and up to 9 cycles, Timer: 1~9999 mins, Annealing program
Safety device	Leakage proof for heating chamber
Operating temperature	Ambient to $40^{\circ}\text{C}$
Special feature	Can be used as water bath incubator
Block material	Aluminum alloy
Block type	Standard and customized type are available
Data log	RS232
Weight	approx. 8kg
Rated voltage	110V or 220V selectable

**Cool-Heat Dry Bath Blocks**

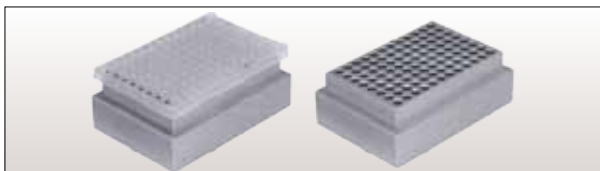
Non-porous aluminium for fast & efficient heat transfer, include a position for a thermometer, specially designed hole for lifting tool.

- Corrosion resistant, anodized aluminium.
- Blocks for tubes from 0.2ml to 0.5ml, plates & slides.
- Precision machined for a close fit and efficient heat transfer.
- Solid block available for custom machining.

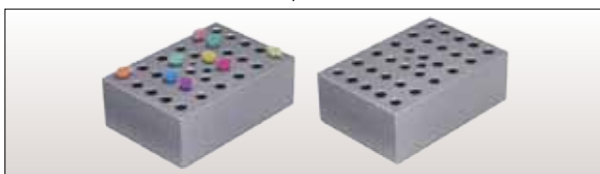
**300-1-111201:** For Microplate; Titerplate (Plain Block)



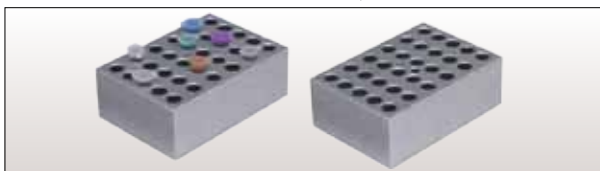
**300-1-111202:** For 96 wells Deep Microplate or PCR plate



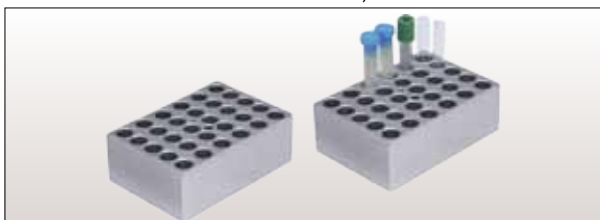
**300-1-111203:** For 0.5ml, 30 wells



**300-1-111204:** For 1.5 or 2.0ml, 30 wells



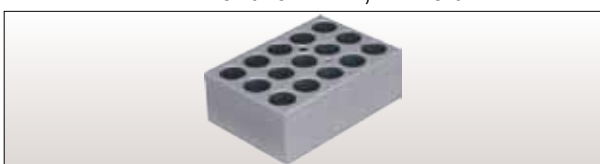
**300-1-111205:** Well size 13mm, 30 wells



**300-1-111206:** For 15ml centrifuge tube, 15 wells

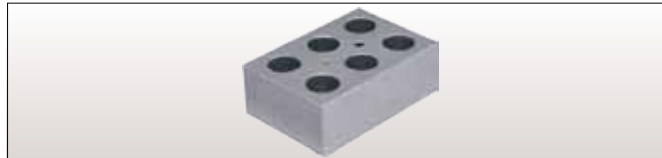


**300-1-111207:** Well size 20mm, 15 wells



Model	300-1-11120x
Block material	Aluminum alloy
Dimensions (mm)	W90xL127xH50
Block lifter well	Yes
Thermometer well	Yes (except microplate blocks)

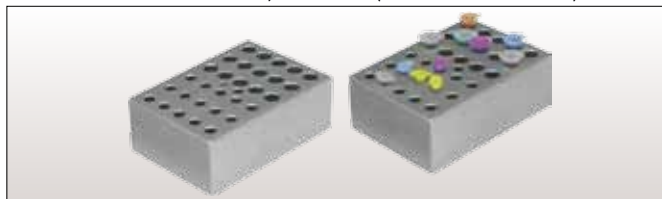
**300-1-111208:** Well size 25mm, 6 wells



**300-1-111209:** For 50ml centrifuge tube, 6 wells



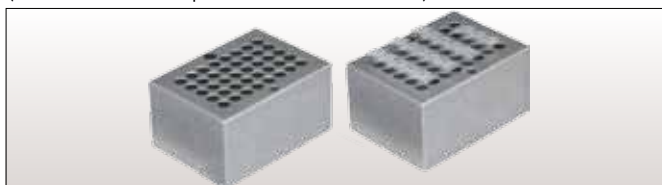
**300-1-111210:** Combination: 1.5ml or 2.0ml tube, 15 wells and 0.5ml tube, 15 wells (on the same side)



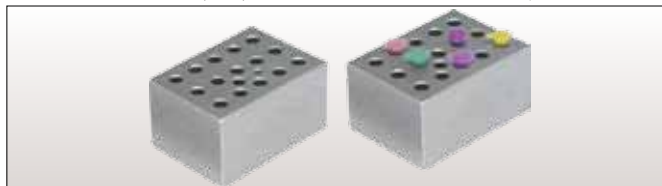
**300-1-111211:** Combination: 0.2ml tube (or strip tube for 8 wells), 24 wells; 1.5ml or 2.0ml tube, 10 wells



**300-1-111212:** (1/2) Half block for 0.2ml tube, 40 wells (or 0.2ml PCR Strip tube for 8 wells x 5)



**300-1-111213:** (1/2) Half block for 0.5ml tube, 15 wells



**300-1-111214:** (1/2) Half block for 1.5 or 2ml tube, 15 wells





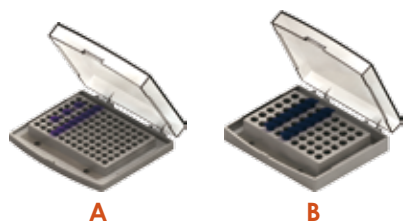
DBC-002

**DBC-002, Cool/Heat Dry Bath Incubator –  $10^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$** 

The DBC-001 Dry Bath Incubator is a microprocessor-controlled product using advanced thermoelectric technique. With this technical, more stable and accurate temperature control is achieved. Replacement is convenient with optional metal block of various specifications configured for different types of test tubes.

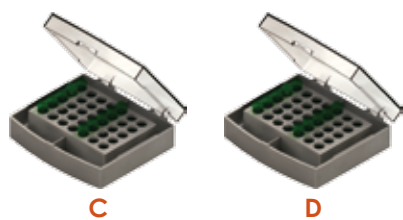
**Features:**

- LCD display easy to setup and use.
- Simultaneous display of set and actual time/temperature.
- Temperature deflection adjusting meet with different demands.
- As it is equipped with various optional blocks, the instrument can adapt to different tubes & wells to cope with experimental needs. It is easy to replace the metal blocks and is very simple to clean and sterilize
- Customized blocks are available to suit your specific demands.
- Microprocessor controlled incubation time and temp.
- Beep-signal/Stop after program completed.
- Peltier design of DBC-20 provides efficient thermal control.



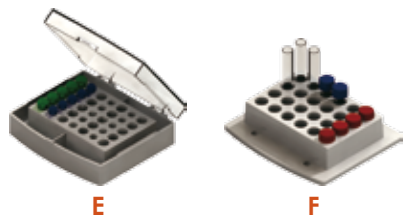
A

B



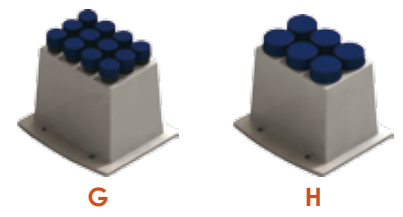
C

D



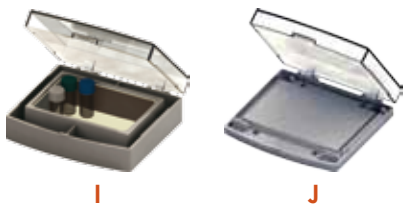
E

F



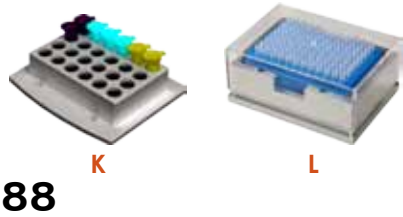
G

H



I

J



K

L

Model	DBC-002
Temp. Control Range	$-10^{\circ}\text{C}$ ~ $100^{\circ}\text{C}$
Timing Range	1min~99h59min
Temp. Control Accuracy	$\pm 0.5^{\circ}\text{C}$
Display Accuracy	$0.1^{\circ}\text{C}$
Heating Time ( $20^{\circ}\text{C}$ to $100^{\circ}\text{C}$ )	$\leq 20$ min
Cooling Time ( $20^{\circ}\text{C}$ to $-10^{\circ}\text{C}$ )	$\leq 30$ min (*)
Heating Part	Peltier
Cooling Part	Peltier
Dimensions (L×W×H) mm	300×212×180
Certificate	CE
Net Weight	5.0kg

\*1) Cooling speed  $\leq 25$ min ( $20^{\circ}\text{C}$  to  $-5^{\circ}\text{C}$ ) if the room temperature is lower than  $30^{\circ}\text{C}$

\*2) Cooling speed  $\leq 30$ min ( $20^{\circ}\text{C}$  to  $-10^{\circ}\text{C}$ ) if the room temperature is lower than  $25^{\circ}\text{C}$ .

Model	Type	Description
301-1-111101	A	96 x 0.2ml
301-1-111102	B	54 x 0.5ml
301-1-111103	C	35 x 1.5ml
301-1-111104	D	35 x 2.0ml
301-1-111105	E	15 x 0.5ml+20 x 1.5ml
301-1-111106	F	24 x Diameter $\leq 12$ mm tubes
301-1-111107	G	12 x 15ml Falcon tubes
301-1-111108	H	6 x 50ml Falcon tubes
301-1-111109	I	103 x 67 x 30mm Bath Block
301-1-111110	J	96 x 0.2ml Microplate
301-1-111111	K	24 x 5ml tubes
301-1-111112	L	96-Deep well plate

**DBC-6400, Cooling and heating in one unit**

- Digital microprocessor control (PID); Digital display.
- Independent cooling and heating systems for years of trouble-free operation.
- A variety of interchangeable insert blocks.
- Block combined with the close fit of the tubes for fast efficient heat transfer.
- Special thicker blocks guarantee excellent temperature stability.
- Safety features:
  - Flashing alarm lamp to warn over-temperature.
  - Over-temperature cut-out.
  - Over temperature safety thermostat.



Other types of blocks are available upon special request

**Accessories: Blocks for ALB-6400**

AB90-0.2

AB90-0.5

AB90-1.5



AB90-12

AB90-13

AB90-C15



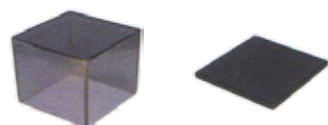
AB90-C50

GB-90  
(Ball Bath)

JD-90

**Blocks:**

<b>AB90-0.2</b>	Block / 0.2ml centrifuge tube (90x90xH60) capacity: 64ea
<b>AB90-0.5</b>	Block / 0.5ml centrifuge tube (90x90xH60) capacity: 49ea
<b>AB90-1.5</b>	Block / 1.5ml centrifuge tube (90x90xH60) capacity: 36ea
<b>AB90-12</b>	Block / 12 Ø test tube (90x90xH60) capacity: 36ea
<b>AB90-13</b>	Block / 13 Ø test tube (90x90xH60) capacity: 25ea
<b>AB90-15</b>	Block / 15 Ø test tube (90x90xH60) capacity: 25ea
<b>AB90-16.5</b>	Block / 16.5 Ø test tube (90x90xH60) capacity: 20ea
<b>AB90-18</b>	Block / 18 Ø test tube (90x90xH60) capacity: 20ea
<b>AB90-C15</b>	Block / 15ml conical tube (90x90xH80) capacity: 9ea
<b>AB90-C50</b>	Block / 50ml conical tube (90x90xH80) capacity: 5ea

**Cover:**

CV6400-80

CV6400-F

**Other Accessories:**

Model Number	Description
<b>JD90</b>	Block extraction tool
<b>GB-90</b>	Ball bath (zinc ball)
<b>CV6400-80</b>	High cover for Test tube (W115xD115xH80mm)

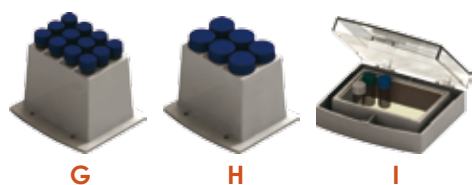
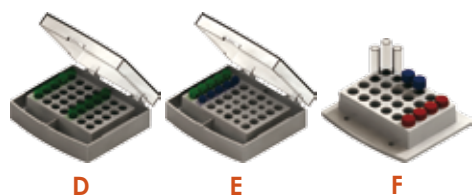
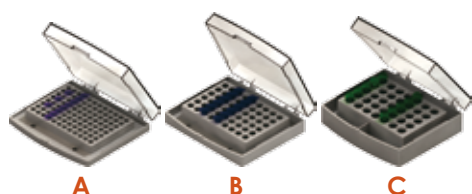
**DBS-001/DBSC-001-100, Thermo Shaker Incubator**

Designed for simultaneous heating, cooling and mixing of small samples. Both DBS-001 and DBSC-001 can be supplied with interchangeable blocks to match various tubes. Mixing, heating and cooling modes can be used either simultaneously or independently. The main Mixing body can be used with different kinds of blocks.

**Features:**

- LCD display, easy to setup and use.
- Accurate control and display time, temperature and speed.
- Over-heating protection device ensures safety & reliability.
- Low working noise even when working below 1,500rpm.
- Customized blocks are available to suit your specific demands.
- Audible signal to indicate end of run after program completion.
- Gentle, reliable mixing with long-life direct current motor.
- Conforms to CE safety standard.
- Peltier design of DBS-001 provides thermal control in a compact unit.

Model	DBS-001	DBSC-001
<b>Temp. Control Range</b>	RT+5°C~100°C	0°C~100°C if Ambient Temp. ≤20°C 4°C~100°C if Ambient Temp. ≤25°C 10°C~100°C if Ambient Temp. ≤30°C
<b>Temperature Setting Range</b>	5°C~100°C	0°C~100°C
<b>Timing Range</b>	1min~99h59min	
<b>Temp. Control Accuracy</b>	±0.5°C	
<b>Display Accuracy</b>	0.1°C	
<b>Heating Time (20°C to 100°C)</b>	≤15min	
<b>Cooling Time</b>	---	≤30min (from RT. to RT.-20°C) ≤15min (from 100°C to 20°C)
<b>Mixing Speed</b>	200~1500rpm	
<b>Mixing Orbit</b>	2mm	
<b>Dimensions (L×W×H) mm</b>	300×220×170	
<b>Net Weight</b>	7kg	8.5kg



Model	Type	Description
301-1-111101	A	96 x 0.2ml
301-1-111102	B	54 x 0.5ml
301-1-111103	C	35 x 1.5ml
301-1-111104	D	35 x 2.0ml
301-1-111105	E	15 x 0.5ml+20 x 1.5ml
301-1-111106	F	24 x Diameter≤12mm tubes
301-1-111107	G	12 x 15ml Falcon tubes
301-1-111108	H	6 x 50ml Falcon tubes
301-1-111109	I	103 x 67 x 30mm Bath Block
301-1-111110	J	96 x 0.2ml Microplate
301-1-111111	K	24 x 5ml tubes
301-1-111112	L	96-Deep well plate



Blocks



Tube Holders

**DBS-002/DBS-003, Turbo Thermo Shaker Incubator**

The fastest functions-rich, thermo-shaker for multiple applications in the world.

**Highlights:**

- Thermo shaker for microplates, tubes, and glass vials.
- Fast shaking and mixing up to 3,000rpm.
- 3D-Shake-Control: efficient and fast controlled orbital mixing movements, eliminating any need for centrifugation after mixing.
- Perfectly controlled 3 dimensional mixing prevents spilling and lid wetting.
- Highly accurate processing and Anti-Vibration Technology eliminate vibrations for a relaxed working environment.
- 2 programmable soft keys, integrated vortex and short mix functions.
- Very small, light, efficient and quiet.
- Adapter plates:

**Microplates:** 96, 384, & 1536-well microplates/deepwell plates/PCR plates.

**Holder:** 0.2ml PCR tubes holder, 0.5ml tubes holder, 1.5/2.0ml tubes holder.  
15ml Micro tubes holder, -50ml Micro tubes holder

**Block:** 10 types Aluminum blocks for user choosing.

Model	DBS-002	DBS-003
Mixing frequency	300~3000rpm	300~1700rpm
Mixing orbit	2mm	3mm
Speed setting resolution	10rpm increment	
Mixing accuracy	±25rpm	
Short-Mix function	Yes	
Temp. Control Range	RT+5°C~100°C	
Temperature Setting	0.1°C increment	
Timing Range	±0.1°C	
Temperature Accuracy	±0.25°C at 37°C	±0.5°C at 95°C
Heating Time	≤12min	
Time setting	1min~100h	
Time setting resolution	1min	
Continuous working	Yes	
Programs stored	2	
Individual program capacity	3 steps	
Internal memory	Yes	
Operation voltage	24V DC 150W	
Power supply	AC100~240V	
Dimensions (L×W×H) mm	230×170×130	
Weight	4.5kg	

Model	Type	Description
301-02051-01	A-200	96 x 0.2ml
301-02051-02	B-200	54 x 0.5ml
301-02051-03	C-200	35 x 1.5ml
301-02051-04	D-200	35 x 2.0ml
301-02051-05	E-200	15 x 0.5ml + 20 x 1.5ml
301-02051-06	F-200	24 x Dia Φ.1 ≤2mm tubes
301-02051-07	G-200	32 x 0.2ml + 25 x 1.5ml
301-02051-08	H-200	32x0.2ml + 10x0.5ml + 15x1.5ml
301-02051-09	I-200	103 x 67 x 30mm Bath Block
301-02051-10	J-200	96 x 0.2ml Microplate
301-02031-01	MIX-A	0.2ml PCR Tube Holder
301-02031-02	MIX-B	0.5ml Tube Holder
301-02031-03	MIX-C	1.5/2.0ml Tube Holder
301-02031-04	MIX-D	8 x 15ml Tube Holder
301-02031-05	MIX-E	3 x 50ml Tube Holder

DBG-001



DBG-002



Blocks

**DBG-001/DBG-002, Sample Concentration**

The instrument consists of a base and stand assembly, sample holder and gas distribution system. Test tubes are held in a block. The gas at 5 to 10 psig passes through the distribution manifold. Depending on the test-tube size and solvent volume they can be individually raised or lowered to the correct height. Needles or glass Pipettes blow gas onto the surface of the solution resulting in rapid evaporation of the solvent.

**Features:**

- High precision and wide range of temperature control.
- Blowing a large number of samples at 1 time.
- Blowing each sample independently.
- Amount of airflow can be adjusted.
- Easy operation; safe and reliable to use.



Valve

Model	DBG-001	DBG-002
Temp. Control Range	RT+5°C~150°C	
Timer	1min~99h59min	
Display	LED	
Temp. Control Accuracy @40~100°C	±0.5°C	
Temp. Control Accuracy @100~150°C	1°C	
Display Accuracy	0.1°C	
Heating Time(40°C~150°C)	≤30min	
Standard Blocks	1	2
Nitrogen Consumption	0~10L/min	
Dimensions (L×W×H) mm	280×240×110	
Needle Length	150mm	

Model	Type	Description	Dimensions (mm)
301-01081-01	BK01	49×Φ6mm	96×96×49
301-01081-02	BK02	49×Φ7mm	96×96×49
301-01081-03	BK03	25×Φ10mm	96×96×49
301-01081-04	BK04	25×Φ12mm	96×96×49
301-01081-05	BK05	25×Φ13mm	96×96×49
301-01081-06	BK06	12×Φ15mm	96×96×49
301-01081-07	BK07	16×Φ15mm	96×96×49
301-01081-08	BK08	12×Φ16mm	96×96×49
301-01081-09	BK09	16×Φ16mm	96×96×49
301-01081-10	BK10	12×Φ19mm	96×96×49
301-01081-11	BK11	16×Φ19mm	96×96×49
301-01081-12	BK12	9×Φ20mm	96×96×49
301-01081-13	BK13	9×Φ26mm	96×96×49
301-01081-14	BK14	4×Φ28mm	96×96×49
301-01081-15	BK15	4×Φ40mm	96×96×49
301-01081-16	BK16	49×0.5ml tubes	96×96×49
301-01081-17	BK17	25×1.5ml tubes	96×96×49
301-01081-18	BK18	25×2.0ml tubes	96×96×49
301-01081-19	BK19	96×0.2ml tubes	78×114×26
301-01081-20	BK20	96×0.2ml microplate	81×123×19





DBG-003

**DBG-003, Sample Concentration, Each Sample Independently**

**Features:**

- High precision and wide range of temperature control.
- Blowing at a large number of samples at one time.
- Blowing each sample independently.
- Amount of airflow can be adjusted.
- Easy operation; safe and reliable to use.
- Low Nitrogen consumption of 330ml/min/sample.

Model	DBG-003
Temperature Control Range	RT+5°C-150°C
Temperature control discrepancy	≤±1°C (RT+5°C~100°C) ≤±1.5°C (100°C~150°C)
Heating time (from 40°C to 150°C)	≤30min
Processing timer	1min~99h59min
Maximum input power	400W
Temp. control discrepancy	0.1°C
Deedles length	150mm
Capacity	12 pcs
Dimensions (L×W×H)mm	280×240×500

Model	Type	Description	Dimensions (mm)
301-06091-01	BD01	12×Φ10mm	192×96×49
301-06091-02	BD02	12×Φ12mm	192×96×49
301-06091-03	BD03	12×Φ13mm	192×96×49
301-06091-04	BD04	12×Φ15mm	192×96×49
301-06091-05	BD05	12×Φ16mm	192×96×49
301-06091-06	BD06	12×Φ19mm	192×96×49
301-06091-07	BD07	12×Φ20mm	192×96×49



DBD-SAMPLER

**DBD-SAMPLER, Manual Head Space Sampler**

Head space analysis has generally been limited to costly automated systems – until now! This manual sampler enables to utilise the head space technique in a quantitative, economical and precise manner. Analyses up to six samples at a time using all popular vial sizes, from 2 to 27ml.

**Features:**

- Volatile in pharmaceuticals.
- Flavours analysis.
- Alcohol and other toxic compounds in blood.
- Screening of volatile in all type of environmental samples e. g. soils, waters, plastics, polymers, etc.

Model	DBD-SAMPLER
Heating temperature range	RT+5°C-100°C
Variable injection	up to 2.5ml
Temperature accuracy	±0.5°C
Holds up to 6 vials of	2, 10, 20ml
Stabilization time from 20ml vials: 8minutes	25°C to 70°C with 1ml syringe and 6 empty



STEP-1



STEP-2



STEP-3



STEP-4



STEP-5

### DBD-2000-1/2/Dual, Dry Bath Incubator

DBD-2000 Series dry bath incubator are ideal for incubation and activation of cultures, enzyme reactions, blood urea nitrogen determinations, immunoassays, melting/boiling points, and a wide variety of other laboratory procedures. The economical, superb temperature control and compact dry bath incubators are designed for applications that require repeatable results and superior temperature stability.

The DBD-Dual dry bath incubator is an innovative design accommodating two blocks with independent digital temperature control. Each block can be set to different temperatures - ideal for multiple users or for applications where samples have to be transferred between two temperatures very quickly.

One Block



DBD-2000-1

Two Blocks



DBD-2000-2

Dual Independent Channels



DBD-Dual



Blocks

#### Features:

- Exceptional temperature uniformity and accuracy thanks to advanced temperature control combined with high quality, precision engineered blocks providing excellent thermal contact.
- Wide range of interchangeable aluminium blocks.
- Heat to 105°C, optional external temperature probe.
- Blocks available as accessories for all applications - tubes, vials and microplates.
- Block extraction tool is supplied, allowing blocks to be removed easily.



One Block

DBD-2000-1

Model	DBD-2000-1	DBD-2000-2	DBD-Dual
<b>Temp. Control Range</b>	RT+5°C~105°C	RT+5°C~105°C	RT+5°C~105°C
<b>Timing Range</b>	1min~99h59min	1min~99h59min	1min~99h59min
<b>Temp. Stability @100°C</b>	±0.4°C	±0.4°C	±0.4°C
<b>Uniformity: within the block @ 37°C across similar blocks @ 37°C</b>	±0.2°C -	±0.2°C ±0.3°C	±0.2°C -
<b>Display Accuracy</b>	0.1°C	0.1°C	0.1°C
<b>Heating Time (25°C to 100°C)</b>	≤15min	≤15min	≤15min
<b>Block Quantity</b>	1	2	2
<b>Dimensions (LxWxH)mm</b>	250x190x130	365x210x150	365x210x150
<b>Weight</b>	2.5kg	4.5kg	4.5kg
<b>Optional external temperature probe</b>	Yes	Yes	Yes

Model	Type	Description
301-01181-01	BH01	96 x 0.2ml tubes
301-01181-02	BH02	45 x 0.5ml tubes
301-01181-03	BH03	35 x 1.5ml tubes
301-01181-04	BH04	35 x 2.0ml tubes
301-01181-05	BH05	15 x 0.5ml+20 x 1.5ml
301-01181-06	BH06	20 x 1.5ml+15 x 2.0ml
301-01181-07	BH07	32 x 0.2ml+22 x 0.5ml+ 9 x 1.5ml
301-01181-08	BH08	20 x 5ml tubes
301-01181-09	BH09	20 x 10ml tubes
301-01181-10	BH10	12 x 15ml tubes
301-01181-11	BH11	6 x 50ml tubes
301-01181-12	BH12	96 x 0.2ml Elisa plate or 4 slides
301-01181-13	BH13	Solid block (no holes)
301-01181-14	BH14	384 well PCR Plate
301-01181-15	BH15	40 x Ø6mm tubes
301-01181-16	BH16	28 x Ø10mm tubes
301-01181-17	BH17	24 x Ø12mm tubes
301-01181-18	BH18	24 x Ø13mm tubes
301-01181-19	BH19	14 x Ø15mm tubes
301-01181-20	BH20	14 x Ø16mm tubes
301-01181-21	BH21	12 x Ø19mm tubes
301-01181-22	BH22	11 x Ø20mm tubes
301-01181-23	BH23	6 x Ø26mm tubes
301-01181-24	BH24	6 x Ø28mm tubes
301-01181-25	BH25	2 x Ø40mm tubes
301-01181-26	BH26	2 x 7 - 12.5 x 12.5 (Cuvette)
301-01181-27	PT1000	External temperature probe
301-01181-28	T4	Block extraction tool



SDH-12

- 1 Touch screen, easy to read and use
- 2 12 slides with superior temperature uniformity
- 3 Heating lid and lid seals tightly will maintain uniform temperature and humidity.

**SDH-12, Slide Denaturation/Hybridization System**

**Ideal for denaturation/hybridization of fluorescent in-situ hybridization procedure**

Programmable system and humidifying that automates the steps in a slide-based FISH procedure, and provides walk-away convenience for clinical and research personnel. The low cost unit accepts a wide range of sample types, is easy to use, and reduces hands-on time by more than 50% while ensuring overall precision and accuracy in all FISH assays. Up to 12 slides can easily be added or removed with one hand. Two-side heating of slides that allows achieving exact correspondence of the set and actual temperature and maintaining uniform temperature across all slide positions.

**Features:**

**User Programmable Settings**

- Touch screen allows for easy to read and easy programming
- 99 user programmable settings
- Five operation modes: denaturation/hybridization, hybridization fixed temperature, custom, In-situ PCR
- Can be used as a fixed temperature slide warmer

**Easy to user**

- Eliminates manual steps & reduces hands-on time during FISH procedures
- Slides do not need to be fully loaded to maintain temperature accuracy
- Slide guide keeps slides in place and allows for one hand removal

**More stringent temperature control**

- Rapid temperature ramp-up and accuracy of  $\pm 1^{\circ}\text{C}$
- Superior temperature uniformity across all slide positions
- Programmable system, it can be runned In-situ PCR experiments

**Ideal for humidity control**

- Perfect lid seals tightly will maintain uniform temperature and ensure humidity across all slide positions.



SDH-12 closed

Model	SDH-12
<b>Temp. Range</b>	RT+5°C~100°C
<b>Temp. Accuracy</b>	$\pm 1^{\circ}\text{C}$
<b>Temp. Uniform</b>	$\pm 1^{\circ}\text{C}$
<b>Processing Timer</b>	1min~99h59min
<b>Heating Time (37°C to 95°C)</b>	$\leq 3\text{min}$
<b>Cooling Time (95°C to 45°C)</b>	$\leq 5\text{min}$
<b>Temp. Control Programmable</b>	30°C~100°C
<b>Capacity</b>	12 Slides
<b>Overall DIM.</b>	L420xW225xH143mm
<b>Net Weight</b>	6kg



K37-24

**K37-24, Gel Cards ID Incubator**

**Features:**

- Incubator for 24-Gel Cards in racks at 37°C
- 2 independent incubation zones with a capacity for 12 Gel cards
- Digital interface screen for control and visualization of remaining incubation time and real temperature for each zone
- Fixed pre-set temperature of 37°C
- Pre-set incubation time of 15 minutes, which can be adjusted by the user
- Audible programmable alarm to notify end of incubation period.

Model	K37-24
<b>Capacity</b>	24 Gel cards
<b>Temperature</b>	37°C
<b>Timer</b>	15min (Variable)
<b>Power</b>	AC220V or AC120V 50-60Hz, 300W
<b>Dimensions (DxWxH)mm</b>	380x220x115

## DBD2000-2HLP, Dry Bath Incubator Programmer

The dry bath incubator incorporate thermal cycle's heating lid technology, twin blocks and touch screen products with a patent.



### Features:

- Exceptional temperature uniformity and accuracy - due to advanced temperature control combined with high quality, precision engineered blocks providing excellent thermal contact.
- Hold a heating lid, 60 user programmable settings.
- Touch screen allows for easy to read & easy programming & easy to use.
- Programmable system and program link functions, it can be run some simple PCR tests.
- Block extraction tool is supplied, allowing blocks to be removed easily.

Model	DBD2000-2HLP
<b>Temp. Control Range</b>	RT+5°C~100°C
<b>Stability @ 100°C</b>	±0.4°C
<b>Uniformity: within the block @ 37°C across similar blocks @ 37°C</b>	±0.2°C ±0.3°C
<b>Display Accuracy/Display</b>	0.1 °C/Touch Screen
<b>Heating Time (25°C to 100°C)</b>	≤15min
<b>Timing Range</b>	1 min-99h59min
<b>Block Quantity</b>	2
<b>Dimensions (LxWxH)mm</b>	380x210x160
<b>Weight</b>	5.5kg

Model	Type	Description
301-01181-01	BH01	96 x 0.2ml PCR tubes
301-01181-02	BH02	45 x 0.5ml tubes
301-01181-03	BH03	35 x 1.5ml tubes
301-01181-04	BH04	35 x 2.0ml tubes
301-01181-05	BH05	15x0.5ml + 20x1.5ml tubes
301-01181-06	BH06	20x1.5ml + 15x2.0ml tubes
301-01181-07	BH07	32x0.2ml + 22x0.5ml + 9x1.5ml
301-01181-08	BH08	20 x 5ml tubes
301-01181-12	BH12	96 x 0.2ml Elisa plate or 4 slides
301-01181-13	BH13	Solid block (no holes)
301-01181-14	BH14	384 well PCR Plate
301-01181-28	T4	Block extraction tool
301-01211-01	L4	Stainless plate

## DBR-002 Mini, COD Thermoreactor



The DBR-002 features six pre-set common programs to ease the lab work. It also allows user-tailored program for repeated custom procedures. The digital display provides precise temperature setting.

### Safety-first philosophy design:

- Hot warning status light: to indicate heating progress
- PPS board on the top to minimize risk of scald
- Auto stop when end of running time
- Overheating protection safety device: Automatic heat cutoff when the temperature is over 220°C
- Splash resistant design: Avoiding sample permeating from panel.

### Features:

- Ideal tube tests for COD, TOC, total nitrogen, total chromium, etc.
- COD digestion and specialized tasks in wastewater treatments & laboratories PPS board fully insulated heater block for protection.
- Program started with auto or manual mode selectable after pre-heating.
- Auto stop when end of running time.
- Easy and friendly to use.
- Large LCD screen with status LED indicator.
- Light and sound alarm to indicate complete of digestion.
- Six pre-stored and one user defined programs with pre-heating function.
- Automatically back-to-last mode when powering.
- Build-in real-time clock.
- Overheating protection.

Model	DBR-002
<b>Reactor type</b>	Dry temperature control device
<b>Number of vial cells</b>	16 cell shafts for reaction cell 16mm ±0.2mm
<b>Temperature Setting</b>	100°C/ 120°C/ 150°C via fixed programs, and 50°C to 199°C user setting
<b>Controlling accuracy</b>	±1°C (±1 digit)
<b>Temperature stability</b>	±1°C
<b>Heating rate (with empty thermoblock) from 25°C to</b>	100°C approx 5min ; 120°C approx 6min 150°C approx 9min ; 199°C approx 15min
<b>Pre-stored programs</b>	150°C/2 hour ; 150°C/20 min. ; 120°C/2 hour 120°C/1 hour ; 120°C/30 min. ; 100°C/1 hour
<b>Programmable temp. range</b>	50°C to 199°C
<b>Programmable time range</b>	0~18hr. Audio signal and heating stopped when the time expired
<b>Temperature correction</b>	±9°C adjust for thermoblock
<b>Ambient temperature</b>	10~50°C
<b>Overheating protector</b>	Auto stop heating when temp. over 220°C
<b>Power supply</b>	220VAC, ±10%, 50/60Hz,
<b>Power consumption</b>	250W
<b>Dimensions</b>	320X210X103mm(LxWxH)
<b>Weight</b>	Approx 3kg



Chemical digestion of the samples is a prerequisite such as: tests, determination of COD, TOC, total phosphate, nitrogen etc. The required temperature & reaction time are programmed using the membrane keypad on the front of the reactor. When digestion is complete, the reactor automatically switches off & sounds an alarm. DBR-001 COD reactor is designed to meet USEPA 410.4 method. It can be used to digest closed 1 micro reflux COD vial and other samples which diameter is 16mm.

Further, it is safer and easier than traditional open macro reflex method. Unique COD program let DBR-001 to be a truly automatic reactor. When the reactor is powered on, just click the start/stop button, then it starts to heat to 150°C and keep for 2 hours then stop heating with an audio alarm. Samples are ready to be measured by colorimeter when they cool down. DBR-001 COD reactor is compatible with any COD detectors which use 16mm COD vials. In addition to COD program, DBR-001 is a microprocessor controlled block heater, with temperature range from 60°C to 200°C and timer from 0 to 999 minutes or continuous operation, and 3 extra self-made heating programs can be stored.

**For The Digestion Of:**

- COD (150°C)
- TOC (120°C)
- Total chromium (100°C)
- Total nitrogen (100°C)
- Total phosphate (100°C)

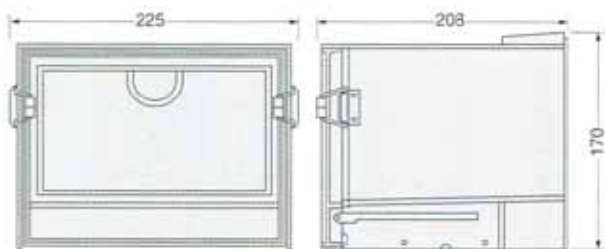
**Features:**

- Approved by ERA (method 410.4) of USA and most of the countries in the world.
- Safer and easier than traditional open reflex method.
- Save lab top space, power and water consumption.
- Reduce waste & maximize safety.
- Unique COD program makes it truly automatic.

Model	DBR-001 COD REACTOR
Read out	4 Digital LED of set temperature, set time, process temperature, residual time display
Timer	1~999 minutes with audible alarm and automatic shut off or continuous operation
Accuracy	±2°C (at 150°C)
Temperature	Fixed 150°C (COD program) 60°C~200°C, adjustable
Safety	Hot top indicator (flashing when block temperature is over 70°C (Automatic shut off when block temperature is over 210°C)
Block capacity	25 of 16mm Ø sample vials, Option block(with 8x20mm Ø and 6x25mm Ø vial holes) is available
Structure	Housing: stainless steel with power paint coating, Block: Anodized aluminum
Power	AC110 or AC220V, 50/60Hz, 220Watt
Dimensions	W18.9xH11.6xD31.5mm
Weight	Net 4.5kg Gross 6.1kg



0050



## 0050, Mini Desiccator Cabinet

### Specifications:

- Injection molded PS cabinet is sturdy and unbreakable.
- Sides and door are completely transparent for easy viewing.
- The door AS made has a foam rubber gasket and roller latches for an airtight seal.
- When opened, the door slides into an out-of-the-way compartment beneath the cabinet.
- Smoky transparent cabinet is excellent for protecting light-sensitive materials.
- Suitable for the storage of highly sensitive components.
- Stackable to save bench top space.
- Materials: PS (Polystyrene)
- Compartment inside DIM.: W195 x D154 x H113mm
- (Accessories): 1 jar of moisture-absorbing silica gel in each compartment.

Model	Specifications	Outside dimension (mm)
0050	1 Level	W225 x D208 x H170



0040

## 0030/0040, Dry Keepers

Auto type adopts a high performance dehumidification unit ED-1 which maintains the Inside humidity at 30% to 40%RH. (With silica gel regeneration function. Troublesome replacement is unnecessary.)

Non-auto type has a pan for silica gel and is convenient. Also use in applications other than dehumidification.

- Since there may be cases when the error produced by sudden humidity changes and shock becomes large, use the hygrometer supplied with the auto type only as a guide.

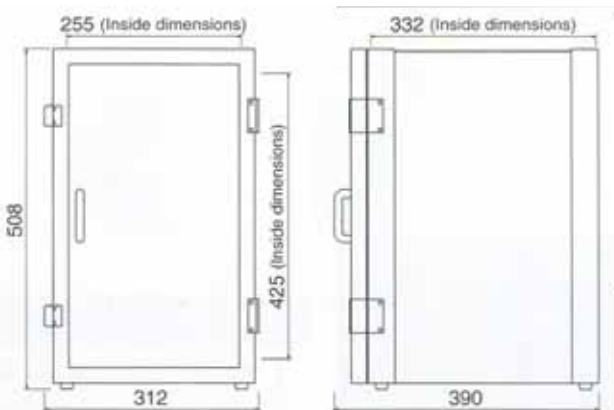
- The inside humidity is slightly different depending on the room temperature and usage conditions. Frame black. body smoky transparent.



0030

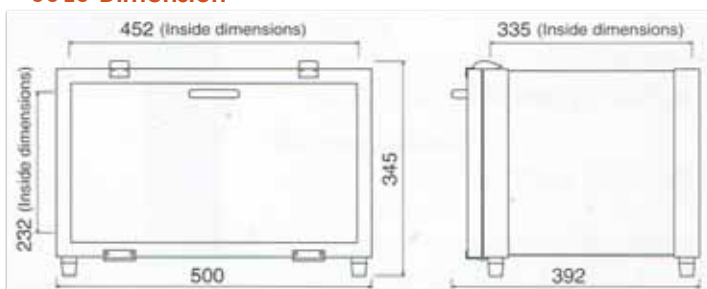
Functions and strength are improved markedly by combining molded parts. Shelf plates can be adjusted in 15 steps at 28mm intervals to match the size of the stored items.

### 0030 Dimensions



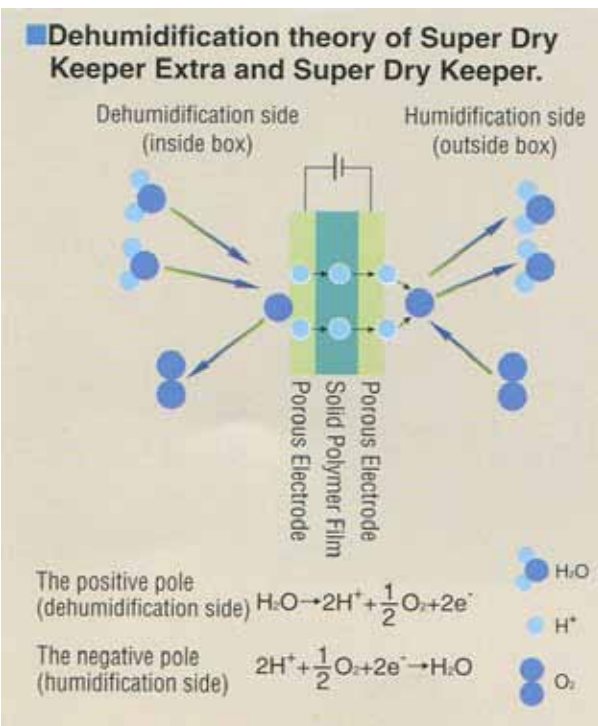
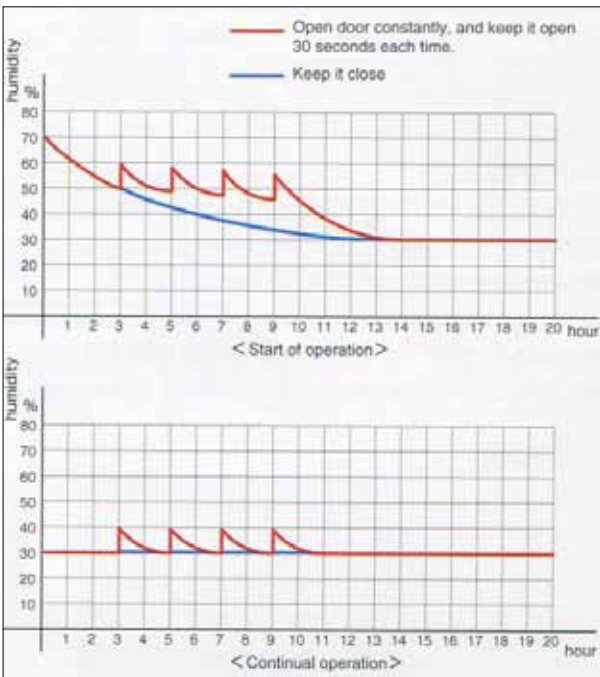
Model	Type
0030	Latch door type Shelf plate 3 plates
0040	Latch door type Shelf plate 2 plates

### 0040 Dimension





0010



**0003/0010, Auto Dry Keepers**

**Features:**

- Full automatic system. Replacement of silica gel is unnecessary. Humidity inside the refrigerator at normal temperature is maintained at 30% to 40%RH, and is perfect for long-term storage.
- Functions and strength are improved markedly by combining molded parts.
- Dehumidification capability is improved substantially by adoption of a fan for inside air circulation convection flow.
- Shelf plates can be adjusted in 15 steps at 28mm intervals to match the size of the stored items.
- Slim vertical type design does not take up space.



0003

<b>External dimensions</b>	312 (W) x 390 (D) x 617 (H) mm
<b>Effective inner dimensions</b>	255 (W) x 332 (D) x 428 (H) mm
<b>Dehumidifier</b>	Solid molecular electrolytic film
<b>Dehumidification capacity</b>	4g/day*
<b>Humidity control method</b>	ON-OFF control
<b>The humid. control range</b>	30% RH to atmospheric humidity
<b>Humidity sensor</b>	Capacitance type polymer sensor
<b>Humidity sensor accuracy</b>	±3% RH (25°C, 5 to 95% RH)
<b>Power source</b>	Single-phase AC100V 50 160Hz
<b>Power consumption</b>	8W
<b>Weight</b>	Approx.7kg
<b>Operating ambient temp.</b>	o to 40°C

• This is an initial value at 30°C of temperature, 60% of humidity, and in RH. (Dehumidification capacity declines gradually as use. Please be informed that the degree of deterioration varies with the operating environment or conditions.)

Model	Type
0003	Latch door type Shelf plate 3 plates
0010	Latch door type Shelf plate 2 plates

**Note:** - We only have 100V specification. - It requires additional transformer in order to use it in other countries.

# DRY CABINETS Steel Housing

## DYC Series, Dry Cabinets

These dry cabinets with the thermoelectric dehumidifying system are used to store the materials and objects that require low humidity. It is used in the electric and semiconductor industry to store IC wafers, electronic components. Additional in the pharmaceutical laboratories it is used to store reagents, specimens, chemicals standards and medicines. As well it is used to store optical instruments: cameras, lenses, microscopes and optical products: films, video tapes, slides, microfilms, CD, DVD, X-ray films. There are 11 models with 5 choices: standard-20% RH and Super dry-10% RH, Super super dry-5% RH, Ultra superdry-2% & Nitrogen supply-1%, 1mm electro galvanized steel housing, 5mm tempered foggy glass door, plastic frame with lock and key.



**DYC - 20% RH**  
**DYC-S - 10% RH**  
**DYC-SS - 5% RH**  
**DYC-NS - 1% RH**

**DYC-68**

**DYC-82**

**DYC-116**

**DYC-141**

### DYC-68

Ex: W400xD430xH560mm  
 In: W398xD375xH480mm  
 Capacity: 68L  
 Drawer: 2 Pcs  
 Weight: 15 Kgs  
 Cons: 12W

### DYC-82

Ex: W400xD430xH660mm  
 In: W398xD375xH580mm  
 Capacity: 82L  
 Drawer: 2 Pcs  
 Weight: 17 Kgs  
 Cons: 12W

### DYC-116

Ex: W400xD430xH890mm  
 In: W398xD375xH820mm  
 Capacity: 116L  
 Drawer: 3 Pcs  
 Weight: 20 Kgs  
 Cons: 13W

### DYC-141

Ex: W400xD440xH980mm  
 In: W438xD385xH900mm  
 Capacity: 141L  
 Drawer: 3 Pcs  
 Weight: 25 Kgs  
 Cons: 13W



**DYC-228**

**DYC-230**

**DYC-320/DYC-560**

### DYC-228

Ex: W400xD530xH1290mm  
 In: W398xD475xH1210mm  
 Capacity: 228L  
 Drawer: 5 Pcs  
 Weight: 30 Kgs  
 Cons: 25W

### DYC-230

Ex: W600xD480xH970mm  
 In: W598xD425xH900mm  
 Capacity: 230L  
 Drawer: 3 Pcs  
 Weight: 30 Kgs  
 Cons: 25W

### DYC-320

Ex: W890xD480xH980mm  
 In: W888xD430xH900mm  
 Capacity: 320L  
 Drawer: 3 Pcs  
 Weight: 43 Kgs  
 Cons: 25W

### DYC-560

Ex: W890xD810xH980mm  
 In: W888xD755xH900mm  
 Capacity: 560L  
 Drawer: 3 Pcs  
 Weight: 50 Kgs  
 Cons: 31W





DYC-450/DYC-545/DYC-646

**DYC-450**

Ex: W1200xD480xH1055mm  
 In: W1198xD425xH900mm  
 Capacity: 450L  
 Drawer: 3 Pcs  
 Weight: 55 Kgs  
 Cons: 31W

**DYC-646**

Ex: W1400xD600xH1055mm  
 In: W1398xD545xH900mm  
 Capacity: 646L  
 Drawer: 3 Pcs  
 Weight: 68 Kgs  
 Cons: 31W

**DYC-545**

Ex: W1200xD570xH1055mm  
 In: W1198xD515xH900mm  
 Capacity: 545L  
 Drawer: 3 Pcs  
 Weight: 60 Kgs  
 Cons: 31W

<b>Photographic Instrument</b> Camera, Lenses, Films, Binocular, Color slide, Micro film	<b>Office &amp; Home use</b> LD, CD, Video tape, Paintings, Stamps, Dry foods, Antiques	<b>Computers Industry</b> PC Board, IC, SMD, Floppy disc, Electronic chip	<b>Hospital &amp; Medical</b> Reagent, X Ray film, Herb, Medicine, Medical equipment	<b>School &amp; Laboratory</b> Microscope, Precision instrument, Educational equipment

**DYC 20%RH:** Suitable for: Optics, Old Books, Stamps, Paintings.

**DYC-S 10%RH:** Suitable for: Chemical, Petrochemical, Pharmaceutical, Metal & Food industries & Research institutes.

**DYC-SS 5%RH:** Suitable for: Food, Wafer & Chemical industry, Electronic manufacturers, Research institutes & Any companies need to comply with IPC/JEDEC J-STD-033 regulation.

**DYC-US 2%RH:** Suitable for: Semiconducting, Wafer & Chemical industry, Electronic manufacturers, Research institute & Any companies need to comply with IPC/JEDEC J-STD-033 regulation.

**DYC-NS 1%RH:** Suitable for: Food, Wafer & Chemical industry, Electronic manufacturers & Factories with nitrogen supply system.



DYC-478

DYC-748

DYC-1500

DYC-1518

**DYC-478**

EX: W600xD750xH1353mm  
 IN: W598xD695xH1190mm  
 Capacity: 478L Shelf: 3Pcs  
 Weight: 60Kgs Cons: 31W  
 With Caster

**DYC-748**

EX: W600xD750xH1980mm  
 IN: W598xD695xH1810mm  
 Capacity: 748L Shelf: 5Pcs  
 Weight: 75Kgs Cons: 31W  
 With Caster

**DYC-1500**

EX: W1200xD750xH1980mm  
 IN: W1198x0695xH1810mm  
 Capacity: 1500L Shelf: 5Pcs  
 Weight: 120Kgs Cons: 57W  
 With Caster

**DYC-1518**

EX: W1200xD750xH1990mm  
 IN: W1198xD695xH1830mm  
 Capacity: 1518L Shelf: 5PCS  
 Weight: 125Kgs Cons: 57W  
 With Caster

# DRY CABINETS Pyrex Desiccators, Wood, Drawers

## 12-305x-Series, Vacuum Pyrex Desiccator

THE MRC desiccator is a laboratory vessel with a ground lid, which is suitable for use under vacuum. It is used for the storage of substances that are sensitive to moisture and for drying moist products. The lower part is divided by a sieve plate and serves as a receptacle for water-absorbent substances such as anhydrous calcium chloride. These drying agents draw out the moisture from the substance to be dried. Drying agents should not be placed directly in the desiccator. Rather, an appropriately sized crystallizing dish should be filled with the drying agent and place it inside.



Place the substance to be dried on the sieve plate and close the desiccator tightly. All MRC desiccators are suitable for use under vacuum.

- With ground stopcocks
- With porcelain plate
- Highly transparent PC (Polycarbonate) that is strong, allows for clear sample viewing, is non-corrosive, is easy to clean & maintain
- The basic component of the drying agent tray with descant allows the round desiccators to be used in various experiments under non vacuum conditions
- Convenient 3-Way stopcock provide easy vacuum release during operating
- Lock holds the bottom and top lid together under non vacuum conditions.

Model	Size (mm)	Porcelain plate diameter (mm)	Overall height
12-3050	160	148	285
12-3051	210	188	347
12-0352	240	220	381
12-3053	300	280	467

## DYC-313Series/DYD-950, Classic Wood Series

DYC - 20% RH  
 DYC-S - 10% RH  
 DYC-NS - 1% RH



### Specimen Drawers Cabinet 20% RH



**DYC-313W**  
 EX: W912xD538xH915mm  
 IN: W860xD440xH830mm  
 Capacity: 313L Shelf: 3Pcs  
 Weight:45Kgs  
 Max/avg 60W/22W

**DYC-313GW**  
 EX: W912xD538xH915mm  
 IN: W865xD440xH790mm  
 Capacity: 313L Shelf: 3Pcs  
 Weight: 50Kgs  
 Max/avg 60W/22

**DYD-950 Specimen Drawers Cabinet**  
 EX: W1200xD600xH1800mm  
 IN: W560xD500xH1720mm x2  
 Incl:30 Pcs specimen box  
 Capacity: 950L  
 Max/avg 90W/29W

**Digital Dry Cabinet-Drawers**

**Model DYD-150, DYD-200, DYD-250, DYD-500, DYD-720,**

1 mm Electro-galvanized steel housing, steel ball slide drawer, capable to load 30 kgs.

**Model DYD-160, DYD-240, DYD-320,**

1 mm Electro-galvanized steel housing, 10 roller slide drawer, capable to load 50 kgs.



**DYD-150**

Ex: W460xD660xH710mm  
In: W388xD540xH150mm x3  
Capacity: 150L  
Drawer: 3 Pcs  
Weight: 40Kgs  
Cons: 25W

**DYD-160**

Ex: W460xD660xH778mm  
In: W383xD540xH280mm x2  
Capacity: 160L  
Drawer: 2 Pcs  
Weight: 38Kgs  
Cons: 13W

**DYD-200**

Ex: W460xD660xH908mm  
In: W388xD540xH150mm x4  
Capacity: 200L  
Drawer: 4 Pcs  
Weight: 50Kgs  
Cons: 25W

**DYD-240**

Ex: W460xD660xH1108mm  
In: W383xD540xH280mm x3  
Capacity: 240L  
Drawer: 3 Pcs  
Weight: 50Kgs  
Cons: 25W



**DYD - 20% RH**  
**DYD-S - 10% RH**  
**DYD-NS - 1% RH**

**DYD-250**

**DYD-250**  
Ex: W460xD660xH1110mm  
In: W388xD540xH150mm x5  
Capacity: 250L  
Drawer: 5 Pcs  
Weight: 60Kgs  
Cons: 25W

**DYD-320**

**DYD-320**  
Ex: W460xD660xH1530mm  
In: W383xD540xH280mm x4  
Capacity: 320L  
Drawer: 4 Pcs  
Weight: 68Kgs  
Cons: 25W  
With caster

**DYD-500**

**DYD-500**  
Ex: W890xD660xH1190mm  
In: W818xD540xH150mm x5  
Capacity: 500L  
Drawer: 5 Pcs  
Weight: 70Kgs  
Cons: 31W  
With caster

**DYD-720**

**DYD-720**  
Ex: W1000xD750xH1190mm  
In: W928xD640xH150mm x5  
Capacity: 720L  
Drawer: 5 Pcs  
Weight: 80Kgs  
Cons: 31W  
With caster



## PCH-Series, Pharmaceutical Cabinet With HEPA N-99 & Activated Charcoal Filter

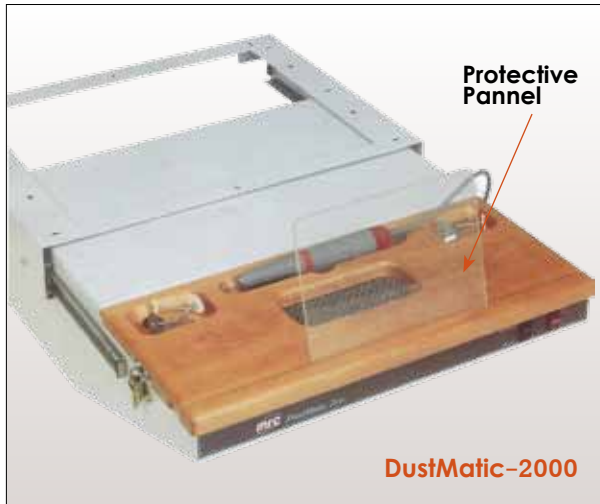
### Features:

- 1 mm galvanized steel housing with powder coating.
- Equipped with HEPA N-99 filter to take off particles and active charcoal for eliminating VOC (ie. Toluene, acetone, oxybenzene etc.) and corrosive gas (ie. NOx, SO<sub>2</sub>, CO, HCl, NH<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub> etc.).
- Filter timer can show the life time of filters.
- Shelves: retractable shelves with height adjust interval of 5cm and 5cm deep of over-flow proof edges.

### Applications:

- Chemical industry
- Petrochemical industry
- Pharmaceutical industry
- Food industry
- Research institutes

Model		PCH-574	PCH-1188	PCH-1196
<b>Power Supply</b>		100~120 VAC 1 phase 50/60 Hz; 200~240 VAC 1 (or 3) phase 50 (or 60) Hz;		
<b>Max Current (A)</b>	<b>100~120V</b>	1.2A	2.0A	2.0A
	<b>200~240V</b>	0.6A	1.0A	1.0A
<b>Humidity Control System</b>		Microcomputer P.I.D control with automatic crash release device (watch dog) in case of system down.		
<b>Ambient Temperature</b>		+5 ~ +40°C		
<b>Performance</b>	<b>Humidity Range</b>	20~60%RH		
	<b>Humidity Fluctuation</b>	±2%RH		
	<b>Humidity Method</b>	Physical semiconductor cooling chip		
	<b>Humidity Draw Down Rate</b>	40%RH within 3 hours; 20%RH within 24 hours (free load)		
<b>Chamber Structure</b>	<b>Material</b>	1 mm thick galvanized steel plate with powder coating, 5mm tempered glass front panel		
	<b>Chamber Air Circulator</b>	Propeller impeller		
<b>Shelves</b>		Drawer type with 10 cm fringe at each side (front side 5 cm) and adjustable height of 5 cm interval		
<b>Filters</b>		Conform with BP/USP Standard: HEPA N99 filter (for particle); Active charcoal (for order elimination)		
<b>Control Panel</b>		19x219mm 5 keys membrane touch key pad. 5 LED indicators. Dual 3 digits temperature display for setup and current temperature value.		
<b>Programmable Control</b>		99 batches (repeatable up to 999 times)		
<b>Datalogger</b>		Built-in 8192 sets of parameter (unlimited when connect to computer), Recording interval: 30 sec ~ 24 hrs		
<b>Computer Connection</b>		RS-232; RS-485 (remote controllable); RJ-45 (control & monitor via internet) (OPTIONAL)		
<b>Safety Devices</b>		Timer for fun control; alarm buzzing and display flashing when humidity level exceed or less than preset %RH over predefined lasting time.		
<b>Fittings</b>		Viewing window (5mm glass), Power cord, Handle, Lock		
<b>Accessories</b>		Caster wheels, Stabilizers, Key, Instruction manual, Warranty		
<b>Inside Capacity (Liter)</b>		574	1188	1196
<b>Dimensions</b>	<b>Inside Dimensions (mm)</b>	W618 D600 H1400	W1278 D600 H1400	W1278 D600 H1410
	<b>Outside Dimensions (mm)</b>	W620 D750 H2000	W1280 D750 H2000	W1280 D750 H2010
<b>Weight (Kg)</b>		80	130	125

**DustMatic-2000, Dust Drawer**

A dust-suction drawer of optimal quality and design, featuring innumerable advantages and improvements in almost all fields of operation, efficiency, user-friendliness, etc.

- Operation is fully automatic: on starting the micromotor, the drawer starts operating, on stopping the micromotor, suction switches off after 20 seconds have elapsed.
- Ergonomic design and construction with first quality materials.
- The working surface is made of beech-wood, giving it a modern look, and allowing for comfortable working.
- Silent, powerful, maintenance-free low pressure induction motor.
- Large-dimensioned, easy-to-change, filter bag (according to international Standards).
- Small-dimensioned drawer, capable of fitting most lab workbenches, with ample leg-room.
- Low operational costs. Easy to install, requires no special tools or training.

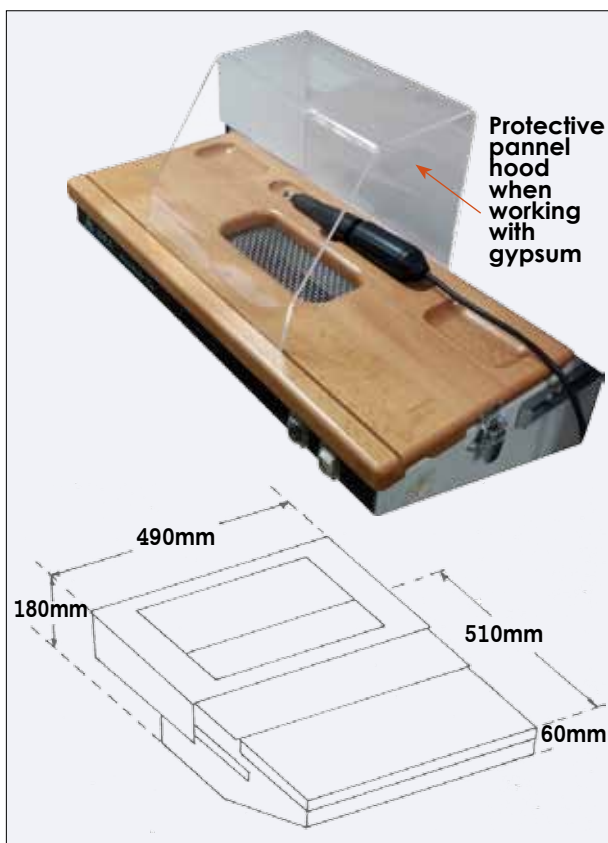
**Applications:**

- Dental
- Ear Phones manufacturer
- Artificial Eye manufacturer
- Beauty manicure
- Jewelry manufacturer.

**Include:**

Suction drawer complete, with micro-respirable dust filter bag & protective panel.

- Effective suction with large suction bag.
- Silent, maintenance free & applicable for continuous operation.
- Easy mountable under every table.
- Size: 490x510x180mm.
- Weight: 14Kg
- Wattage: 100Watt
- Air Volume: 350m<sup>3</sup>/h.





### TES-1600, Insulation Tester

- 2000M W /1000V, 200M W /500V, 200M W /250V.
- Power lock for 3 minutes (Auto power off).
- Auto-Zero adjustment.
- Data-Hold-Function.
- Digital readout easy to obtain by 0.65" LCD display.
- Automatic unit & sign annunciator.
- Rotary switch easy for range selection.
- Continuity beeper.
- Battery operated/Overload Protection.
- Safety test leads.
- 1mA test current.

General Specifications	
Display	3.5 digit 0.65" large LCD
Sampling rate (AID)	2.5 time/sec
Zero adjustment	Automatically
Operating temp. & Storage Environment	0°C-40°C <80% R.H. -10°C to 60°C <70% R.H.
Power source	6 'AA' 1.5V batteries
Dimension	165(L)x 100(W)x57(H) mm
Weight	500g
Accessories	Test leads, 6pcs. of battery, carrying case and manual

### MEG OHMS

Range	Resolution	Accuracy	Terminal Voltage	Test Current
200 MΩ/250V	0.1 MΩ	±(3% of rdg + 3dgt)	250V+10%	1mA at 250KΩ load
200 MΩ/500V	0.1 MΩ		500V+10%	1mA at 500KΩ load
2000 MΩ/1000V	1 MΩ		1000V+10%	1mA at 1 MΩ load

### OHMS

Range	Resolution	Accuracy	Max. Open Circuit Voltage	Overload Protection
200Ω	0.1Ω	± (1% of rdg + 2dgt)	3.3V	500V DC/AC

### Continuity Beeper

Range	Resolution	Accuracy	Max. Open Circuit Voltage	Overload Protection
200Ω	0.1Ω	Resistance < 100Ω	3.3V	500V DC/AC

### AC Voltage (40Hz-500Hz)

Range	Resolution	Accuracy	Max. Open Circuit Voltage	Overload Protection
750V	1V	± (0.8% of rdg+3dgt)	10 MΩ	1100 VCD & 800 VAC



### DM-9680 KITS, multimeter, kits, RS232 cable+ software+ carrying case

- Multi function measurement : ACV, DCV, ACA, DCA, OHM, Continuity Beeper, Transistor hFE, Diode,
- Meet IEC safety requirement.
- High accuracy in measuring.
- High internal impedance assures minimum measuring error.
- Rotary function switch, easy operation.
- Large size LCD display, easy reading.
- LCD display, clear readout even in high ambient light environment.
- Compact, light weight & excellent operativeness.
- Overload protection for any range.
- Drop proof.
- RS232 PC interface, photo couple isolated circuit.
- When apply the optional software, then the meter can be used as data logging, data recorder & other intelligent applications.

### Continuity Beeper

A continuity test beeper is standard, when checking short or open circuit, it is not necessary to look at the meter. The beeper sounds if continuity is present.

### Transistor hFE Measurement

0 - 1000 hFE values of either p.n.p. or n.p.n. transistor.  
(Test condition: base dc current approx. 10 uA, VCE: approx. 2.8 V).

### RS-232 Output

Isolated (photo couple) RS-232 serial data output, 9600 baud rate.

Model	DM-9680 KITS
Display	18 mm (0.7") LCD, 3 1/2 digits.
Measurement & Function	DCV, ACV, DCA, ACA, ohms, hFE, Continuity Beeper.
Polarity	Automatic Switching, '-' indicates negative polarity.
Zero Adj.	Automatic
Over-input	Display shows '1' or '-1'.
Sampling Time	Approx. 0.4 second.
RS-232 Output	Isolated (photo couple) RS-232 serial data output, 9600 baud rate.
Operating Humidity	Less than 80% R.H.
Operating Temp.	0°C to 50°C (32°F to 122°F)
Power Supply	006P DC 9V battery (heavy duty).
Power Current	Approx. DC 7 mA.
Weight	322 g/0.71 LB.
Dimension	204 x 90 x 36 mm (7.3 x 3.4 x 1.5 inch).
Accessories Included	* Instruction manual: 1PC * Hard Carrying case, CA-06 * 0.5 Amp Spare Fuse: 1 PC * Red and Black Test Leads: 1 Pair * RS-232 cable: UPCB-02 * Application Software: SW-U801-WIN
optional Accessories	* RS232 cable, UPCB-02 * USB cable, USB-01 * Light adapter LX-02 * Anemometer adapter, AM-402 * Tachometer adapter TA-601 * 1000 A DC/AC current adapter, CA-501 * 1000 A DC/AC current adapter, CA-502 * 2000 A DC/AC current adapter, CA-203 * Mini ACA current adapter, CA-201 * Pressure adapter, PS-403 * EMF adapter, EMF-824 * Sound adapter, SL-406 * 50 A current shunt, ST-50 * High voltage probe, HV-40 * Soft carrying case CA-03, CA-05A * Alligator test lead, TL-02S * Heavy duty alligators, AL-04 * Holster, HS-01

### Electrical Specifications (23±5°C):

#### DC Voltage

Range	Accuracy	Resolution	Input Impedance	Overload CKT. Protection
200mV	± (0.5%+1d)	100µV	10 M ohm	500V DC, 350V AC, 15 secs
2V	± (0.8%+1d)	1mV		DC 1000V AC 800 V 15 secs
20V		10mV		
200V		100mV		
1000V		1V		

#### AC Voltage, Freq. Response: 40Hz–500Hz, sine wave spec. tested on 60Hz/50Hz

Range	Accuracy	Resolution	Input Impedance	Overload CKT. Protection
200mV	± (1%+2d)	100µV	10 M ohm	500V DC, 350V AC, 15 secs
2V		1mV		DC 1000V AC 800 V 15 secs
20V		10mV		
200V		100mV		
750V		1V		

#### DC Current

Range	Accuracy	Resolution	Voltage Drop in F.S.	Overload CKT. Protection
200µA	± (1%+1d)	0.1µA	DC 200 mV	0.5 A Fuse
2mA		1µA		
20mA		10µA		
200mA		100µA		
A*		10mA		Un Fused

\* A range: 0 to 10 A – continuous operation > 10 A to 20 A – 1 min. operation max.

#### CC Current, Freq. Response: 40Hz–500Hz, sine wave spec. tested on 60Hz/50Hz

Range	Accuracy	Resolution	Voltage Drop in F.S.	Overload CKT. Protection
200µA	± (1%+1d)	0.1µA	AC 200 mV	0.5 A Fuse
2mA		1µA		
20mA		10µA		
200mA		100µA		
A*		10mA		Un Fused

\* A range: 0 to 10 A – continuous operation > 10 A to 20 A – 1 min. operation max.

#### Resistance

Range (ohm)	Accuracy	Resolution	Open CKT. Voltage	Overload CKT. Protection
200	± (1%+3d)	0.1 ohm	Approx. 3V	AC/DC 500V
2K	± (0.8%+1d)	1 ohm	Approx. 0.3V Max.	
20K		10 ohm		
200K		100 ohm		
2M		1k ohm		
20M	± (2%+2d)	10K ohm		



CM-9940

### CM-9940, mini DCA/ACA Clamp

#### Features:

- Design meet IEC 1010 CATIII 600V safety requirement.
- 4000 counts, Auto range & multi-functions.
- Measurement for ACA, DCA, ACV, DCV, Ohms, Diode, Hz, Continuity beeper.
- Water resistance for the front panel.
- Data hold.
- Wide ranges (600A, 400A) clamp on current measurement both for ACA&DCA.
- Overload protection circuit is provided for all range.
- LSI circuit provides high reliability and durability.
- Pocket & slim housing case, easy carry out. Compact & heavy duty ABS housing case and durability.

Model	CM-9940
Display	10.8 mm (0.43") LCD, 4 digits, Max. indication 5000 (frequency range).
Measurement Range	ACA, DCA, ACV, DCV, Ohms, Diode, Hz, Continuity beeper, Relative.
Polarity	Automatic Switching, " - " indicates negative polarity.
Current Sensor	Hall effect sensor.
Zero adjustment	DCA : Push bottom adjustment. Other ranges : Automatic adjustment.
Over-input	Indication of " 1 " or " -1 ".
Sampling Time	Approx. 0.35 second.
Battery	2 x 1.5V AA ( UM-3 ) batteries.
Operating Temp./Humidity	0°C to 50°C / Less than 80% RH.
Weight / Dimension	230 g/0.50 LB (including battery). / HWD : 178 x 64 x 33 mm ( 7.0 x 2.5 x 1.3 inch )
Max. Jaw Open Size	30 mm ( 1.18 inch ) Dia.
Accessories Included	Operation manual: 1 PC, Test lead (red & black): 1 PC
Optional Accessories and Adapters	Carrying case, EMF Adapter, Light Adapter, Anemometer Adapter, Pressure Adapter, Sound Adapter, Tachometer Adapter, High Voltage Probe.

### Electrical Specifications (23±5°C):

#### DC/AC Voltage

Range	Accuracy	Resolution	Overload Protection
400mV (DC only)	± (0.5%+2d)	0.1mV	AC/DC 600V
4V	DCV: ± (1%+2d) ACV: ± (1.2%+5d)	0.001V	
40V		0.01V	
400V		0.1V	
600V		1V	

#### DC/AC current (Clamp on)

Range	Accuracy	Resolution	Overload Protection
400 A ACA: 0.5 to 400A	± (2%+5d)	0.1 A	AC/DC 600A
600 A	± (2%+8d)	1 A	

Remark \* Input impedance for ACV & DCV range is 10 Mega ohm. \* ACA, ACV specification be tested on sine wave 50/60 Hz.

#### Ohms

Range	Accuracy	Resolution	Overload Protection
400 ohm	± (1%+5d)	0.1 ohm	AC / DC 400V
4 K ohm		1 ohm	
40 K ohm		10 ohm	
400 K ohm		100 ohm	
4 M ohm	± (2%+2d)	1 K ohm	
40 M ohm	± (3.5%+5d)	10 K ohm	

#### Frequency (5V)

Range	Accuracy	Resolution	Overload Protection
5 Hz	± (1%+5d)	0.001 Hz	AC / DC 1000V
50 Hz		0.01 Hz	
500 Hz		0.1 Hz	
5 KHz		1 Hz	
50 KHz		0.01 KHz	
100 KHz		0.1 KHz	

Diode	Short/non conductance, good/defect test
Continuity	If measuring resistance is less than 10 ohm, the beeper will sound .



**DM-6056, 1000A DCA/ACA Clamp Meter****Features:**

- Design meet IEC 1010 safety requirement.
- Compact & heavy duty ABS housing plastic case.
- Measure DCA & ACA on the inductive conductor.
- Wide ranges ( 1000 A, 200 A ) for ACA/DCA measurement.
- LSI circuit provides high reliability and durability.
- Multi-functions for ACA, ACV, DCV, OHMS, Diode, Continuity beeper measurement.
- LCD display allows clear readout even at high ambient light level.
- Overload protection circuit is provided for all range.

Model	DM-6056
<b>Display</b>	13 mm (0.5") LCD, 3 1/2 digits. Max. indication 1999.
<b>Measurement</b>	ACA, ACV, DCA, DCV, Resistance, Diode, Continuity, Data hold, Peak hold.
<b>Polarity</b>	Automatic Switching, "--" indicates negative polarity.
<b>Current Sensor</b>	Hall effect sensor.
<b>Zero adjustment</b>	DCA : Manual adjustment. Other ranges except the DCA range: Automatic adjustment.
<b>Over-input</b>	Indication of " 1 " or " -1 ".
<b>Sampling Time</b>	Approx. 0.4 second.
<b>Battery</b>	006P DC 9V battery (heavy duty type).
<b>Power Consumption</b>	Approx. DC 9.6 mA.
<b>Operating Temp.</b>	0°C to 50°C
<b>Operating Humidity</b>	Less than 80% RH.
<b>Weight</b>	380 g/0.85 LB (including battery).
<b>Dimension</b>	HWD : 230 x 70 x 36 mm. (9.1 x 2.8 x 1.4 inch)
<b>Max. Conductor Size</b>	32 mm (1.3 inch) Dia.
<b>Accessories Included</b>	Operation manual: 1 PC, Test lead (red & black): 1 Set, Carrying case, CA-05A: 1PC
<b>Optional Adapters</b>	Temperature Adapter, Light Adapter, Anemometer Adapter, EMF Adapter, Tachometer Adapter, RH Adapter, 50 Amp Shunt, High Voltage Probe.

**Electrical Specifications (23±5°C):****DC Voltage**

Range	Accuracy	Resolution	Overload Protection
200mV	± (0.8%+1d)	0.1mV	AC/DC 400 V
200V		0.1V	AC/DC 600 V
600V		1V	

**AC Voltage**

Range	Accuracy	Resolution	Overload Protection
200mV	± (1%+2d)	0.1mV	AC/DC 600 V
200V		0.1V	
600V		1V	

**AC/DC current**

Range	Accuracy	Resolution	Overload Protection
200 A	± (1.5%+10d)	0.1 A	AC/DC 1000 A
1000 A	± (2%+2d)	1 A	

**OHMS**

Range	Accuracy	Resolution	Overload Protection
2 k ohm	± (1%+1d)	1 ohm	AC/DC 400 V
<b>Diode</b>	Short/non conductance, good/defect test		
<b>Peak Hold</b>	Acquisition Time: Approx. 150 ms. Display Decay Rate: < 2 digits/sec. Application: Use for measuring transient signal for current.		
<b>Data Hold</b>	Available for all functions to keep the data hold on the display		



### CM-9930, 2000A DCA/ACA Clamp+DMM

#### Features:

- 2 in 1, 2000 A clamp meter + Digital multimeter.
- Meet IEC 1010 CATIII 1000V safety requirement.
- True rms reading for ACV & ACA measurement.
- 4000 counts, Auto range, multi-functions for ACA, DCA, ACV, DCV, Ohms, Capacitance, Hz, Diode, Duty cycle and continuity check.
- LSI circuit provides high reliability and durability.
- Wide ranges ( 2000A, 400 A ) clamp on current measurement both for ACA & DCA.
- 4 ranges ( 400 uA, 4000 uA, 40 mA, 400 mA ) direct current input measurement both for ACA & DCA.
- Overload protection circuit is provided for all ranges.
- Data hold, Relative key, Back light.

Model	CM-9930
Display	15 mm (0.6") LCD, 4 digits, Max. indication 5000 ( frequency range ).
Measurement Range	ACA, DCA, ACV, DCV, Ohms, Diode, Hz, Capacitance, Duty cycle, Continuity beeper.
Polarity	Automatic Switching, "--" indicates negative polarity.
Current Sensor	Hall effect sensor.
Zero adjustment	DCA : Push bottom adjustment. Other ranges : Automatic adjustment.
Over-input	Indication of " OL " or " -OL ".
Sampling Time	Approx. 0.35 second.
Battery	DC 9V battery, heavy duty or Alkaline type, 006P, MN1604 ( PP3) or equivalent.
Power Consumption	Approx. DC 5 mA.
Operating Temp.	0°C to 50°C
Operating Humidity	Less than 80% RH.
Weight	380 g/0.85 LB (including battery).
Dimension	HWD : 255 x 73 x 38 mm. (10 x 2.9 x 1.5 inch)
Max. Jaw Open Size	51 mm ( 2.1 inch ) Dia.
Accessories Included	Operation manual: 1 PC, Test lead ( red & black): 1 Set, Fuse (500mA, 5mm dia. x 20mm): 1 PC
Optional Accessories & Adapters	Carrying case, EMF Adapter, Light Adapter, Anemometer Adapter, Pressure Adapter, Sound Adapter, Tachometer Adapter, High Voltage Probe.

### Electrical Specifications (23±5°C):

#### DC/AC Voltage

Range	Accuracy	Resolution	Overload Protection
400mV (DC only)	± (0.5%+2d)	0.1mV	AC/DC 1000V
4V	DCV: ± (1%+2d) ACV: ± (1.2%+5d)	0.001V	
40V		0.01V	
400V		0.1V	
1000V		1V	

**DC/AC current (Direct input)**

Range	Accuracy	Resolution	Overload Protection
400 $\mu$ A	$\pm (1.2\%+5d)$	0.1 $\mu$ A	AC/DC 500 mA (Fuse)
4000 $\mu$ A		1 $\mu$ A	
40 mA		0.01 mA	
400 mA		0.1 mA	

**DC/AC current (Clamp on)**

Range	Accuracy	Resolution	Overload Protection
400 A	$\pm (2\%+5d)$	0.1 A	AC/DC 2000A/1000V
2000 A	$\pm (2\%+8d)$	1 A	

Remark \* True rms measurement both for ACV, ACA function. \* Input impedance for ACV & DCV range is 10 Mega ohm.  
\* ACA, ACV frequency response is from 45 to 1 KHz. \* ACA, ACV specification be tested on sine wave 50/60 Hz.

**Ohms**

Range	Accuracy	Resolution	Overload Protection
400 ohm	$\pm (1\%+5d)$	0.1 ohm	AC / DC 400V
4 K ohm		1 ohm	
40 K ohm		10 ohm	
400 K ohm		100 ohm	
4 M ohm	$\pm (2\%+2d)$	1 K ohm	
40 M ohm	$\pm (3.5\%+5d)$	10 K ohm	

**Capacitance**

Range	Accuracy	Resolution	Overload Protection
50 nF	$\pm (3\%+5d)$ * See Remark	10 pF	AC / DC 400V
500 nF		100 pF	
5 $\mu$ F		0.001 $\mu$ F	
50 $\mu$ F		0.01 $\mu$ F	

**Frequency (>5V)**

Range	Accuracy	Resolution	Overload Protection
5 Hz	$\pm (1\%+5d)$	0.001 Hz	AC / DC 1000V
50 Hz		0.01 Hz	
500 Hz		0.1 Hz	
5 KHz		1 Hz	
50 KHz		0.01 KHz	
100 KHz		0.1 KHz	

**Duty cycle**

Range	Accuracy	Resolution	Overload Protection
1% to 99%	$\pm (1\%+5d)$	0.1%	AC / DC 1000V

<b>Diode</b>	Short/non conductance, good/defect test
<b>Continuity</b>	If measuring resistance is less than 10 ohm, the beeper will sound .



### DW-6093, 3 phase power analyzer, 3 phase/4 wire, 3 phase/3 wire, RS232/USB 1 phase/2 wire, 1 phase/3 wire, SD card data recorder

- Analysis for 3 phase multi-power system, 1P/2W, 1P/3W, 3P/3W, 3P/4W.
- Voltage & Current are the True RMS value.
- True Power (KW, MW, GW) measurement.
- Apparent Power ( KVA, MVA, GVA) measurement.
- Reactive Power ( KVAR, MVAR, GVAR) measurement.
- Watt-Hour ( WH, SH, QH, PFH ).
- Power Factor (PF), Phase Angle( $\Phi$ ).
- Voltage measurement range: 10 to 600 ACV.
- Current probe input signal voltage (ACV): 200mV/300mV/500mV/1 V/2 V/3 V. Current probe input current range (ACA): 20A/200A/2000A(1200A)/30A/300A/3000A.
- Meter can cooperate the universal current probe.
- Programmable CT ratio (1 to 600) and PT ratio (1 to 1000).
- ACV input impedance is 10 Mega ohms.
- Safety Standard: IEC 1010, CAT III 600V.
- Built-in clock & Calendar, real time data record with SD memory card, sampling time set from 2 to 7200 seconds. Just slot in the SD card into the computer, it can down load the all the measured value with the time information (year/month/data/hour/minute/second) to the Excel directly, then user can make the further data analysis by themselves.
- Complete set with 4 PCs Test Leads, 4 PCs Alligator clips, 3 PCs Clamp Probe, AC to DC 9V adapter, 2 G SD memory card and Carrying bag.
- Computer data output, can cooperate with USB Cable/USB-01 RS232 cable/UPCB-02 and Data Acquisition software, SW-U811-WIN.

Model	DW-6093
Circuit	Custom one-chip of microprocessor LSI circuit.
Display	LCD size : 81.4 X 61 mm (3.2 X 2.4 inch) * Dot Matrix LCD (320 X 240 pixels) with back light.
Measurement	* ACV * ACA * AC WATT (True Power) AC WATT(Apparent Power) AC WATT(Reactive Power) * Power factor * Phase angle * Frequency
Wire connections	1P/2W, 1P/3W, 3P/3W, 3P/4W.
Voltage ranges	10 ACV to 600 ACV, auto range.
Current probe input signal & range	* Current probe input signal voltage (ACV): 200mV/300mV/500mV/1V/2V/3V. * Current probe input current range (ACA): 20 A/200A/2000A (1200A)/30A/300A/3000A * Meter can cooperate the universal current probe.
Safety standard	IEC1010 CAT III 600 V.
ACV input impedance	10 Mega ohms.
Range select	ACV: Auto range; ACA: Manual range
Clamp frequency response	40 Hz to 1 KHz.
Spec. tested frequency	45 to 65 Hz.
Over load protection	ACV: 720 ACV rms; ACA: 1300 ACA with clamp probe * For the Clamp ,CP-1201
Over Indicator	* LCD display show "OL". * The data save into the SD card will show "9999" or "999" (overleap the decimal point).
Under Indicator	* LCD display show "UR". * The data save into the SD card will show "9999" or "999" (overleap the decimal point).
Data Hold / Data Record	Freeze the display reading. / SD Card Record.
Sampling Time	Approx. 1 second.
Power ON/OFF	Manual OFF by push button.
Real time datalogger	* Real time datalogger, saved the data into SD memory card & down load the all the measured value with the time information (year/month/data/hour/minute/second) down load to the Excel * Integration time for datalogger: 2 seconds to 7200 seconds, the during of setting step are 2 sec.
Data Output USB/RS232 * Computer interface	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.
Operating Temperature	0 to 50°C (32 to 122°F).
Operating Humidity	Less than 80% R.H.
Power Supply	* DC 1.5V, AA (UM-3) BatteryX8 PCs (Alkaline or heavy-duty battery) * AC to DC 9V power adapter
Power Consumption	* Meter: 300 DCmA. * Clamp: 34 DCmA.
Clamp max. conductor Size	50 mm (2.0 inch) Dia. * For the Clamp ,CP-1201
Weight	* Meter: 948g (includes batteries) * Clamp (included cable): 467g
Dimension	Meter: 225 X 125 X 64 mm (8.86 X 4.92 X 2.52 inch)
	Clamp : 210 X 64 X 33mm ( 8.3 X 2.5 X 1.3 inch )
	Clamp Jaw : 86 mm (3.4 inch)- outside
Accessories Included	* Instruction manual: 1PC * Test Leads (TL88-4AT): 1 Set (4 PCs) * Alligator clips (TL88-4AC): 1 Set (4 PCs) * Clamp Probe (CP-1201): 3 PCs * AC to DC 9V adapter: 1 PC * SD card (2G): 1 PC * Carrying bag: 1 PC
Optional Accessories	* 2000 Amp current probe, CP-2000 * 200 Amp current probe, CP-200 * Flexible 3000 Amp current probe, CP-3000 * USB Cable , USB-01 * RS232 cable, UPCB-02 * Data Acquisition software, SW-U811

## Electrical Specifications (23±5°C):

### ACV

Range	Resolution	Accuracy
10.0V to 600.0V * Phase to neutral line	0.1V	± (0.5%+0.5V)
10.0V to 600.0V * Phase to phase		

### ACA

Range	Resolution	Accuracy
20A	0.001A, < 10 A	± (0.5%+0.1A)
	0.01A, ≥ 10 A	
200A	0.01A, < 100 A	± (0.5%+0.5A)
	0.1A, ≥ 100 A	
1200A	0.1A, < 1000 A	± (0.5%+5A)
	1A, ≥ 1000 A	

### Power factor

Range	Resolution	Accuracy
0.00 to 1.00	0.01	±0.04

**Remark:**  
 \* PFH: Long term average power factor (WH/SH)  
 \* PFΣ:  
 For 3Φ 4W, 3Φ 3W For 1Φ 3W  
 $PF\Sigma = (PF1 + PF2 + PF3) / 3$   $PF\Sigma = (PF1 + PF2) / 2$

### Φ (Phase angle)

Range	Resolution	Accuracy
-180° to 180°	0.1°	± 1° * ACOS(PF)

### Frequency

Range	Resolution	Accuracy
45 to 65 Hz	0.1 Hz	0.1 Hz

### Active (Real) Power Active (Real) Power

Range	Resolution	Accuracy
0.000 to 9.999 KW	*0.001/0.01/0.1 KW	± (1%+0.008 KW)
10.00 to 99.99 KW	*0.01/0.1 KW	± (1%+0.08 KW)
100.0 to 999.9 KW	0.1 KW	± (1%+0.8 KW)
1.000 to 9.999 MW	0.001 MW	± (1%+0.008 MW)

### Apparent Power

Range	Resolution	Accuracy
0.000 to 9.999 KVA	*0.001/0.01/0.1 KVA	± (1%+0.008 KVA)
10.00 to 99.99 KVA	*0.01/0.1 KVA	± (1%+0.08 KVA)
100.0 to 999.9 KVA	0.1 KVA	± (1%+0.8 KVA)
1.000 to 9.999 MVA	0.001 MVA	± (1%+0.008 MVA)

### Reactive Power

Range	Resolution	Accuracy
0.000 to 9.999 KVAR	*0.001/0.01/0.1 KVAR	± (1%+0.008 KVAR)
10.00 to 99.99 KVAR	*0.01/0.1 KVAR	± (1%+0.08 KVAR)
100.0 to 999.9 KVAR	0.1 KVAR	± (1%+0.8 KVAR)
1.000 to 9.999 MVAR	0.001 MVAR	± (1%+0.008 MVAR)

### Watt Hour (Active Power Hour): WH

Range	Resolution	Accuracy
0.000 to 9.999 KWH	0.001 KWH	± (2%+0.008 KWH)
10.00 to 99.99 KWH	0.01 KWH	± (2%+0.08 KWH)
100.0 to 999.9 KWH	0.1 KWH	± (2%+0.8 KWH)
1.000 to 9.999 MWH	0.001 MWH	± (2%+0.008 MWH)

### VA Hour (Apparent Power Hour): SH

Range	Resolution	Accuracy
0.000 to 9.999 KVAH	0.001 KVAH	± (2%+0.008 KVAH)
10.00 to 99.99 KVAH	0.01 KVAH	± (2%+0.08 KVAH)
100.0 to 999.9 KVAH	0.1 KVAH	± (2%+0.8 KVAH)
1.000 to 9.999 MVAH	0.001 MVAH	± (2%+0.008 MVAH)

### VAR Hour (Reactive Power Hour): QH

Range	Resolution	Accuracy
0.000 to 9.999 KVARH	0.001 KVARH	± (2%+0.008 KVARH)
10.00 to 99.99 KVARH	0.01 KVARH	± (2%+0.08 KVARH)
100.0 to 999.9 KVARH	0.1 KVARH	± (2%+0.8 KVARH)
1.000 to 9.999 MVARH	0.001 MVARH	± (2%+0.008 MVARH)



### PDS5022, Portable Digital Storage Oscilloscope

#### Application:

- Electronic circuit test and debug
- In house Design
- Education and Training
- Service and Maintenance

Model	PDS5022	
Bandwidth	25MHz	
Sample Rate (Real time)	100MS/s	
Rise time	≤14ns	
Display	7.8 inch colored LCD, STN	
Channel	Dual channels + external trigger	
Sampling mode	Normal sample, Peak detect and Average	
Record length	Max. 5000 per channel	
Horizontal scale (s/div)	5ns/div ~ 100s/div	
Vertical sensitivity	5mV ~ 5V/div (at BNC input)	
DC Gain Accuracy	±5%	
Max. input voltage	300V (PK-PK) (DC + AC PK-PK)	
Input impedance	1MΩ±2% in parallel with 20pF±5pF	
Input coupling	AC, DC	
Trigger Mode	Edge, Video	
Vertical resolution (A/D)	8 bits (2CH simultaneously)	
Sampling rate / relay time accuracy	±100ppm	
Interval (ΔT) accuracy (DC~100MHz)	Single: ±(1 interval time+100ppm×reading+0.6ns) Average>16: ±(1 interval time +100ppm×reading+0.4ns)	
Waveform storage	4 waveforms	
Automatic measurement	Peak-to-Peak, Average, Root mean square, Frequency, and Cycle	
Waveform math	+, -, Invert, FFT	
Lissajou's figure	Bandwidth	25MHz
	Phase difference	±3 degrees
Interface	USB	
AC	100-240 VACRMS, 50Hz, CAT II	
Dimension	350mm(L)*157mm(H)*103mm(W)	
Weight	1KG	



DSO-1060

### DSO-1000 Series, 500MSa/s, 200MHz, 2CH, 6000 Count DMM Handheld Oscilloscope

#### Features:

- 200/60MHz bandwidth with 2 channels.
- 500MSa/s, 250MSa/s real time sampling rate.
- 50GSa/s equivalent time sampling rate.
- 6,000 count DMM resolution with AC at 600V/1.0A and DC at 800V/10A.
- Large 5.7 inch TFT color LCD display.
- Multi-language support.
- 1000 waveforms save and record.
- Labview\VB\VC second design instance.

Model		DSO-1060	DSO-1200
Horizontal	Channel	2	2
	Bandwidth	60MHz	200MHz
	Rise Time	32k at single channel, 16k at double channels	
	Memory Depth (Sample Points)	≤ 5.8ns	≤ 1.7ns
	Real-time Sampling Rate	250MSa/s	500MSa/s
	Equivalent Sampling Rate	Equivalent max. sampling rate is 50GSa/s	
	Time Base Range	5ns/div-1000s/div	
Time Base Precision	±50ppm		
Vertical	Input Impedance	Resistance: 1MΩ ; Capacitance: 15 pF	
	Input Sensitivity	10mV/div to 5V/div	
	Input Coupling	AC, DC and GND (ground level indicator)	
	Vertical Resolution	8 bits	
	Maximum Input	400V (DC+AC Peak)	
Trigger	Source	CH1, CH2	
	Mode	Edge, Pulse Width, Alternative, Video	
	Edge trigger	Trigger on the rising or falling edge	
	Pulse Width trigger	Trigger on an NTSC, PAL or SECAM standard video signal	
	Video Trigger	Line Range: 1-525 (NTSC), 1-625 (PAL/SECAM) Trigger (when >,<,-,≠) on a positive or negative slope Set Time: 20ns-10s	
X-Y Mode	Alternative trigger	Internal trigger on edge, pulse width, video or slope	
	X-Axis Input	Channel 1	
	Y-Axis Input	Channel 2	
Measurement	Phrase Shift	Max. 3 degree	
	Voltage Measurement	Vpp, Vamp, Vmax, Vmin, Vtop, Vmid, Vbase, Vavg, Vrms, Vcrms, Preshoot, Overshoot	
	Time Measurement	Frequency, Period, Rise Time, Fall Time, Positive Width, Negative Width, Duty Cycle	
	Delay Measurement	Delay time from CH1 rising edge to CH2 rising edge Delay time from CH1 falling edge to CH2 falling edge	
	Cursors Measurement	Manual, Track, Auto Measure Modes	
Meter Mode	Waveform Signal Process	CH1+/- CH2, CH1xCH2, CH1/CH2, FFT, Invert	
	Storage	15 Waveforms and Setups	
	Maximum Resolution	6,000 Counts	
	DMM Testing Modes	Voltage, Current, Resistance, Capacitance, Diode & Continuity	
	Maximum Input Voltage	AC: 600V, DC: 800V	
Display	Maximum Input Current	AC: 10A, DC: 10A	
	Input Impedance	10 MΩ	
Interface	Type	5.7 inch with LED backlight display	
	Display Resolution	240 (vertical) x 320 (horizontal) dots	
Power Source	USB	USB host / device 2.0 full speed supported	
	Optional	RS232, LAN	
General Feature	Line Voltage Range	AC 100V ~ 240V, 50Hz ~ 60Hz	
	Battery Power (Installed)	6 hours (Li-ion Battery)	
General Feature	Dimension	Length: 245mm Width: 163mm Height: 52mm	
	Weight	1.3KGS (exclusive of packing and accessories)	
	Accessories	2pcs probes, 2pcs multimeter probes, 1pc power cable, 1pc USB cable	
	GND Reference	Oscilloscope and Multimeter Independence	



### MO-2013, high precision milliohm meter

- 4 terminal devices for accurate measurement of very low resistance.
- Ideal for measuring the resistance of components precisely.
- Ideal for testing protective conductors, lightning conductors & welded points.
- High/Good/Low set-function for input quality control.
- Build in buzzer sound (GOOD STATUS) to assist the Q.C. judgment.
- Especial "CALCULATE" function to measure cable/wire length.
- Wide measuring range, 0.01 m ohm - 20K ohm, 7 ranges.
- RS232/USB computer interface.
- 26.7 mm large size and back-light LCD display, easy read-out.
- LSI circuit provides high accuracy, reliability and durability.
- Built-in over input protection.
- Durable bench type housing plastic case stand.

Model	MO-2013
<b>Test Range (Test Current)</b>	20 m ohm (1A DC), 200m ohm (1A DC), 2 ohm (100mA DC), 20 ohm (10mA DC), 200 ohm (1mA DC), 2K ohm (100uA DC), 20K ohm (10uA DC)
<b>Warning Setup</b>	* Warning LED Indicator * Buzzer
<b>Operating Temp.</b>	0 to 50°C (32 to 122°F).
<b>Operating Humidity</b>	Less than 80 % R.H.
<b>Power Supply</b>	AC 110V ± 15%, 50/60 Hz or AC 230V ± 15%, 50/60 Hz.
<b>Power Consumption</b>	AC 110V: Approx. 33 mA, AC 230V: Approx. 15 mA
<b>Fuse for Power Supply</b>	* 500 mA/250 V * Size: 5 X 20 mm dia.
<b>Data Output</b>	RS 232/USB PC serial interface. *Connect the optional RS232 cable UPCB-02 will get the RS232 plug. *Connect the optional USB cable USB-01 will get the USB plug.
<b>Dimension</b>	280 x 210 x 90 mm (11.0 x 8.3 x 3.5 inch)
<b>Weight</b>	Approx. 2.04 Kg (4.49 LB).
<b>Standard Accessories</b>	* Power cord: 1 PC. * Instruction manual: 1 PC. * 4 wire with 2 Kelvin clips: 1 pair
<b>Optional Accessories</b>	*RS232 cable, UPCB-02 * USB cable, USB-01 * Data Acquisition software, SW-U801-WIN



### FG-2003, Function Generator

- The FG-2003 is a deluxe function generator combined with a 5 digit, high resolution 60 MHz counter.
- The FG-2003 is a deluxe function generator combined with a 5 digit, high resolution 60 MHz counter.
- Function Generator: 6 waveforms selected by rotary witch instead of push button, to prevent miss-touch or bad connection. Maximum output 20Vp-p(No-load), and Minimum output 0.1Vp-p (No-load).
- Pulse Generator: FG-2003 provides positive pulse and negative pulse output, Maximum output 20Vp-p (No-load). Frequency is displayed by LEDs, pulse width is from 0.4sec to 100ns. This will meet most of your audio, Video and other basic electronic application requirements.
- Sweep Generator: FG-2003 provides linear

sweep or log sweep selection switch to select the sweep mode. Maximum sweep width is 1:100 and sweep speed is from 5sec to 10ms. The FG-2003 also provides VCF input and synchronous Output Function.

- The FG-2003 has a 5 digit micro controlled counter. FG-2003 features include auto ranging, auto gate time, high resolution 0.001Hz, high input impedance 1MΩ, and high bandwidth 0.2Hz~60MHz. FG-2003 also provides triggering features such as an adjustable trigger ±2.5V with LED indicator, AC/DC selector, 100KHz filter, and input attenuator input x 20 for 300Vrms high voltage signal. The unit will also display the frequency of the signal produced by the function generator.

Model	FG-2003
<b>Generator</b>	
<b>Frequency</b>	0.5 Hz ~ 3 MHz with 5 digit LED display, Max. resolution 0.001 Hz in 6 steps.
<b>Waveform</b>	Sine, Square, Triangle, Ramp, Positive Pulse and Negative Pulse; 6 waveforms total.
<b>Stability</b>	0.1 % ~ 15 minutes after power-on.
<b>Counter</b>	
<b>Display</b>	5 digits 0.36" red LED.
<b>Max. Resolution</b>	0.001 Hz.
<b>Display Unit</b>	Hz / KHz Automatically controlled by CPU.
<b>Common Specification</b>	
<b>Limits of Operation</b>	0 ~ 40 °C, 10 ~ 80 %R.H.
<b>Storage Environment</b>	-20 ~ 70 °C, 0 ~ 90 %R.H.
<b>Power Consumption</b>	25W.
<b>Power Source</b>	AC 115 V (±10%) 50/60 Hz, FUSE:600 mA, AC 230 V (±10%) 50/60 Hz, FUSE:300 mA
<b>Ventilation</b>	DC 12 V / 100 mA Fan.
<b>Dimension</b>	275 x 90 x 300 mm.
<b>Weight</b>	2.5 Kg / 5.5 LB.
<b>Standard Accessories</b>	* Power cord: 1 PC. * operation manual: 1 PC.
<b>Optional Accessories</b>	AT-20: Telescoping RF pick-up antenna with BNC connector.
	PB-21: Direct cable with BNC connector & alligator clip pairs. (Be used only for the measuring frequency ≥ 500 MHz)
	BB-22: Direct cable with double BNC connector.
	NN-23: Direct cable with double N coaxial connector.
	NB-24: BNC to N coaxial connector adapter.



**UV-26, Dual-Wavelength UV Transilluminator, 302nm/365nm**

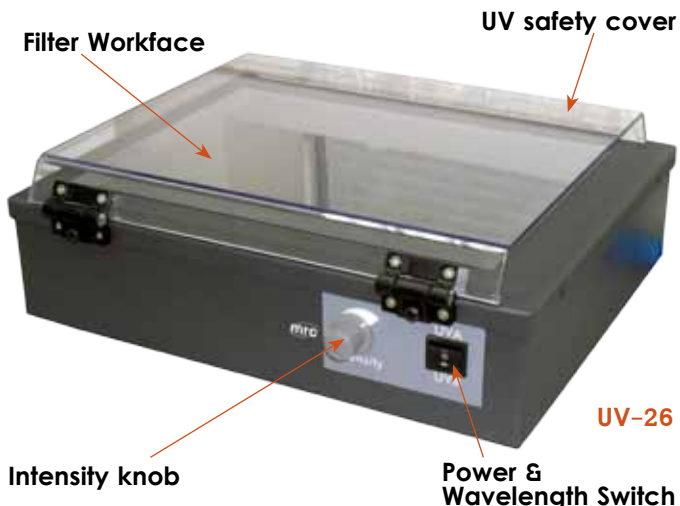
UV Transilluminators are designed for viewing DNA/RNA in agarose gels stained with ethidium bromide (EB) or other dyes.

Transparent hinged cover, with UV-safety cover to protect users from exposure to hazardous UV radiation, is mounted by slip-hinges for easily adjusting to user's visual angle.

UV-26 Dual-wavelength UV transilluminator provides a uniform & intense source of 302nm & 365nm ultraviolet lights to back-illuminate transparent fluorescent materials.

Nucleic acids stained with fluorescent dyes such as ethidium bromide and acridine orange can be detected under UV illumination.

The filter surface is 210 x 260 mm. The light intensity level can be set from 0%–100% continuously. Either transilluminator can be converted from 302/365nm to 254nm by replacing the UV lamps as described in the Care and maintenance section.



Model	UV-26
<b>UV Lamps</b>	5-302nm lamp(8W) & 4x365 lamp(8W)
<b>Intensity</b>	Variable intensity 5% ~ 100%
<b>Filter Size(mm)</b>	L260xW210
<b>UV Safety Cover Size(mm)</b>	L320xW280
<b>Dimensions(mm)</b>	L340xW290xH85
<b>Weight</b>	5kg
<b>Power</b>	220V/50Hz



**GED-3121/GED-4535, Midi Gel Dryer**

The microprocessor of Midi Gel Dryer controls temperature from ambient +5°C to 90°C with timer from 0 to 999 mins to heat gels from base plate and connect with a vacuum pump to remove the moisture to dry gels homogeneously. The surrounding groove design and the optimal sealing silicon rubber with mask ensure the optimal sealing when connecting with a vacuum pump.

**Features:**

- Drying Area: 210x310mm (LxW), 350x450mm (LxW)
- Microprocessor for temperature control
- User temperature calibration
- Timer with alarm
- 2 digital LED display.

**Specifications:**

Model	GED-3121	GED-4535
<b>Drying Area (mm)</b>	L210xW310	L350xW450
<b>Display</b>	Two of 4 digital LED	
<b>Control</b>	Digital Microprocessor controller	
<b>Temperature Control Range</b>	ambient to 90°C	
<b>Temperature Increment</b>	0.1°C	
<b>Temperature Uniformity at 37°C</b>	±0.2°C	
<b>Temperature Calibration</b>	Yes	
<b>Timer</b>	0~999 mins	
<b>Operating Temperature</b>	ambient to 40°C	
<b>Weight</b>	approx. 9.0kg	approx. 15.0kg



**PWR-3040**

### PWR-3040, 300V/400mA Power Supply

Combining small size and versatility, the newly redesigned Mini PWR-3040 power supply is an ideal choice for any researcher. Capable of providing constant voltage or constant current in 1V or 1mA steps, the unit is perfectly suited to run both vertical polyacrylamide or horizontal agarose gel electrophoresis experiments. Continuous or timed operation are easily performed using the simple and user-friendly interface. The PWR-3040 features 2 electrode pairs, allowing for 2 gels to be run simultaneously, saving both time and valuable bench space. With a universal voltage rating, the PWR-3040 is also designed and constructed to the most rigorous safety standards.

Packages including single or dual horizontal electrophoresis systems and mini vertical electrophoresis systems are excellent choices for educational or personal use.

#### Features:

- New housing and exterior design
- Constant voltage or constant current operation
- 1V step voltage selection; 1mA step current selection
- 400mA maximum current
- 60W maximum power
- Two pairs of outlet terminals
- Timer with alarm function
- Safety device
- Compact size and lightweight
- Competitive pricing choice
- Packages with midi sized horizontal electrophoresis systems and vertical electrophoresis systems.



**PWR-3070**

### PWR-3070, 300V/700mA Power Supply

The MRC PWR-3070 power supplies are designed to meet most electrophoresis needs, running horizontal & vertical electrophoresis, and two-dimensional electrophoresis, or SDS-PAGE applications. It is recognized as the most powerful unit in its market class, capable of running 4 systems simultaneously. Its design provides a compact and modern stackable case. Microprocessor control offers an easy user interface. The user has control of constant voltage output as well as constant current output. Pause/resume functions and a timer with alarm allow run capability during timed or continuous operation. The safety devices include no load detection, leakage detection, sudden load change detection, over temperature protection, & over load detection.

#### Features:

- 300V maximum voltage
- 700mA maximum current
- 150W maximum power
- Four pairs of outlet terminals
- Timer with alarm function
- Constant voltage or constant current operation
- Advanced safety device design
- Compact size
- Stackable case
- Wide applications for DNA, RNA and protein electrophoresis.



Model	PWR-3040	PWR-3070
<b>Max. voltage</b>	10 – 300V / 1V	2 – 300V / 1V
<b>Max. current</b>	10 – 400mA / 1mA	1 – 700mA/1mA
<b>Max. watt</b>	60W	150W
<b>Output type</b>	Constant voltage or constant current	
<b>Control</b>	Microprocessor controller	
<b>Terminator pairs</b>	2 Pairs	4 Pairs
<b>Timers</b>	1 ~ 999 mins with alarm, continuous	
<b>Pause Function</b>	-	Yes
<b>Safety device</b>	No load detection, Leakage detection, Sudden load change detection, Over temperature protection, Overload detection, Shrouded plug and sockets	
<b>Crossover</b>	Yes	
<b>Operation temperature</b>	Ambient to 40°C	
<b>Unit dimension</b>	190 x 305 x 95 mm (WxLxH)	
<b>Construction material</b>	Flame retardant ABS plates and aluminum	
<b>Weight</b>	2.5kg	
<b>Rated voltage</b>	100 ~ 240V	
<b>Stackable</b>		Yes
<b>Applications</b>	Sufficient for mild sized horizontal electrophoresis systems and vertical electrophoresis systems	capable of running 4 systems simultaneously



**PWR-5080**

**PWR-5080, 500V/800mA Power Supply**

The PWR-5080 power supply is a microprocessor controlled power supply to that covers the broadest range of applications. It offers constant voltage, constant current or constant watt output. Pause/resume run capability during timed or continuous operation is allowed. PWR-5080 is a fully programmable model, offering up to 6 multi-step settings and saving up to 30 programs, and capable for running 4 electrophoresis systems simultaneously. Its design provides a compact and modern stackable case, and a 2.6" LCD screen, showing all the running / setting conditions. Safety devices include no load detection, leakage detection, sudden load change detection, over temperature protection, and over load detection.

**Features:**

- 500V maximum voltage • 800mA maximum current • 300W maximum power • Four pairs of outlet terminals • Timer with alarm function • Advanced safety device design • Compact size • Stackable case • Wide applications for DNA, RNA and protein electrophoresis.



**PWR-3030**

**PWR-3030, 300V/3000mA Power Supply**

The PWR-3030 power supply is the high current model. In addition to running standard horizontal agarose and vertical polyacrylamide gels, the PWR-3030 power supply easily handles all your blotting applications.

Its microprocessor control offers constant voltage, constant current or constant wattage and pause/resume run capability during timed or continuous operation.

PWR-3030 is fully programmable, offering up to 6 multi-step settings and

saving up to 30 programs, and capable of running 4 cells simultaneously. Its design provides a compact and modern stackable case, and a 2.6" LCD screen, which displays all the running / setting conditions. Safety devices include no load detection, leakage detection, sudden load change, over temperature protection, and over load detection.

**Features:**

- 300V maximum voltage • 3000mA maximum current • 300W maximum power • Four pairs of outlet terminals • Timer with alarm function • Constant voltage or constant current operation • Advanced safety device design • Compact size • Stackable case • Wide applications for DNA, RNA and protein electrophoresis.



Model	PWR-5080	PWR-3030
Display	2.6"LCD	
Max. voltage	5 - 500V / 1V	5 - 300V / 1V
Max. current	1 - 800mA / 1mA	10 - 3000mA/10mA
Max. watt	300W/1W	300W/1W
Output type	Voltage or current or power	Constant voltage or constant current
Control	Microprocessor controller	
Program Storage	30 programmed files	
Program Multi-Step	Up to 5 steps	Up to 6 steps
Terminator pairs	4 Pairs	
Timers	Constant mode:1~9999 minutes with alarm, continuous Programmable mode: 1~999 minutes with alarm, continuous	
Pause Function	Yes	
Safety device	No load detection, Leakage detection, Sudden load change detection, Over temperature protection, Overload detection, Shrouded plug and sockets	
Crossover	Yes	
Operation temperature	4°C to 40°C	
Unit dimension	190 x 305 x 95mm (WxLxH)	
Construction material	Flame retardant ABS plates and aluminum	
Weight	2.5kg	
Rated voltage	100 ~ 240V	
Stackable	Yes	

## MJ-105-S, Mini Horizontal Gel Electrophoresis System

The MJ-105-S horizontal cell offers many advantages for nucleic acid separation. Agarose gels are convenient to cast and samples are easy to load with this recognizable mini horizontal cell. Its molded design prevents cracks and leakages and the sturdy PC provides a 130°C temperature capacity. The safety interlock cover is designed to prevent electrical hazards during electrophoresis. It is ideal for several applications, including Northern and Southern blotting, Cosmid library restriction analysis, STS screening, microsatellite analysis, PCR fragment analysis, RFLP analysis, DNA finger-printing and High Throughput analysis.



MJ-105-S

### Features:

- Less Agarose consumption
- Less running buffer consumption
- Multichannel Pipette-compatible
- Single molded tank
- Two tray options available
- Two cell color options available
- Safety & Ventilation lid
- Contain 2 sets of gel maker stand
- No direct heat impact from power supply unit
- Cast 6 pcs of agarose gel in one time
- High temperature capability, 130°C
- Easy sample loading
- Great indications for gel making and running
- No tapes, clamps or springs needed for gel casting.

This product is offered as a complete system for the user to cast, and run electrophoresis, including:

- 1 x Electrophoresis Tank & Cover
- 2 x MJ-G01 (Gel Maker Stand)
- 2 x MJ-T02 (107 x 60mm Tray)
- 4 x MJ-T01 (52 x 60mm Tray)
- 2 x MJ-C01 (Double Size Comb: 8 teeth x 2 & 17 teeth, 12 teeth x 2 & 25 teeth)
- 1 x Black & Red Power Cord.

Model	MJ-105-S
Appearance	Snow tank lid
Construction	PC (Polycarbonate)
Temp. Capacity	130°C
Unit Dimension (mm)	W140xD140xH53
Gel Dimension (mm)	W52xL60 W107xL60
Max. Gel Thickness	10mm
Maximum Sample	25
Buffer Volume	200ml
Lid	Safety and ventilation
Tray	Black well-visualization strip /Migration distance index line /Agarose level, 5mm
Rapid Casting Gel	Use gel maker stand

## MT-108, Wide Mini Horizontal Gel Electrophoresis System

MT-108 Horizontal Cell offers many advantages for nucleic acid separation. Agarose gels are easy to cast and samples are easy to be loaded. MT-108's longer tray allows running bigger fragments and the better separation. Its molded design prevents cracks or leakages, and its sturdy PC provides up to 130°C temperature capacity. A safety interlock cover is designed to prevent electrical hazards during electrophoresis. It is ideal for many applications, including Northern and Southern blotting, Cosmid library restriction analysis, STS screening, Microsatellite analysis, PCR fragment analysis, RFLP analysis, DNA fingerprinting and High-throughput analysis.



MT-108

### Features:

- Less Agarose consumption
- Less running buffer consumption
- Multichannel Pipette-compatible
- Single molded tank
- Two tray options available
- Safety & Ventilation lid
- Cast 3 pcs of agarose gel in one time
- No direct heat impact from power supply unit
- High temperature capability, 130°C
- Easy sample loading
- Great indications for gel making and running
- No tapes, clamps or springs needed for gel casting.

This product is offered as a complete system for the user to cast, and run electrophoresis, including:

- 1 x Electrophoresis Tank & Cover
- 1 x MT-G01 (Gel Maker Stand)
- 1 x MT-T01 (105x83mmTray)
- 2 x MT-T02 (50 x 83mm Tray)
- 1 x MJ-C01 (Double Size Comb: 8 teeth x 2 & 17 teeth, 12 teeth x 2 & 25 teeth)
- 1 x MT-C03 (multiple Pipette compatible 23 teeth, Prep 2 & Marker 2, Prep 2 & Marker 2 on one side; 6 teeth x 2 for mini gel & 13 teeth for midi gel on the other side)
- 1 x Black & Red Power Cord.

Model	MT-108
Construction	PC (Polycarbonate)
Temperature Capacity	130°C
Unit Dimension (mm)	W136xD188xH58
Gel Dimension (mm)	W105xL83 / W50xL83
Max. Gel Thickness	10mm
Maximum Sample	25
Buffer Volume	400ml
Lid	Safety and ventilation
Tray	Black well-visualization strip Migration distance index line
Rapid Casting Gel	Use gel maker stand

**ME-10-7-10, Horizontal Gel Electrophoresis System**



ME-10-7-10 has been designed for routine horizontal gel electrophoresis with gel tray options of 10 x 7cm and 10 x 10cm. Extending only the width of this unit allows more samples to be resolved per gel. A maximum of 100 samples per gel can be resolved making this unit ideal for those routinely checking medium numbers of samples over short to medium gel run lengths.

**Features:**

- Low buffer consumption.
- Single molded tank.
- Two tray options available.
- Easy sample loading.
- Great indications for gel making and running.
- No tapes, clamps or springs needed.

Model	ME-10-7-10
Unit dimension (WxLxH)	220x125x90mm
Gel dimension (WxL)	100x70mm
Maximum sample	50 for 100x70mm tray, 100 for 100x100mm tray
Buffer volume	300ml
Construction	Injection molded construction durable, leak proof environment for complete safety & long life
Cassette type electrodes	Inexpensive, easy to replace, made of 99.99% corrosion resistant pure platinum
Electrical safety	Lid can be located in one way only, on removal- power is disconnected from buffer chamber
Rapid casting gel	Use casting dams

**ME-15-7-10-15, Horizontal Gel Electrophoresis System**

offers a wide degree of versatility. Three tray options are available, 15 x 7cm, 15 x 10 cm and 15 x 15cm allowing the choice of one, two or all three gel length options at the time of purchase. Further purchases of additional accessories are no longer required. Maximizing comb and tray options allow up to 210 samples to be resolved per gel. The 15 cm total run length allows restriction fragment or other close MW sample bands to be easily separated and identified.



Speed loading is accomplished using 10, 14, 16, 18, 28 and 30 sample multi-channel Pipette compatible combs. In addition, the packages with Minis 300V power supply Series are ideally offered to individuals in the laboratory at a competitive and acceptable pricing to avoid time waiting for those basic instruments and to accelerate the experimental progress.

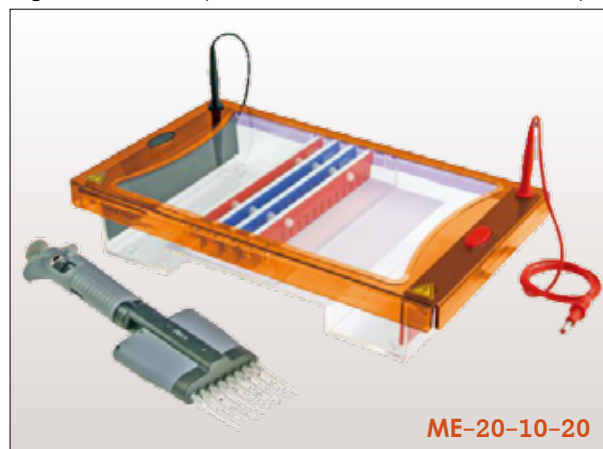
**Features:**

- Low buffer consumption.
- Single molded tank.
- Three tray options available.
- Multi-channel Pipette compatibility.
- Great indications for gel making and running.
- No tapes, clamps or springs needed.

Model	ME-15-7-10-15
Unit dimension (WxLxH)	265x175x90mm
Gel dimension (WxL)	150x70mm, 150x100mm, 150x150mm
Maximum sample	70 for 750x70mm tray, 140 for 150x100mm tray, 210 for 150x150mm tray
Buffer volume	500ml
Construction	Injection molded construction durable, leak proof environment for complete safety and long life
Cassette type electrodes	Inexpensive, easy to replace, made of 99.99% corrosion resistant pure platinum
Electrical safety	Lid can be located in one way only, on removal-power is disconnected from buffer chamber
Rapid casting gel	Use casting dams

## ME-20-10-20/ME-20-25, Maxi Horizontal Gel Electrophoresis System

Maxi is primarily designed for resolution of high numbers of samples as in cloning or PCR experiments. Maxi allows ultra high-resolution separations over extended runs. Tray sizes correspond to standard blotter sizes. It also allows for easy



sample transfer onto a membrane for further analysis. Three tray sizes are available, 20 x 20cm, 20 x 25cm and 20 x 10cm. Multi-channel Pipette compatible combs for up to 40 samples each facilitate speed loading of up to 440 samples per gel. 50 sample combs (not multi-channel Pipette compatible) allow maximum sample capability of 550 samples per gel.

### Features:

- Low buffer consumption.
- Single molded tank.
- Three tray options available.
- Multi-channel Pipette compatibility.
- Great indications for gel making and running.
- Up to 450 samples per tray.
- No tapes, clamps or springs needed.

Model	ME-20-10-20	ME-20-25
Unit dimension (WxLxH)	395x230x90mm	
Gel dimension (WxL)	200x100mm, 200x200mm	200x250mm
Maximum sample	200 for 200x100mm tray, 450 for 200x200mm tray	550 for 200x250mm tray
Buffer volume	1200ml	
Construction	Injection molded construction durable, leak proof environment for complete safety and long life	
Cassette type electrodes	Inexpensive, easy to replace, made of 99.99% corrosion resistant pure platinum	
Electrical safety	Lid can be located in one way only, on removal- power is disconnected from buffer chamber	
Rapid casting gel	Use casting dams	

## ME-26-16-24-32, Maxi Plus Horizontal Gel Electrophoresis System

ME-26-16-24-32 is designed for rapid screening of very large numbers of cloning or PCR samples, and it has the maximum capacity of 672 samples per gel. This allows loading and analysis of exactly seven 96 well format micro titer plates. The large gel run length of 32cm also allows resolution of samples over a long distance for separation of complex sample bands such as in restriction fragment analysis. Maxi-plus is available with a full length tray or with other tray length options of 16 or 24cm so that user's exact requirements can be matched.



In addition to options for single length gel trays, Maxi-plus is available with all three gel tray lengths to provide the maximum in flexibility, versatility and value.

Buffer recirculation ports are included as standard to allow enhanced resolution over extended runs while loading guides enhance well visibility for easy sample loading.

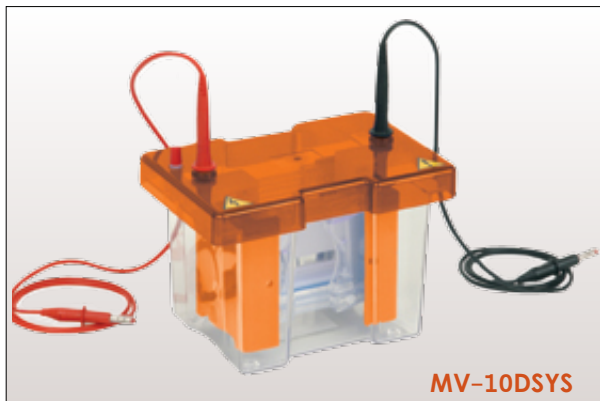
### Features:

- Low buffer consumption.
- Single molded tank.
- Three tray options available.
- Multi-channel Pipette compatibility.
- Great indications for gel making & running.
- Up to 672 samples per tray.
- No tapes, clamps or springs needed

Model	ME-26-16-24-32
Unit dimension (WxLxH)	500x280x90mm
Gel dimension (WxL)	260x160mm, 260x240mm, 260x320mm
Maximum sample	336 for 260x160mm tray, 504 for 260x240mm tray, 672 for 260x320mm tray
Buffer volume	1400ml
Construction	Injection molded construction durable, leak proof environment for complete safety and long life
Cassette type electrodes	Inexpensive, easy to replace, made of 99.99% corrosion resistant pure platinum
Electrical safety	Lid can be located in one way only, on removal- power is disconnected from buffer chamber
Rapid casting gel	Casting dam

### MV-10DSYS, Mini Vertical Gel Electrophoresis Apparatus

Mini Vertical is an injection molded vertical electrophoresis system providing leak-proof environment and safety concerns. In addition, its vertical tank is designed for blotting compatibility. Dual 10x10cm plates is the most popular application and it also has the capability of up to 2 plates. In addition, packages with Minis 300V power supply Series are ideally offered to individuals in the laboratory at a competitive and acceptable pricing to avoid time waiting for those basic instrument and to accelerate the experimental progress.



MV-10DSYS

#### Features:

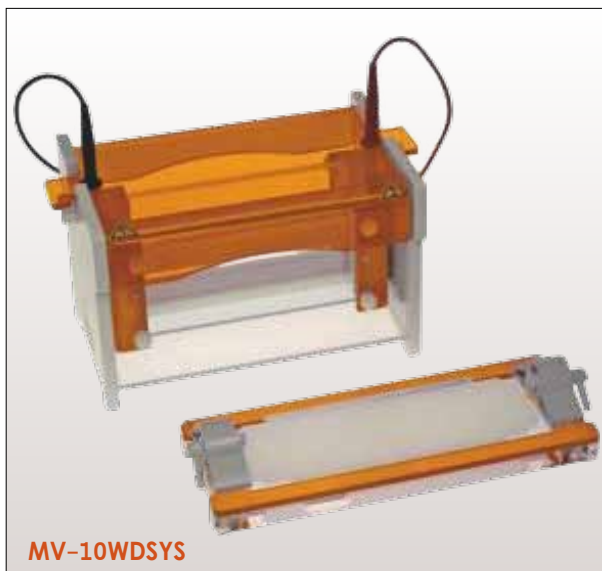
Low buffer consumption • Single molded tank • Compatible with all major types of precast gel • Up to 4 gels run at one time • Great indications for gel making and running • Ice cooling block.

**MV-10DSYS** Complete mini vertical gel electrophoresis apparatus. Mini 10x10cm dual, 2 sets of glass plate with 1mm thick bonded spacers. 2x12 samples, 1mm thick combs, cooling pack, dummy plate and casting base.

Model	MV-10DSYS	MV-10WDSYS
Unit dimension (WxLxH)	190x130x150mm	260x160x160mm
Plate dimension (WxL)	100x100mm	200x100mm
Gel dimension (WxL)	85x80mm	180x80mm
Maximum sample	80 samples, 20 samples per gel	192 samples, 48 samples per gel
Buffer volume	250 ~ 1200ml	600 ~ 2800ml
Ice cooling pack	Yes	
Dummy plate and casting base	Yes	
Construction	Injection molded construction durable, leak proof environment for complete safety & long life	
Cassette type electrodes	Inexpensive, easy to replace, made of 99.99% corrosion resistant pure platinum	
Electrical safety	Lid can be located in one way only, on removal-power is disconnected from buffer chamber	
Rapid casting gel	Use jel maker stand	

### MV-10WDSYS, Mini Wide Vertical Gel Electrophoresis Apparatus

• Offers the capacity of 2 mini gels on a single gel • Rapid gel casting & loading • Optional low or high buffer volumes • Rapid set up cooling. Mini Wide Vertical Electrophoresis System with a gel width of 20cm effectively allows double the number of samples to be resolved as the Mini Vertical Electrophoresis System. This allows consistency of sample comparison on a single gel & is designed for those with greater than 20 samples to compare & resolve. Simple set up using ultra soft silicone seals guarantees trouble free glass plate loading & gel casting. Dual gasket on the gel



MV-10WDSYS

running insert along with notched and plain glass plates ensure leak proof gel running. Rapid set up cooling retains resolution in extended separations and also saves on buffer volume without affecting run quality. 4mm thick glass plates reduce breakage and have bonded spacers for added convenience. A wide range of accessories is available allowing many techniques to be performed using the same unit. Prep combs can be used to maximize sample loading and recovery.

#### Features:

Offers the capacity of two mini gels on a single gel • Rapid gel casting and loading • Low buffer consumption • Single molded tank • Up to 4 gels run at one time • Great indications for gel making & running • Ice cooling pack • Easy gel casting & no gel leakage • Competitive pricing.

**MV-10WDSYS** Mini wide vertical gel electrophoresis apparatus. Mini wide 20x10cm dual, 2 sets of glass plate with 1mm thick bonded spacers. 2x24 samples, 1mm thick combs, cooling pack, dummy plate and casting base.



GDS-01



## GDS-01, Digimage System

The Digimage System is a simple, compact gel documentation system with a rear digital control panel. It contains a digital camera with a superb resolution of 14.7 mega pixels. The image is viewed from a large 8" TFT colorful screen. For limited space, low budget requirements, the Digimage System can be operated computer free. A variety of images can be captured from agarose and other fluorescent gels, colorimetric gels, auto radiography film, and blotting membrane. A safety switch is equipped to turn off the UV Transilluminator automatically when the front door is opened. Files can be saved in a variety of formats, including RAW format, for transfer to a computer for storage and analysis. The Digimage System can also directly connect to a thermal printer for printing the result immediately.

### Features:

- 10.0 megapixel digital camera
- High resolution 8" TFT screen
- Digital control panel
- Compact chamber and lightweight
- Multi focus area selection
- Built-in UV transilluminator
- Can be operated computer free
- Connect port for thermal printer
- Inner 2 x 3 watt white light LED
- Safety door switch
- Multi power source
- Optional gel analysis software package available
- Universal rated voltage: 100~240V.

**This product is offered as a complete system for the user to perform image capture, including:** 1 x Digimage System hood ● 1 x 147 mega pixels digital camera ● 1 x DC coupler ● 1 x lens adaptor ● 1 x 8" colorful TFT screen ● 1 x 2GB memory card ● 1 x memory card reader ● 1 x EtBr filter or SYBR Filter optional).

### Specifications:

Model	GDS-01
Camera	Cannon ® Power SHop G11
Type	5 x optical 14 x digital zoom digital camera
Effective Pixels	approx. 10.0 megapixels
CCD	1/1.7" high-density CCD, total pixels 15.0 million
Maximum Aperature	f/2.8 (W) - f/4.5 (T)
Shutter Speed	15 ~ 1/4000 sec.
Filters	+3 Close up filter and EtBr or SYBR Green filter (optional)
Storage Media	memory card
Computer Interface	USB 2.0 Hi-Speed (mini-B jack)
Video Out	NTSC 1 PAL
Multi-power Source	For camera, inner white LED, TFT screen
Inner White light	2 white LED, 3 watt/LED
Safety Device	Safety door switch
Unit Dimension (mm)	W290xD220xH320
Rated Voltage	110V ~ 240V
Unit Weight	approx. 6.1 kg
Screen Type	8" TFT crystal screen
Resolution	800x600pixels
Brightness	350cd / m <sup>2</sup>
Constant Ratio	300 : 1
Display Mode	NTSC / PAL / SECAM mode auto switching



MRC GSC Series gel document and analysis systems integrate image capture, analysis and print. High resolution, unrivalled definition and exclusive quality CCD camera ensures sensitivity for low limits of fluorescence without losing bands. Powerful image analysis software can help researchers get clear gel photo and detailed analysis result rapidly and accurately. GSC gel document and analysis systems can be used to detect DNA/RNA/protein gel, blotting membranes (including Western, Southern, Northern, Slot, dot blotting), auto radiography film, ELISA plate, thin layer chromatography plate, chemiluminescence/fluorescence develop, etc.



GSC-151

GSC-152

GSC-156

### GSC-151/152/156, Gel documentation and analysis system

- **Structure:**  
Ingenious optics configuration, computer controlled, sealed darkroom and touch control panel.
- **High resolution Camera:**  
High performance and resolution digital CCD camera and CMOS camera.
- **zoom lens with high light transmission efficiency:**  
GSC system comes with an outstanding large-aperture camera lens for optimum light transmission.
- **Exquisite sensitivity and precision:**  
Extremely weak signal can be recognized and close bands can be distinguished from each other. Lowest limits of detection can be 5pg of ethidium bromide stained DNA.
- **Low noise:**  
Latest CCD technology and advanced noise reduction algorithms ensure the high performance image with high signal-to-noise ratio.
- **Illumination:**  
Including UV and White trans-illumination, UV and White epi-illumination.
- **Maximum sample field of view:**  
Approximately 210mm×260mm
- **Professional software for image analysis:**  
Friendly interface and powerful functions. Easy to use – just few clicks are necessary to obtain sophisticated results.
- **High-speed data interface:**  
Single USB2.0 interface to complete command transfer and image capture.

Model	GSC-151	GSC-152	GSC-156
<b>Darkroom</b>	Microprocessor-controlled metal dark room		
<b>Camera</b>	Digital CCD camera, 1.4 million pixels, 12bit		
<b>Pixel size</b>	1360×1024		
<b>Lens</b>	Manual zoom lens, 8-48mm	Motorized zoom lens, 8-48mm	
<b>Filter</b>	590nm multi-layer coating filter		6 position filter wheel, with 590nm multi-layer coating filter
<b>Auxiliary Light Source</b>	LED white light * 2		
	UV-Transilluminator Filter size 21cm x 26cm, Wavelength 302nm		
<b>Trans-White</b>	Uniform white transillumination plate		
<b>Software</b>	Image acquisition, enhancement and analysis		
<b>Operating system compatibility</b>	Windows XP, Vista, win 7		
<b>Power</b>	100V-220V		



## CHS-29/32/34 mini, Western Blot Imaging Systems

CHS mini Series western blot imaging system is a powerful scientific grade imaging system that can handle both Fluorescence and Chemiluminescence imaging applications. Equipped with a high sensitivity cooled CCD camera and FO.95 ultra fast lens, the CHS mini offers the versatility and quality you need in a multipurpose imaging system with no sacrifice in sensitivity or quality.

The CHS mini offers a complete range of acquisition modes suitable for imaging the most commonly encountered fluorescent and chemiluminescent samples.

### Features:

- Three-Stage Peltier Cooled CCD Camera, -60°C below ambient
- High resolution up to 2048x2048
- FO.95 Ultra fast lens
- Multi-wavelength fluorescent light source
- Compact frame, convenient operation and light tight darkroom
- Easy-to-use capture software and versatile image analysis software.

### Application:

- Chemiluminescence - Western Lightning, ECL, ECL plus, CDP Star, Super Signal, CSPD, lumiGlo
- Nucleic acid detection - Ethidium bromide, SYBR™ Gold, SYBR™ Green, SYBR™ Safe, GelStar™, Fluorescein, Texas Red
- Protein detection - Coomassie blue, Silver Star, Sypro™ Red, Sypro™ Orange, Pro-Q Diamond, Deep Purple™.



### Capture and Analysis Software:

CHS-Mini Series analysis software is a sophisticated and intuitive software combining the power of a comprehensive set of analytical tools and automatic functions in an easy to use environment.

### Analysis Software:

- Recognize and number gel lanes/bands and background automatically; add or delete any band, adjust or move any lane as you want
- Density contrast: scan appointed gel lane, describe the scan curve, and then compute the density integral calculus and peak value of each band in this lane.  
You can also carry on tiny adjustment to light density measurement scope & contrast several gel lanes
- Calculate migration rate of each band, electrophoretic distances for the molecular weight, the fragments sizes and the RF values (IEF)
- Calculate the volume quantification, the height and the area. You can also compare the volume of one spot to a reference. Cancel or redo all the operations infinitely.

### Capture Software:

- Obtain gel image through USB interface/TWAIN interface
- Live view 16bit original image
- Time lapse acquisition
- Control light source and lens through software.

### Array Analysis Software:

- Change the row and col of select area as well as set dot diameter size
- Calculate the od value very easily
- Clear all the data and re-select the test area as you want
- Export your analysis results to Excel compatible file or save your analyzed image on your computer
- You can preview the report (including company name and test department, the analyzed image and data) and print up the results.

Model	CHS-29MINI	CHS-32MINI	CHS-34MINI
CCD Size	8.9mm x 6.7mm	11.8mm x 8.9mm	15.2mm x 15.2mm
Pixels	1392x1040, 6.45x6.45um	1600x1200, 7.4x7.4um	2048x2048, 7.4x7.4um
A/D	16bit (65536 grayscale)		
CCD Temperature	-55°C below ambient	-50°C below ambient	-60°C below ambient
Lens	17mm F0.95	25mm F0.95	
Light Source	EPI-White LED light		
Software	Capture & analysis software, free lifetime upgrade		

### Optional Components

Fluorescent light source	365nm, 395nm, 460nm, 490nm, 530nm, 630nm
Filter Wheel	5 position filter wheel/6 position filter wheel
Filters	530nm, 590nm, 630nm, 670nm
Lens	12mm F1.4, 16mm F1.4, 25mm F1.4, 50mm F1.2

**UT-2100C, Microplate Reader**



UT-2100C

**Features:**

- Easy Windows operation system with touch screen or mouse, large LCD display.
- 8-channel optical fiber system enables 5 secs' reading for the whole plate.
- Bichromatic measurement. calculation modes including ABS, Cut-off, Curve, Linear-Log and Exponential regression.
- Large memory, up to 100 test protocols and 10,000 can be stored.
- Auto self-check when power on
- With lamp sleeping and wake-up function
- Random positive and negative control setting
- Multi-assay enables up to 12 different assays on one plate
- Plate shaking function
- Powerful QC function: Grubs, Westguard
- Multi-rule, Levey jennings plot (optional)
- Easy software upgrade by SO card, support USB mouse & keyboard
- Multiform result output including patient comprehensive report
- Ability to communicate with PC for data management(optional).

Model	UT-2100C
<b>Absorbance range</b>	0.000-4.000Abs
<b>Resolution</b>	0.001Abs (display), 0.0001Abs (calculation)
<b>Accuracy</b>	±0.1% or ±0.005Abs (calculation)
<b>Type of microplate</b>	Standard with 96-well or other kind of microplate & strip
<b>Wavelength</b>	405, 450, 492, 630nm, 4 more filters optional (from 400-700nm available on special order)
<b>Optic system</b>	8 channel optic fiber system
<b>Light source</b>	Halogen lamp
<b>Wavelength accuracy</b>	±1nm
<b>Band witch</b>	<8nm
<b>Calculation method</b>	ABS, Cut-off, single standard, curve, multi-percent, percent log, linear, exponential, power, 4PL regression
<b>Reading speed</b>	5 second for 96 well plate (single wavelength)
<b>Shaking plate</b>	Shaking time and speed adjustment
<b>Memory</b>	More than 100 programs, up to 100,000 test results
<b>Interface</b>	RS-232, USB, SD card interface
<b>Display</b>	6" LCD (with touch screen function)
<b>Input</b>	Touch panel or mouse
<b>Output</b>	External printer (optional)
<b>Power supply</b>	AC 110V-220V ±10%, 50/60Hz
<b>Net weight</b>	9kg
<b>Dimensions (mm)</b>	L460xW330xH200

**UT-6100, Auto Microplate Reader**



UT-6100

**Features:**

- PC controlled system, Windows XP.
- 8-channel optical fiber system enables 5 secs' reading for 96-well plate.
- Calculation modes include ABS, Cut-Off, Curve, Linear, Log, Exponential, Power and 4PL regression.
- Up to 12 different tests can be performed in one plate.
- Powerful laboratory management software, more than 100 programs and 100,000 results can be stored.
- Powerful QC programs including Westguard Multi-rule and Instant method, automatic alarm.
- Multiform test reports output.
- Lamp saving and plate shaking.
- Save data automatically when power off unexpectedly
- Compatible with all popular external printers
- Powerful internet connection enables remote data sharing and OS update
- Multi-language software available on request.

Model	UT-6100
<b>Absorbance Range</b>	0.000-4.000Abs
<b>Resolution</b>	0.001Abs (display), 0.0001Abs (calculation)
<b>Accuracy</b>	±0.5% or ±0.005Abs
<b>Type of Microplate</b>	Standard with 96-well or other kind of microplate & strip
<b>Wavelength</b>	405, 450, 492, 630nm, 4 more filters optional (from 400-700nm available on special order)
<b>Measurement range</b>	0.000-2.500Abs
<b>Optic System</b>	8-channel optic fiber system
<b>Light Source</b>	Halogen lamp
<b>Wavelengths</b>	405, 450, 492, 630nm, 4 more filters optional
<b>Wavelength Accuracy</b>	± 1nm
<b>Band width</b>	<8nm
<b>Methodologies</b>	End Point, fixed time, Kinetic
<b>Calculation Method</b>	ABS, Cut-Off, Single Standard, Curve, Multi-Percent, Percent Log, Linear, Exponential, Power, 4PL Regression
<b>Reading Speed</b>	5 seconds for 96 well plate (single wavelength)
<b>Shaking Plate</b>	Shaking time and speed adjustable
<b>Operation</b>	PC operation, bidirectional communications
<b>Memory</b>	More than 100 programs, up to 100,000 test results
<b>Printer</b>	All printers compatible with Windows
<b>Interface</b>	RS-232, USB
<b>Power supply</b>	AC 110V - 240V ± 10%, 50-60Hz
<b>Net Weight</b>	7KG
<b>Dimensions (mm)</b>	L454xW295xH146

## UT-6500, Microplate Reader



UT-6500

### Features:

- UV wavelength available, including 340nm.
- End Point, Fixed time, Kinetic.
- Temperature control(optional), incubation time & temp. adjustable.
- PC controlled system, windows XP.
- 8-channel optical fiber system enables 5 secs' reading for the whole plate.
- More than 500 Programs and minimum 100,000 results can be stored.
- Powerful QC programs including Westguard Multi-rule and Instant method, automatic alarm.
- Calculation modes include ABS, cut-off, curve, linear, log. Exponential, Power and 4PL regression.
- Auto self- check when power on, with lamp saving and plate shaking.
- Random positive and negative control setting.
- Multi-assay enables up to 12 different assays on one plate.

Model	UT-6500
<b>Absorbance range</b>	0.000-4000 Abs
<b>Resolution</b>	0.001 Abs (display), 0.0001 Abs (calculated)
<b>Wavelengths</b>	340,405,450,492,630nm,3 more filters optional
<b>Wavelength accuracy</b>	±1nm
<b>Band width</b>	<8nm
<b>Methodologies</b>	End point, fixed time, Kinetic
<b>Calculation method</b>	ABS, cut-off, single standard, curve, multi-percent, percent log, linear, exponential, power, 4PL regression
<b>Reading speed</b>	5 Seconds for 96 well plate (single wavelength)
<b>Shaking plate</b>	Shaking time and speed adjustable
<b>Plate incubation</b>	Ambient temperature +4~45°C, adjustable
<b>Optic system</b>	8-channel optic fiber system
<b>Light source</b>	Halogen lamp
<b>Operation</b>	PC operation, bidirectional communications
<b>Memory</b>	More than 500 programs, up to 100,000 test result
<b>Printer</b>	All printers compatible with windows
<b>Interface</b>	RS-232
<b>Power requirement</b>	AC 110V/240V ±10%, 50/60 ±1Hz
<b>Net weight</b>	9 kg
<b>Dimensions (mm)</b>	L186xW440xH220

**Standard Filters:** 405nm, 450nm, 492nm, 630nm.

**Special Filters:** 412nm, 420nm, 490nm, 505nm, 540nm, 550nm, 545nm, 546nm, 578nm, 595nm, 590nm, 570nm, 690nm, 650nm, 655nm, 600nm, 690nm, 530nm, 562nm, 620nm, 675nm, 685nm, 660nm.

## FSA-1510, Food Safety Analyzer



FSA-1510

### Features:

- Multiple tests on one analyzer, includes Food Safety Analyze, Pesticide Residues, Veterinary Drug Residues. Antibiotic Residues, Determination of Organic Pollutants, Natural Toxins. Safety of Aquatic Products. Analysis of Biological Pollutants etc.
- Widely applied. not only in labs, but also in On-site Screening, like Food and Drug Administration, Inspection and Center for Disease Control and Prevention, etc.
- Multi-assay enables up to 96 tests and 12 different assays on one plate, 5 sec. for 96 well plate (single wavelength). fast and accurate.

Model	FSA-1510
<b>Absorbance Range</b>	0 - 4,500Abs
<b>Resolution</b>	0.001Abs(Displayed). 0.0001Abs (Calculated)
<b>Accuracy</b>	±0.1%or ±0.005Abs
<b>Type of Microplate</b>	Standard with96-wellor other kind of microplate & strip
<b>Wavelength</b>	410, 450, 492, 630nm, 4 more filters optional
<b>Wavelength Accuracy</b>	±1nm
<b>Band Width</b>	8nm
<b>Calculation Method</b>	ABS, %ABS, Cut-Off, Single Standard, Curve, Multi-Precent,, Precent Log, Linear, Exponential, Power, 4PL Regression
<b>Reading Speed</b>	5 seconds for 96 well plate (single wavelength)
<b>Shaking Plate</b>	Shaking time & speed adjustable
<b>Memory</b>	>100 programs, 100,000test results
<b>Interface</b>	RS-232, USB,SO card & LAN interface
<b>Display</b>	6" LCD, Touch panel
<b>Power Supply</b>	AC 110V - 220V ±10%, 50-60Hz
<b>Net Weight</b>	8kg
<b>Dimensions (mm)</b>	L460xW330xH190

- Variety tests and calculation methods, meeting the requirements from different areas of Food Safety
- Easy Windows operation system with touch screen Or mouse, large LCD display
- 22 pre programmed tests, covers area in Pesticide Residues, Aquatic Pollution. Natural Toxins, Animal Diseases
- Powerful QC function: Grubs, Westguard Multi-rule, Levey Jennings Plot
- Professional software design, sample in two different tests, dilution ratio adjustable
- Multiform result output including patient comprehensive report.



UT-2600C

**Features:**

- Fully automatic.
- Easy Windows operation system, large LCD display.
- Washes flat, U and V-bottom strips and plates.
- 12-way or 8-way manifold, automatic and manual positioning.
- Large memory, up to 50 wash protocols can be programmed.
- Automatic monitoring for vacuum and pressure, automatic rinse cycle.
- Washing pressure volume and time adjustable.
- Liquid level detection & alert function
- No special airtight bottle required for wash bottle.
- Easy maintenance.

**UT-2600C, Microplate Washer**

Model	UT-2600C
Plate Mode	96-/48-well plate or strip
Dispense Precision	CV<2.0%
Residual Volume	<1 $\mu$ l
Washing Volume	50~3000 $\mu$ L for 8-way manifold 50~2000 $\mu$ L for 12-way manifold
Washing Cycle	Maximum 99 cycles
Strip Washing	1 to 12 strips programmable
Soaking Time	0~24hours
Shaking Time	0~24hours
Display	5" LCD
Wash Channels	3 channel bottles, 1 for wash, 1 for water(rinse) and 1 for waste
Bottles Capacity	2 Liters each bottle
Memory	50 washing protocols
Interface	RS-232
Power Supply	AC 110/220V $\pm$ 10%, 50~60HZ
Net Weight	8KG
Dimension (mm)	L390xW340xH180



UT-3100-5

**Features:**

- Fully automatic.
- User friendly operation system with large LCD display.
- Washes flat, U and V-bottom strips and plate.
- 12-way or 8-way manifold, automatic and manual positioning.
- Large memory, up to 100 wash protocols can be programmed.
- Multi-channel, 1 or 3 (optional) for wash, 1 for rinse and 1 for waste.
- Plate shaking function, time and speed are adjustable.
- Two 96-well plate incubation positions (optional)
- Liquid level detection & alert function.
- Easy maintenance.

**UT-3100-5, Microplate Washer, 5 Channels, Build-In Incubator**

Model	UT-3100-5
Plate Mode	96-/48-well plate or strip
Residual Volume	<1 $\mu$ l
Washing Volume	10~3000 $\mu$ l/well, 1 $\mu$ l by step
Washing Cycle	Maximum 99 cycles
Strip Washing	1 to 12 strips programmable
Soaking Time	0~24hours
Shaking Time	0~24hours
Display	Large LCD
Wash Channels	5 channel bottles, 1 or 3 (optional) for wash, 1 for water(rinse) and 1 for waste
Bottles Capacity	2 Liters each bottle
Memory	100 washing protocols
Interface	RS-232
Power Supply	AC 110/220V $\pm$ 10%, 50~60HZ
Net Weight	13 KG
Dimension (mm)	L450xW390xH190

**UT-3900, Microplate Washer****UT-3900****Features:**

- 96-way manifold, automatic and manual positioning.
- Multi-channel, 3 for wash, 1 for rinse and 1 for waste.
- Plate shaking function, time and speed are adjustable.
- User friendly operation system with large LCD display.
- Washes flat, U and V-bottom strips and plate.
- Large memory, up to 100 wash protocols can be programmed.
- Liquid level detection & alert function.
- Easy maintenance.

Model	UT-3900
<b>Plate mode</b>	96-well plate or strip
<b>Residual volume</b>	<1µl
<b>Washing volume</b>	50~3000µl/well, 10/50 continuously adjustable
<b>Washing cycle</b>	Up to 99 cycles
<b>Strip washing</b>	Wash 2 plate at a time, 1-8 strips programmable
<b>Soaking time</b>	0~24 hours
<b>Shaking time</b>	0~24hours
<b>Display</b>	Large LCD
<b>Wash channels</b>	5 Channels, 3 for wash, 1 for rinse and 1 for waste
<b>Memory</b>	100 washing protocols & 10 plates protocols
<b>Interface</b>	RS-232
<b>Power requirements</b>	AC 110/220V±10%, 50±1 Hz
<b>Net weight</b>	23.8Kg
<b>Dimension LxWxH (mm)</b>	610x460x240

**ELI-WAS-200, Semi-automatic Microplate Washer (ELISA Washer)****ELI-WAS-200****Features:**

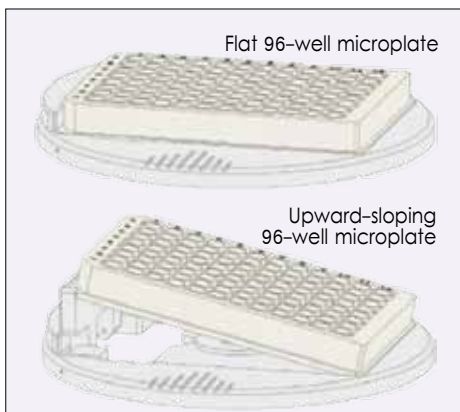
- **Economical** ELI-WAS-200 is very ideal for washing immunoassays in 8-well and 96-well microplate for ELISA procedure; economic price is especially suitable for laboratories with limited budget.
- **Convenient operation** Unique ergonomic platform can accommodate 8-channel dispenser and accept flexible placement of 96-well microplate in flat or upward-sloping way that can reduce residues more efficient.
- **No cross contamination** There are 2 separate rows of tiny S.S. tubes in different length on 8-channel dispenser. The shorter row is used to distribute washing solution and the longer row is used to suck waste liquid. The 2-row design can avoid cross contamination.
- **Autoclavable** The main body of 8-channel dispenser is made of PTFE and its 2-row of tubes are made of SUS 304. Both have a long working life and are autoclavable.

**Ordering Information****196200-11(22)**

ELI-WAS-200, Semi-automatic Microplate Washer AC11011, 60Hz (AC220V, 50Hz).

**196811-00** 8-channel Dispenser.**196100-04** Waste Bottle (2L).**196100-06** Buffer Bottle (2L).**Applications:**

- ELISA washing procedure.
- 96-well microplate washing and dispensing.



Flat 96-well microplate

Upward-sloping 96-well microplate

Model	ELI-WAS-200
<b>Max. flow</b>	500 ml/min, adjustable
<b>Buffer bottle capacity</b>	2 Liter
<b>Waste bottle capacity</b>	2 Liter
<b>8-channel dispenser dimension</b>	137(L)x67(W)x33(H) (mm)
<b>8-channel dispenser material</b>	PTFE
<b>Dispensing tube material</b>	SUS 304
<b>Machine dimension</b>	200(L)x240(W)x130(H) (mm)
<b>Packing dimension</b>	350(L)x310(W)x370(H) (mm)
<b>N.W./G.W.</b>	4.10 / 5kg

**MIC-WAS-100, Gravity-fed Microplate Washer**



**Features:**

● **Economical**

MIC-WAS-100 is a manual dispenser by utilizing the force of gravity, ideal for washing immunoassays in 96-well microplate for ELISA procedure or similar applications.

● **Convenient operation**

Unique designed plate base can accept flexible placement of 96-well microplate in flat or upward-sloping way that can reduce residues more efficient.

● **No cross contamination**

There are 2 separate rows of tiny S.S. tubes in different length on 8-channel dispenser. The shorter row is used to distribute washing solution and the longer row is used to suck waste liquid. The 2-row design can avoid cross contamination.

● **Autoclavable**

The main body of 8-channel dispenser is made of PTFE and its 2-row of tubes are made of SUS 304. Both have a long working life and are autoclavable.

**Ordering Information**

**196100-01**

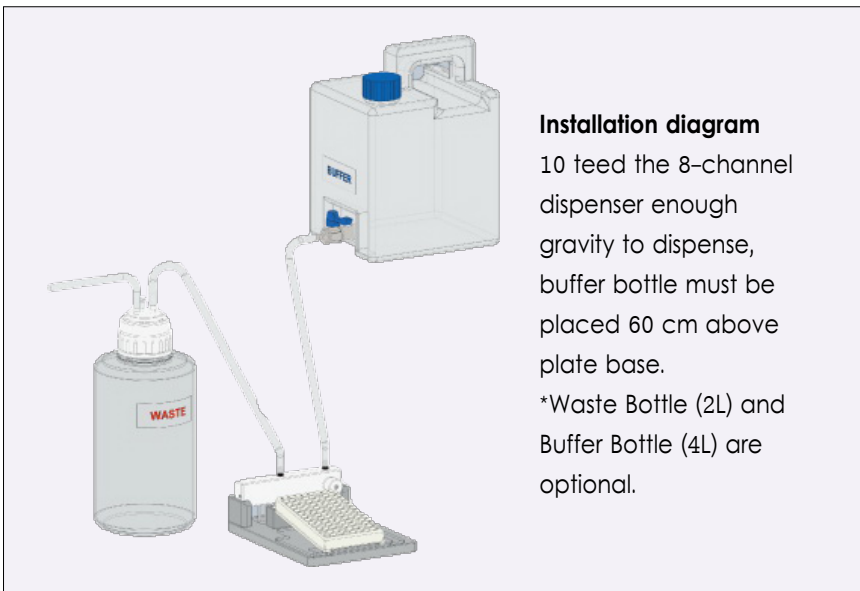
MIC-WAS-100, gravity-fed microplate washer, complete set includes 9-channel dispenser and plate base:

**196811-00** 8-channel Dispenser.

**196100-05** Waste Bottle (4L).

**196100-06** Buffer Bottle (2L).

**196100-02** Microplate plate.



**Installation diagram**

10 feed the 8-channel dispenser enough gravity to dispense, buffer bottle must be placed 60 cm above plate base.

\*Waste Bottle (2L) and Buffer Bottle (4L) are optional.

**Applications:**

- ELISA washing procedure.
- 96-Well microplate washing and dispensing.

Model	MIC-WAS-100
Min. height	Buffer bottle must be placed 60 cm above plate base.
8-channel dispenser dim. (mm)	137(0 x 67(W) x 33(H)
8-channel dispenser material	PTFE
Port thread	3/16 inch (5 mm)
Plate base dimension (mm)	197(Li x 148(W) x 433(H)
Plate base material	Acrylic
Dispensing tube material	51/5304

## High/Low Constant Temperature Chamber

Viewing window with interior light • Stainless steel access ports with plug, for convenient access to test items • Swivel casters for mobility • Easily accessible service areas • Stainless steel internal chamber • Solid state heating switching • Refrigeration system: high efficiency, maximum reliability & low vibration and low noise. The air cooled refrigeration is working with CFC free refrigerant. The total cooling circuits is working with solenoid valve bypass technique ensuring that the compressor will only be disconnected if cooling capacity has not been required for a prolonged period • Heating system: low mass electric resistance heater is located directly in front of the recirculating air blower. The PID microprocessor controllers with the solid state relays allows extremely precise and constant control • Adjustable stainless steel shelves • Optional 100mm chart recorder • Over / under temp. protection devices • Volumes from 36 Liter up to 800 Liters.



TC-80



80 Liter

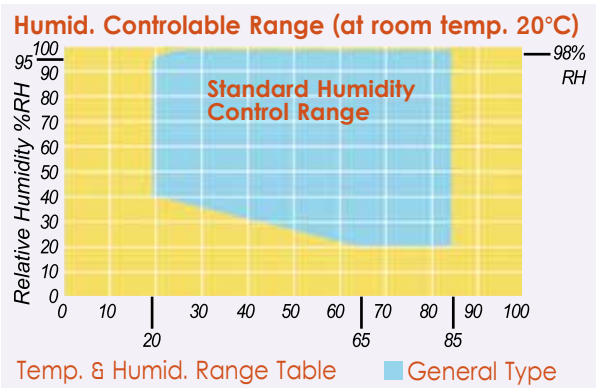
270 Liter

Model	HC-30	HC-40	HC-50	HC-60	HC-80	FC-40	FC-50	FC-60	FC-80	LC-40	LC-50	LC-60	LC-80	TC-50	TC-60	TC-80	
<b>Internal Dimensions (mm)</b>	W	300	400	500	700	1000	400	500	700	1000	400	500	700	1000	500	700	1000
	H	400	500	600	850	1000	500	600	850	1000	500	600	850	1000	600	850	1000
	D	300	400	500	700	800	400	500	700	800	400	500	700	800	500	700	800
<b>External Dimensions (mm)</b>	W	720	930	1030	1230	1530	930	1030	1230	1530	930	1030	1230	1530	1030	1230	1530
	H	1060	1310	1410	1660	1810	1310	1410	1660	1810	1310	1410	1660	1810	1410	1660	1810
	D	620	810	910	1210	1310	810	910	1210	1310	810	910	1210	1310	910	1210	1310
<b>Volume (Liters)</b>	36	80	150	416	800	80	150	416	800	80	150	416	800	150	416	800	
<b>Temperature Range</b>	0°C~100°C(150°)					-20°C~100°C(150°)				-40°C~100°C(150°)				-70°C~100°C(150°)			
<b>Temperature Uniformity</b>	±0.5°C				±1°C	±0.5°C			±1°C	±0.5°C			±1°C	±0.5°C		±1°C	
<b>Temp. Rising Speed</b>	0°C~100°C about 20min					-20°C~100°C about 35min				-40°C~100°C about 40min				-70°C~100°C about 60min			
<b>Cooling Speed</b>	20°C~100°C about 20min					20°C~-20°C about 45min				20°C~-40°C about 60min				20°C~-70°C about 90min			
<b>Temperature Stability</b>	±0.2°C																
<b>Freezing System</b>	Simoleon type full airtight air-cooled refrigeration system										Binary full airtight air-cooled refrigeration system						
<b>Internal Material</b>	SUS304 # Stainless steel																
<b>External Material</b>	SUS304 # Stainless steel																
<b>Temp. Preservation</b>	Material rock wool hard PU polyurethane foams																
<b>Circulation System</b>	Fan forced recycling convection																
<b>Temp. Preservation Heating System</b>	Stainless steel heating type humidifier																
<b>Safety Device</b>	Power leakage & overload protective device, compressor overload protective device, over-temp. & over-humidity circuit breaker protection, water shortage protection, humidifier over-heating protection, temperature limit protective device.																
<b>Standard Accessory</b>	2 x Stainless steel adjustable shelves, vacuum glass perspective window, testing aperture, operating room light, motion wheel, control indicator																
<b>Optional Accessory</b>	Recorder																
<b>Power</b>	AC220V, 1PH, 50/60Hz																



**CCG/PCG-Series, (Programmable) Bench Top Constant Temperature & Humidity Chamber, 80 or 120 Liter**

Bench top Temperature & Humidity Test Chambers offer flexibility, uniformity and control accuracy required for cost effective testing for a variety of products. Ideal for testing smaller products such as computer components, automobile sensors or cellular phones, these chambers combine superior performance with compact design that is perfect for research and development or personal point-of-use testing. Available in two sizes, the Bench top Series chambers allow you to cost effectively select the exact chamber that best meets your environmental test criteria. These chambers can be mounted in an instrument rack or will easily sit on a laboratory bench top. This humidity chambers include an removable water storage tank, avoiding the need for water hook-ups.



**Features:**

- Viewing window with interior light.
- Stainless steel access port with plug, for convenient access to test items.
- Easily accessible service areas.
- Stainless steel internal and external chamber.
- Solid state heating switching.
- Refrigeration system: high efficiency, maximum reliability & low vibration and low noise. The air cooled refrigeration is working with CFC free refrigerant. The total cooling circuits is working with solenoid valve bypass technique ensuring that the compressor will only be disconnected if cooling capacity has not been required for a prolonged period.
- Heating system: low mass electric resistance heater is located directly in front of the recirculating air blower.
- The PID microprocessor controllers with the solid state relays allows extremely precise & constant control.
- Adjustable stainless steel shelves.
- Optional 100mm chart recorder.



**CCG-80:** Fix point PID control LED display.  
**PCG-80:** 5 Programs. 50 steps. 999 cycles. LCD display

Model Controller	CCG-80	CCG-120
Model Programmer	PCG-80	PCG-120
<b>Temp. range</b>	-20°C~100°C	
<b>Humid. range</b>	20%~98% R.H	
<b>Temp&amp;Humid. constancy</b>	±0.5°C±2.5% R.H	
<b>Temp&amp;Humid. uniformity</b>	±1°C±3%R.H	
<b>Heating up time</b>	20°C~100°C within 30 min	
<b>Pull down time</b>	20°C~-20°C within 60 min	
<b>Volume (Liter)</b>	80Liter	120Liter
<b>Interior dimensions(mm)</b>	W400xD400xH500	W500xD400xH600
<b>Exterior dimensions(mm)</b>	W860xD810xH810	W960xD810xH970
<b>Interior/Exterior material</b>	Stainless steel plate (SUS304)/(SUS304) tough powder-coated	
<b>Insulation</b>	Rigid polyurethane foam	
<b>Refrigeration system</b>	Single stage refrigeration	
<b>Safety devices</b>	Refrigerator overload relay, refrigeration high pressure switch, protection relay protection fuse, boil dry protector, overheat protector, alarm viewing window	
<b>Accessories</b>	Shelves (freely adjustable) 2pcs. Chamber lamp	
<b>Power source</b>	AC220V 50/60Hz 1Φ	

**CCG-100/150/250,  
Constant Temperature & Humidity Chamber**



**CCG-100, 100 Liter**



**Air duct structure**  
It applies circular airflow design concept & forced convection simulated air circulation principle. The large power air circulating blades designed specially can produce higher air flow rate and guarantee high even and stable inner bag temperature and humidity.



**Electronic humid. sensor**  
It is used for absolute precise humidity measurement. The humidifying and dehumidifying system is control led electronically. ROTRONIC electronic humid. sensor can guarantee the reliability of humidity inspection even if the samples are changed frequently. The sensor does not require maintenance.



**Innovative refrigerating system**  
International famous brand refrigerant compressor and Germany EBM condenser applying 134a refrigerant and featuring fluorine free, environmental protection, precision and high efficiency are applied.



**Test hole**  
One test hole with the diameter of 45mm made with special mould is arranged on the left and right of the incubator respectively for observation. Internal silica gel soft plugs are provided to make sure the temperature and humidity inside the incubator are not affected during the test.



**Easy for maintenance**  
It is easy to maintain and clean condenser to improve the refrigerating performance and save energy.

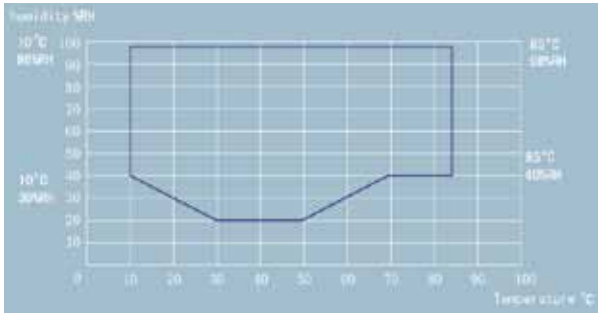


**RS232 interface**  
It is a special interface for PC. One software CD (WINDOWS2000 or simplified Chinese WINDOWS XP operating system) is attached. Test program is written, monitored & saved with special PC software. Test data is directly displayed and printed with special PC software.



**Ponded water inside inner bag can be discharged easily**  
The inner bag applies side, high, middle and low structures to discharge water easily and keep the incubator clean.

Temperature and humidity



Features:

- The incubator is made with imported NC machine tool and laser processing technology. The outside incubator body applies high quality cold rolling plate, which is strongly resistant to rusting. The inner bag applies SUS304 stainless plate
- The incubator bottom truckle is imported from Japan. Its direction is adjustable and it can be locked. The outside incubator body is sprayed with American Dupont powder.
- One test hole with the diameter of 45mm made with special mould is arranged on the left and right of the incubator respectively for observation. Two silica gel soft plugs are provided inside.
- The heat insulating material of incubator applies Germany Bayer freon-free polyurethane one-time

foaming technology to improve the insulating property and reduce energy consumption. It can save over 30% energy in comparison with similar products. The overall strength of incubator is good.

- Rational air duct structure; balance type control method; imported special electric motor and blade are applied to make temperature and humidity distribution even and greatly improve test precision and evenness of temperature and humidity.
- International famous brand refrigerant compressor and Germany EBM condenser applying 134a refrigerant and featuring fluorine free, environmental protection are applied and conform to the world trends.
- Programmed temperature and humidity control; micro-computer fuzzy control PID control; temperature priority and time priority; optional for the user. Intelligent programmed mode is applied. The control part applies high brightness super large LCD and fuzzy PID control method to be more humanized.
- Temperature sensor PT1 00 applies Honeywell product. The humidity sensor applies Swiss Rotronic capacitive sensor.
- Over-temperature protection, creepage protection, door open alarm, current failure;e alarm and sensor alarm functions are provided to improve the safety. Meanwhile, automatic start, stop, timed operation, clock display and self recover after power fails are provided.
- Automatic defrosting and manual defrosting functions are provided for long term test to solve the problem of temperature and humidity drifting.

Model	CCG-100	CCG-150	CCG-250
Convection method	Compulsory convection method		
Control method	Balance type		
Temperature range	-10°C ~ +85°C		
Humidity control scope	20 ~ 98%		
Temperature resolution	0.1°C		
Temperature fluctuation	±0.1°C		
Temperature evenness	±0.5°C (65°C)		
Humidity fluctuation	Within ± 1.5% (65°C)		
Working room temperature	5 ~ 35°C		
Insulating material	Overall foaming of polyurethane		
Programmed control	Fuzzy logistic PID control method common operating mode/programmed operating mode		
Overall dimension(mm)	W590 x D733 x H1140	W665 x D733 x H1300	W765 x D773 x H1490
Inner dimension (mm)	W465 x D400 x H540	W540 x D400 x H700	W640 x D440 x H890
Weight	About 93KG	About 114.5KG	About 137KG
Effective volume	100L	151L	250L
Total power of heating and humidifying	1000W	1450W	2000W
Refrigerating power- refrigerant	175W,R134a	245W,R134a	270W,R134a
Water supply volume	Inside: 10 L Outside: 25 L		
Power voltage	AC-220V 50/60Hz		
Tray (standard configuration)	Two layers	Three layers	Three layers

- Performance parameter test under empty load: Ambient temperature of 20°C, ambient humidity of 50%RH.
- Temperature and humidity fluctuation exceeding the scope noted in the table is normal under defrosting condition.
- The change of product appearance and parameter will not be notified additionally. Product appearance may deviate due to shooting and printing reasons.

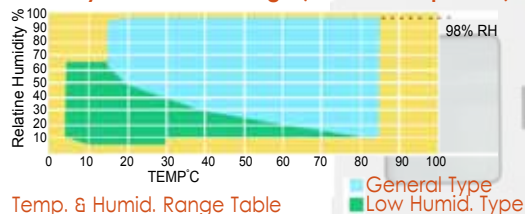


**Features:** Adjustable stainless steel shelves • Optional 100mm chart recorder • Over / under temp. protection devices • Automatic water level control • Volumes from 36 Liter up to 800 Liters • Viewing window with interior light • Stainless steel access ports with plug, for convenient access to test items • Swivel casters for mobility • Easily accessible service areas • Stainless steel internal chamber • Solid state heating & humidity switching • Stainless steel humidity generator with viewing window • Low water level humidity heater protection • Wet Dry bulb humidity sensor • Refrigeration system: high efficiency, maximum • reliability & low vibration & low noise. The air cooled refrigeration is working with CFC free refrigerant. The total cooling circuits is working with solenoid valve bypass technique ensuring that

## Temp.&Humidity Environmental Chamber

Temperature and Temperature/Humidity test chambers provide superior performance over a wide range of applications. From prototype to durability to product component screening tests, the chambers has been designed to meet quality standards while still offering flexibility uniformity and control accuracy for cost-effective testing. Available in a multitude of chamber sizes, MRC is sure to have the exact chamber that best meets your environmental test criteria. For testing smaller products or for customers with limited space, MRC offers chambers starting at 36Liter capacity up to 800 Liters. MRC Test Chambers are able to perform both high and low temperature tests. Many of these chambers have a temperature range of -70°C to +150°C. Hermetically sealed compressors provide moderate temp. change rates while allowing the chamber to consume less power than comparable chambers. Temp./ Humidity models are equipped with a reliable, accurate and efficient full range humidity system capable of simulating conditions from 20 to 98% RH.

### Humidity Controllable Range (at room temp. 20°C)



Temp. & Humid. Range Table

the compressor will only be disconnected if cooling capacity has not been required for a prolonged period • Heating system: low mass electric resistance heater is located directly in front of the recirculating air blower. The PID microprocessor controllers with the solid state relays allows extremely precise and constant control.

Model Programer	HP-30	HP-40	HP-50	HP-60	HP-80	FP-40	FP-50	FP-60	FP-80	LP-40	LP-50	LP-60	LP-80	TP-50	TP-60	TP-80	
Model Controller	HG-30	HG-40	HG-50	HG-60	HG-80	FG-40	FG-50	FG-60	FG-80	LG-40	LG-50	LG-60	LG-80	TG-50	TG-60	TG-80	
<b>Internal Dimensions (mm)</b>	W	300	400	500	700	1000	400	500	700	1000	400	500	700	1000	500	700	1000
	H	400	500	600	850	1000	500	600	850	1000	500	600	850	1000	600	850	1000
	D	300	400	500	700	800	400	500	700	800	400	500	700	800	500	700	800
<b>External Dimensions (mm)</b>	W	720	930	1030	1230	1530	930	1030	1230	1530	930	1030	1230	1530	1030	1230	1530
	H	1060	1310	1410	1660	1810	1310	1410	1660	1810	1310	1410	1660	1810	1410	1660	1810
	D	620	810	910	1210	1310	810	910	1210	1310	810	910	1210	1310	910	1210	1310
<b>Volume (Liters)</b>	36	80	150	416	800	80	150	416	800	80	150	416	800	150	416	800	
<b>Temperature Range</b>	0°C~100°C(150°)					-20°C~100°C(150°)				-40°C~100°C(150°)			-70°C~100°C(150°)				
<b>Humidity &amp; Temp. Uniformity</b>	±0.5°C ±3%RH				±1°C ±5%	±0.5°C ±3%RH			±1°C ±5%	±0.5°C ±3%RH			±1°C ±5%	±0.5°C ±3%RH		±1°C ±5%	
<b>Temp. Rising Speed</b>	0°C~100°C about 20min					-20°C~100°C about 35min				-40°C~100°C about 40min			-70°C~100°C about 60min				
<b>Cooling Speed</b>	20°C~0°C about 20min					20°C~-20°C about 45min				20°C~-40°C about 60min			20°C~-70°C about 90min				
<b>Freezing System</b>	Simoleon type full airtight air-cooled refrigeration system									Binary full airtight air-cooled refrigeration system							
<b>Humidity Range</b>	20%~98%RH							Temp. & humid. stability		±0.2% ±2%RH							
<b>Temp. &amp; Humidity Adjustment</b>	Balancing temperature & humidity adjustment method							External material		SUS304 # Stainless steel							
<b>Internal Material</b>	SUS304 # Stainless steel							Humidification		Surface Steam type, stainless heating humidifier, with humid. water shortage power interruption & thermal protection							
<b>Temp. Preservation</b>	Material rock wool hard PU polyurethane foams							Temp. preservation heating system		Stainless steel heating type humidifier							
<b>Circulation System</b>	Fan forced recycling convection							Xeransis system		refrigeration invisible heat xeransis method							
<b>Water Supply System</b>	Front-positioned water tank, fully automatic water supply control, recycling filter re-utilization with water shortage alarm device																
<b>Safety Device</b>	Power leakage & overload protective device, compressor overload protective device, over-temperature & over-humidity circuit breaker protection, water shortage protection, humidifier over-heating protection, temperature limit protective device.																
<b>Standard Accessory</b>	2x Stainless steel adjustable board sets, vacuum glass perspective window, testing aperture, operating room light, motion wheel, control indicator																
<b>Optional Accessory</b>	Recorder							Power		AC220V, 1PH, 50/60Hz							

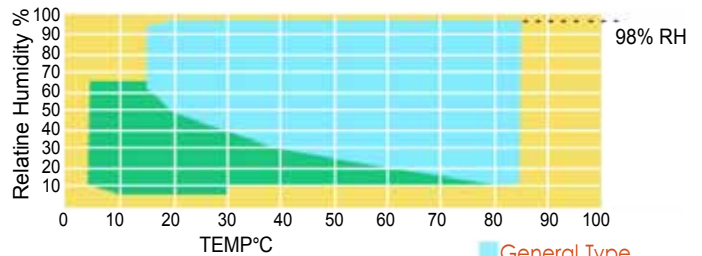


H243-LPVST

**H243-LPVST, The Walk-In Environmental Test Room**

The walk-in environmental test room is composed of the thermal wallboard by means of pu foaming. It is easy to disassemble & transport. According to the environmental conditions that customers required, the test machine may be used as the burning room, thermostat room and thermostat-humidistat room if it is equipped with the accurate control system of microcomputer for test room have two kinds to be selected: one is the stainless steel and the other one is the sheet baked by paintings.

**Humidity Controllable Range (at room temp. 20°C)**



Temperature & Humidity Range Table ■ General Type ■ Low Humidity Type

Model description: H243-LPVST			
H	<b>Width</b> A=900mm B=1800mm C=2700mm D=3600mm E=4500mm F=5400mm G=6300mm H=7200mm I=8100mm		
24	<b>Height</b> 21=2100mm 24=2400mm 27=2700mm 36=3600mm		
3	<b>Deep</b> 1=1800mm 2=2700mm 3=3600mm 4=4500mm 5=5400mm 6=6300mm 7=7200mm 8=8100mm		
L	<b>Temp. Range</b> B=rm. temp. +5°C~70°C H=0°C~70°C F=20°C~70°C G=30°C~70°C L=40°C~70°C T60°C~70°C		
P	G=set value of thermostat and humidistat, P=programmable thermostat and humidistat, C=thermostat room		
V	O=thermostat&humidistat control by set value, T=T-type programmable thermostat and humidistat control, E=E-type Programmable thermostat and humidistat control humidistat room, M=M-type programmable thermostat and humidistat control, N=thermostat control by set value, V=V-type programmable control, P=P-type programmable control, H=H-type programmable control		
S	<b>Outside material</b> , S=stainless steel, T=sheet coated with resin		
T	<b>Inside material</b> , S=stainless steel, T=sheet coated with resin		
<b>Construction</b>	Thermostat and humidity	Thermostat room	Heat engine room
<b>Temperature Range</b>	H=0°C~70°C L=40°C~70°C F=20°C~70°C T=60°C~70°C G=30°C~70°C		B=RT. +5°C~70°C
<b>Control accuracy</b>	±0.3°C ±3%RH		±0.3°C
<b>Accuracy of distribution</b>	±1°C ±5%RH		±1°C
<b>Circulatory system</b>	Convection by fan forced circulation		Convection by fan forced circulation with an additional hot air exhausting unit
<b>Humidifying system</b>	Vaporized from surface		
<b>Heating system</b>	Heat dissipated by stainless steel		
<b>Dehumidifying system</b>	Desiccated by frozen latent heat		
<b>Freezing system</b>	Heat desiccated by way of air or water cooling with high effective freezing unit		
<b>Power source</b>	AC220V/AC380V, 50/60Hz		
<b>Safety device</b>	Leakage and overload protection device, compressor overload protection device, power-off device for over-temperature and over humidity, water insufficient protection device, over-temperature protection, device for humidifier and the protection device for limit of temperature		



GCC30

**Options:**

- Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation)
- 300°C optional maximum temperature
- Optional liquid nitrogen injection system to reach -150°C (including 2m insulated stainless steel pipe & pressure relief valves)
- Access ports for cables & pipes
- Programmable controls with additional segments & multi-program capability
- Interior light (subject to temperature limitations) or through window illumination kit
- Additional shelves as required
- A wide range of sample loading & handling accessories can also be supplied
- Paperless DAQ (Data Acquisition) graphical recorders available.

**Access Ports:** A nominal 50mm diameter cable port is located centrally on the left hand side of the inner chamber wall.

**Air Circulation:** Forced air circulation is provided by a rear mounted fan. The fan is mounted behind an air guide to prevent it being touched by the operator.

**Shelves and Runners:** The chamber is supplied with three pairs of fixed shelf runners. Two perforated stainless steel shelves are supplied.

**Temperature Control:** The temperature of the chamber is controlled by a Eurotherm 3216 digital indicating microprocessor based three term time/temperature program controller. The controller is fully adjustable and may be "tuned" by the customer to suit the temperature and load in the chamber.

**Under/Over Temperature Control:** A Eurotherm 2132 controller is fitted as a low and high temperature cut out. If a fault causes the main set point temperature to be exceeded then a safety contactor will isolate the heating elements and solenoid valves. The over temperature circuit must be manually reset when the chamber has warmed up or cooled down and the fault has been cleared.

**Heating System:** The chamber is heated by mineral insulated metal sheathed elements. The low surface watt loading of the elements ensures a long and reliable service life.

**Cooling System:** The chamber is cooled by liquid Nitrogen. A cool channel circuit in the controller switches a solenoid valve to control the direct injection of liquid into the chamber. A second solenoid valve in the supply line is controlled by the under temperature controller and will switch off the liquid Nitrogen if the direct injection valve fails in an open condition. Appropriate pressure relief valves are included to ensure a safe working system. A two metre length of insulated flexible stainless steel hose is supplied for connection of the equipment to the customers bulk supply.

**Build Standards:** The oven is designed and built to good engineering practice in a facility having a certificated quality assurance scheme to ISO 9001:2008. It complies fully with the relevant UK and European Union Health and Safety at Work legislation. It is compliant with the EU Low Voltage and EMC directives and carries the CE mark.

**GCC-Series, Gas Cooled Chambers**

Direct injection liquefied gas cooling using liquid CO<sub>2</sub> to achieve -60°C (or optionally using liquid nitrogen to achieve -150°C) & rapid heating to 200°C as standard (or optionally 300°C) all under the control of a sophisticated 8 segment pair controller. Enables the most rigorous temperature test profiles to be used for accelerated age testing or environmental simulation.

**Thermal Range:** The working temperature range of the chamber is -75°C to +400°C.

**Thermal Performance:** The equipment has sufficient power to enable a heating rate of up to 10°C/minute with a small thermal load. Temperature stability under steady state conditions is better than ±0.5°C. Temperature uniformity throughout the empty chamber measured not less than 75mm from any surface is better than ±0.5°C.

**Internal Chamber Construction:** The internal chamber is fabricated from 304 grade polished stainless steel. All the joints are externally sealed to prevent moisture entering the insulation when the chamber is used at temperatures below ambient.

**External Construction:** The main case of the chamber is fabricated from mild steel rectangular hollow section panelled with zinc coated mild steel sheet. All external surfaces are finished with grey powder paint.

**Thermal Insulation:** The inner chamber is insulated with high quality ceramic fibre and mineral wool blanket of adequate thickness to ensure a safe outer case temp.

**Chamber Door:** The chamber is fitted with a single door that is hinged on the left hand side and opens to give full access to the chamber. The door is fabricated from zinc coated mild steel sheet for the exterior and 304 grade stainless steel for the interior. The door is fitted with silicone rubber door seals to reduce heat leakage through the joints.

Model	Temp. range (°C)	Heat-up time to Max. (mins)	Temp. stability °C PID	Temp. uniformity 300°C (±°C)	Cool-down time to -60°C (mins)	Dimensions		Shelves Fitted/accepted	Shelf loading Each/total (kg)	Max. Power 200°C	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)				
GCC30	-60 to 200	26	±0.5	±5.0	12	310x300x300	570x765x770	2/3	10 20	750	single phase
GCC60	-60 to 200	26	±0.5	±5.0	12	410x400x380	670x865x870	2/5	10 30	1000	
GCC120	-60 to 200	26	±0.5	±5.0	12	660x500x380	920x965x870	2/9	10 40	1500	

Uniformity values are measured with vents closed in a steady state chamber after a stabilization period. Shelf loadings are based on evenly distributed weight. Gas cylinders & Dewars are not included as part of the standard offer.



FP-500

**FP-500 Series, Fuming Chamber For Finger-Print Taking**

**Features:**

- Specially designed for finger print taking
- Pre programmed for easy to make finger print show up on objects
- Automatic air filtering and cleaning and ventilation
- In cabinet lamination
- 1 mm galvanized steel housing with powder coating OR Stainless steel housing
- Large observation window.

**Applications:**

- Police station Investigation bureau
- Military police
- For forensic investigation.

Model		FP-500	FP-500DL
<b>Power Supply</b>		100~120 VAC 1 phase 50/60 Hz; 200~240 VAC 1 (or 3) phase 50 (or 60) Hz;	
<b>Max Current (A)</b>	100~120V	10A	
	200~240V	5A	
<b>Humidity Control System</b>		Microcomputer P.I.D control with automatic crash release device (watch dog) in case of system down.	
<b>Ambient Temperature</b>		-10 ~ +40 °C	
<b>Performance</b>	<b>Cyanoacrylate Heating Rate</b>	20 to 100 °C with in 2 minutes (up to 150°C)	
	<b>Humidity Range</b>	Ambient ~ 99 %RH	
	<b>Humidity Fluctuation</b>	± 5%RH	
	<b>Humidity Add Up Rate</b>	50%RH to 80%RH within 30 minutes	
<b>Chamber Structure</b>	<b>Material</b>	<b>External</b>	1mm thick galvanized steel plate with powder coating, 5mm tempered glass front panel
		<b>Internal</b>	1mm thick #304 stainless steel
	<b>Insulation</b>	N/A	1mm thick #304 stainless steel, 5mm tempered glass front panel
	<b>Filtering Tank</b>	1 mm stainless steel	
	<b>Air Filtering Fan</b>	Brushless/Sparkless blower	
	<b>Circulation Fan</b>	Propeller impellers	
	<b>Humidity Sensor</b>	US made low humidity sensor	
<b>Filters</b>		Hybrid carbon & Pre filter/10Pk	
<b>Control Panel</b>		19x219mm 5 keys membrane touch key pad, 7 LED indicators, Dual 3 digits temperature display for setup and current temperature value.	
<b>Programmable Control</b>		Fuming time; Heating time and temperature; Air cleaning time; Humidity level	
<b>Datalogger</b>		N/A	Built-in 3600 sets of parameter (unlimited when connect to computer), Recording interval: 30 sec ~ 99 hrs.
<b>Computer Connection</b>		N/A	RS-232; RS-485; RJ-45 (Optional)
<b>Automatic Lock</b>		N/A	Synchronized with fuming activity
<b>Lighting</b>		Vapor - proof fluorescent light	
<b>Safety Devices</b>		Automatic door lock when fuming and air cleaning. Emergency stop. Filter condition alarm. Audible and visible alarm.	
<b>Accessories</b>		Shelves (3 PCS); Hooks (20 PCS); Caster wheels; Stabilizers; Instruction manual; Warranty	
<b>Inside Capacity (Liter)</b>		408	408
<b>Dimensions</b>	<b>Inside Dimensions (mm)</b>	W560 D700 H1040	W560 D700 H1040
	<b>Outside Dimensions (mm)</b>	W880 D870 H1910	W880 D870 H1910
<b>Weight (kg)</b>		150	150



### MSS-A/B, Salt Spray Testers

**Testing Chamber:** It is made of P.V.C. sheet, its internal structure uses advance technical of stainless steel pipe. The feature is well-reinforced, temperature well kept, and deformed free & keep temperature stable

- Heat-up method of chamber is "5 direction heat-up method", able to control constant temperature inside chamber ( $\pm 1^{\circ}\text{C}$ )
- Saturated air tank: The heating air purpose saturated air tank for mist spraying is made of stainless steel SUS 304, its feature with press-resistant, water-leakage free, air-leakage free, and deformed free, This installation also included auto-deleted when over pressure, to ensure a longer life span
- Heating constant temperature installation: It using 5 directions heating up by water type to control temp. Ensure temperature kept and constantly. It is also help to prevent the Choppy temperature- Electricity saving for

long period use

• Specimen placement: The specimen angle is  $15^{\circ}/30^{\circ}$ . Place them average ready to test, standard specimen size is 150 x 70mm or 100 x 65mm, finished-products test directly is also available. It is use glass-made nozzle and conformed to Bernoulli theorem to make salt a mist shape & fallen mist capacity is adjustable. (Generally use 1-2cc/hour) **Usage:** Salt spray tester is used for testing rust-proof treatment of material, such as metal surface that after painting, coating, electroplating, anodizing, films of organic and non-organic...etc. It's a corrosion and Rust-Resistant test. It is for checking the corrosion-resistant of products (specimen) under long time corrosion after treatment like anodize, rustproof oil, chemical, etc.

**Accessories:** 1) Air compressor: 1Set. 2) Testing purpose pharmaceutical products: NaCl (Sodium chloride), NaOH (sodium hydroxide), CuCl (copper (I) chloride), and CH<sub>3</sub>COOH (glacial acetic acid) each one bottle. Adjust appliances: Litmus paper, spoon, straw, and concoct tank for each • The main difference between the above stated types are the testing chamber's capacity. Other functions are the same • The industrial standard request the testing capacity reached 0.43m<sup>3</sup> or above. Selecting proper type according to consumer's specimen size requirement.

Model		MSS-A	MSS-B
Internal Dim. (cm)		W60xD40xH45	W90xD50xH60
External Dim. (cm)		W125xD106xH94	W155xD120xH105
Quantity of collecting cup		1PC	2PC
Power of heater (Watt)		1000W	2000W
Temp. range	Chamber	Room temp. $\sim 50^{\circ}\text{C}$	
	Air	Room temp. $\sim 63^{\circ}\text{C}$	
Features	Temp. constancy	$\pm 0.5^{\circ}\text{C}$	
	Saturated air pressure (kg/cm <sup>2</sup> )	0.8~2.0 $\pm 0.01$	
	Spray volume (ml/80cm <sup>2</sup> /hr)	0.5~0.3	
	PH-salt spray test	6.5~7.2	
	PH-CASS test	3.0~3.2	
Material	Exterior	P.V.C or P.P	
	Interior	P.V.C or P.P	
System	Salt spray vehicle	Air+acid (base) liquid	
	Heating	SUS#316 Stainless steel heater+Teflon coating	
	Control	Digital electronic control	
Power source		AC 1Ø, 220V $\pm 10\%$ , 50/60Hz	



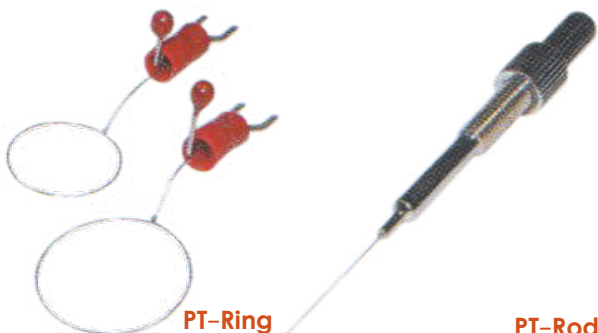


PAK6

Model	PAK6
Applicable Sample	ds DNA, ss RNA, Protein
Electro-rod & Electro-Ring	Platinum
Dimensions (mm)	W290xD135xH150
Weight	1.8kg

- It is possible to purify samples within an hour. You can apply agarose and polyacrylamide gel slices including nucleic acid or protein on the EXELUTOR Pak6 and apply at 25–35V for 2–5min. In case of incomplete elution, a second attempt can be made by replacing the buffers. The Elution time is flexible according to the kinds and sizes of samples and in case of linear DNA, 4min is sufficient for the size up to 10kb. Eluted DNA can be extracted with phenol! chloroform once and then ethanol-precipitated according to the routine methods. High yield of more than 90%.
- Since disposable parafilm is used for the sample plate, you don't have to worry about contamination.
- 0.2–0.5ml of buffer is sufficient for elution.
- There is nearly no trouble.
- It is easy to handle.

#### Accessories:



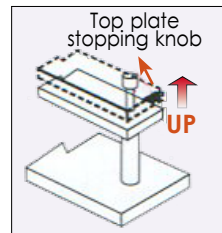
PT-Ring

PT-Rod

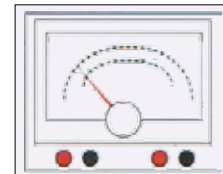
#### PAK6, Exelutor, Capacity-6 samples

- Economical & quickest equipment with the best yield
- 95% elution within 4 minutes. (DNA, RNA, PROTEIN)
- Sturdy, small and easy to handle
- 6 different samples can be applied simultaneously
- 0.2–0.5ml of buffer is sufficient for elution.

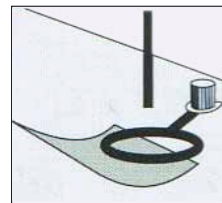
#### How to Use:



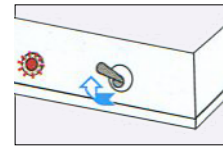
- Lift up the top plate and fix it up by the stopping knob.



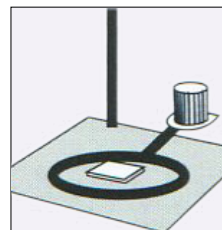
- Control the voltage in the between 20V–40V on power supply. If the voltage over 50V. The lamp and electrode could defected.



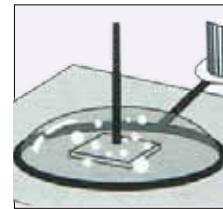
- Place the disposable parafilm under the electronic ring.



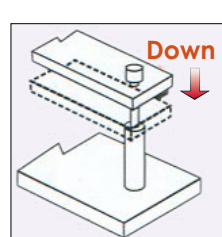
- Turn on the switch.



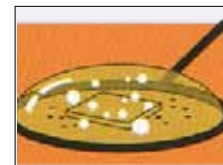
- Place a gel slice on the center of the electronic ring.



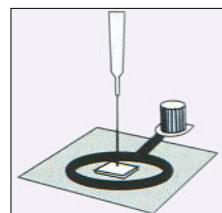
- Come out small bubbles from gel slice.



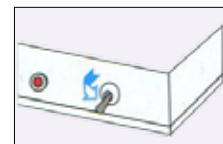
- Lift the top plate down.



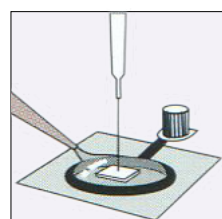
- Using UV lamp. The DNA coming out from gel slice could be seen.



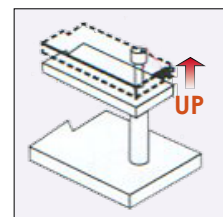
- The Electrode should be touched on the gel slice.



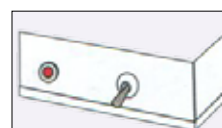
- After 2–4min. Turn out the switch.



- Pull the buffer out inside the electronic ring enough to cover the gel slice.



- Lift the top plate.



- Confirm the switch and the lamp off.



- Absorbing the buffer by a Pipette.

# F FERMENTORS

## FS-Series, Entry-level Fermentor Bioreactor, 4 - 13.4 Liters

Easy-to-use, entry-level system, with built in controls for operation as a microbial fermentor as well as mammalian/animal cell culture bioreactor. This versatility, coupled with its ability to control up to three independent reactors from a single control station, makes it ideally suited to use in R&D labs, universities, teaching facilities, testing labs, and more.

Applications: Microbes, yeast, insect, plant or mammalian cells, in batch, fed-batch and continuous culture.

### Optional Item:

1. Oxygen Enrichment Device
2. One external pump
3. Fluorescent Lamp On/Off control - Included 4 sets of T5 Fluorescent Lamp & a external Timer on/off control (24hr).


### Software:



	Jacket vessel (Dish bottom)	Single wall with blanket	Single wall (Plain bottom)	Single wall (Dish bottom)	Air lifter
<b>Mammalian Cell Culture</b>	☺	☺	∅	∅	∅
<b>Aerobic Microorganism Culture</b>	☺	☺	☺	☺	◆
<b>Micro-aerobic Microorganism</b>	☺	☺	☺	☺	∅
<b>Anaerobic Microorganism</b>	☺	☺	☺	☺	∅
<b>To culture Fragile Cell</b>	◆	◆	∅	∅	☺
<b>Photosynthesis Culture</b>	∅	∅	◆	☺	☺
<b>Plant Cell Culture</b>	☺	☺	∅	☺	☺
<b>Insect Cell Culture</b>	☺	☺	∅	◆	∅

☺: Excellent ◆: Well ∅: Not Recommended

Field	Products
<b>Medicine Products</b>	Antibiotics; Hormones; Vaccine; Immune Modulators; Blood Proteins etc.,
<b>Agriculture Products</b>	Veterinary Medicine; Biotec Fertilizer; Microbial Insecticides etc.,
<b>Food Additive Products</b>	Amino Acids ; Vitamins ; Organic Acids etc.,
<b>Chemical &amp; Energy Products</b>	Ethanol; Glycerol; Methane etc.,
<b>For Environment Products</b>	Digest Waste Microorganism
<b>Other Product</b>	Bioleaching Of Metals; Genetically Engineered Spiders; Silk Proteins
<b>Biomass Products</b>	Baker's Yeast; Mushrooms; Algae; Single-Cell Proteins etc.,
<b>Enzyme</b>	Amylases; Celluloses; Proteases; Microbial Rennin; Lipases; Glucose Isomerase; Penicillin Acylase; Cholesterol Oxidase etc.,
<b>Metabolism Products</b>	- Fermentation Products – Ethanol; Lacto Acid; Butanol; Acetone - Growth Factors –Amino Acid; Vitamins; Citric Acid etc., - Secondary Metabolites – Antibiotics; Alkaloids etc., - Gene Products: Insulin; Human Growth Hormone; Interferons; Interleukins; Blood-Clotting Factors; Serum Albumin; Hepatitis B Vaccine; Rabies Vaccine And Diarrhea Vaccine For Pigs; Monoclonal Antibodies etc.,


Dry heating system (Plain bottom type vessel)				
<b>Vessel</b>	Single wall vessel (Plain bottom)			
	Total volume(Liter)	3L 4	5L 7	7L 9.3
<b>Control unit</b>	Material	Borosilicate glass / 316L ss for head plate and all fittings		
	Control panel	10.4" Color Touch screen Interface		
	Communication port	Remote control through Ethernet (SCADA)		
	Storage Program	Up to 59,994 program for different kinds of condition		
	Data storage	Up to 10 data files		
	Data storage interface	USB port		
	Cabinet material	ABS front panel and iron painted housing		
	Dimension	Footprint: 400 x 500 mm (W x D) ; Height: 740 mm		
<b>Aeration</b>	Rated voltage	110V or 220V ; 50/60 Hz		
	Inlet Gas Flow-meter	1 – 10 LPM		2 – 20 LPM
	Impeller	Three adjustable Rushton-type impellers		
	Sparger	Orifice ring		
<b>Temperature</b>	Baffle	Removable 316L stainless steel baffles		
	Heating	Bottom heating plate (Base unit)		
	Cooling	Cooling coil (Internal heat exchanger)		
	Range	5°C above coolant up to 90°C		
	Probe	Platinum RTD probe (Pt 100); 0 ~ 90°C		
<b>Agitation</b>	Control mode	Programmable 15 steps PID controller		
	Drive	Removable Top brushless motor		
	Speed Range	Two type of agitation motor : a. 30 – 1200 rpm is for general Fermentor; b. 5 – 300 rpm is for shear-sensitive cell line (optional)		
<b>pH</b>	Control mode	Programmable 15 steps PID controller		
	Range / Probe	2-12 pH / Gel-filled electrode; Autoclavable		
<b>DO</b>	Control mode	PID		
	Range / Probe	0 – 200% / Polarographic DO sensor; Autoclavable		
<b>ORP</b>	Control mode	PID; Cascade function to response to a. Stepping increasing or decreasing agitation speed b. Oxygen Enrichment Device (optional) c. To start substrate feeding program.		
	Transmitter	-/+ 2000 mV		
<b>Foam</b>	Probe	Gel-filled electrode; Autoclavable (optional)		
	Probe	316L stainless steel protector with insulated Teflon tube; On/Off controller		
<b>Peristaltic pump</b>		Built-in 4 sets of pumps; One external pump (optional)		
		Precise Stepping motor; min. speed is 1 rpm		
	Speed range	0 – 65 rpm		
<b>Exhaust</b>	Control mode	Programmable 15 steps feeding control; Pump can be assigned for Acid, Base, Anti foam and Substrate		
		316L Stainless steel condenser		

**Optional Item:**

1. Low Speed Agitation Driver : 5 ~ 300 rpm
2. Oxygen Enrichment Device
3. One external pump  
Specification :  
- Model # : MU-D01  
- Rpm and increment : 20 ~ 300 rpm ; 1 rpm  
- Motor Type : Brush-less motor  
- Number of roller : 1
4. Fluorescent Lamp control - Included 4 sets of T5 Fluorescent Lamp and a external Timer on/off control (24 hr)
5. ORP probe : Gel-filled electrode; Autoclavable

**Utility Requirement:**

1. Building main supply 110V- 60 Hz or 220V - 50 Hz with electrical safety cutoff switch.
2. Autoclave for sterilization.
3. Cooling Circulating Water Bath for cooling purpose.
4. Compressor Air to supply air, which comes with a reducer to control pressure to around 1 kg/cm<sup>2</sup>. This air is to be dry, oil-free and filtered.
5. Computer for remote control.


Dry heating system (Dish bottom type vessel)							
<b>Vessel</b>	Single wall vessel (Dish bottom) with blanket						
	Total volume(Liter)	3L	5L	7L	10L	15L	20L
	Material	Borosilicate glass / 316L ss for headplate and all fittings					
		4	7	9.3	13.4	16.5	23
<b>Control unit</b>	Control panel	10.4" Color Touch screen Interface					
	Communication port	Remote control through Ethernet (SCADA)					
	Storage Program	Up to 59,994 program for different kinds of condition					
	Data storage	Up to 10 data files					
	Data storage interface	USB port					
	Cabinet material	ABS front panel and iron painted housing					
	Dimension	Footprint: 400 x 500 mm (W x D) ; Height: 740 mm					
<b>Aeration</b>	Rated voltage	110V or 220V ; 50/60 Hz					
	Inlet Gas Flow-meter	1 – 10 LPM		2 – 20 LPM		5 – 50 LPM	
	Impeller	Two different type of impeller – a. 3 pcs of adjustable Rushton-type impeller b. 2 pcs of adjustable Pitched-blade impeller note: 1. Rushton-type impeller is for cell line that are not considered shear-sensitive 2. Pitched-blade impeller for shear-sensitive cell line 3. The standard system includes one type impeller. It is option for another type. It is available for customer-made impeller).					
	Sparger	Orifice ring					
<b>Temperature</b>	Baffle	Removable 316L stainless steel baffles					
	Heating	Heating blanket					
	Cooling	Cooling coil (Internal heat exchanger); The finger heat exchanger is for 3L vessel.					
	Range	5°C above coolant up to 60°C					
	Probe	Platinum RTD probe (Pt 100);					
<b>Agitation</b>	Control mode	PID controller for one point or up to 15 steps programmable control.					
	Drive	Removable Top brushless motor					
	Speed Range	Two type of agitation motor : a. 30 – 1200 rpm is for general fermentor; b. 5 – 300 rpm is for shear-sensitive cell line (optional)					
<b>pH</b>	Control mode	PID controller for one point or up to 15 steps programmable control.					
	Range / Probe	2-12 pH / Gel-filled electrode; Autoclavable					
<b>DO</b>	Control mode	One point control					
	Range / Probe	0 – 200% / Polarographic DO sensor; Autoclavable					
<b>ORP</b>	Control mode	PID; Cascade function to response to a. Stepping increasing or decreasing agitation speed b. Oxygen Enrichment Device (optional) c. To start substrate feeding program.					
	Transmitter	-/+ 2000 mV					
<b>Foam</b>	Probe	Gel-filled electrode; Autoclavable (optional)					
	Probe	316L stainless steel protector with insulated Teflon tube; On/Off controller					
<b>Peristaltic pump</b>		Built-in 4 sets of pumps; One external pump (optional)					
		Precise Stepping motor; min. speed is 1 rpm					
	Speed range	0 – 65 rpm					
<b>Exhaust</b>	Control mode	Programmable 15 steps feeding control; Pump can be assigned for Acid, Base, Antifoam and Substrate					
		316L Stainless steel condenser					

### Optional Item:

1. Low Speed Agitation Driver : 5 ~ 300 rpm
2. Oxygen Enrichment Device
3. One external pump  
Specification :  
- Model # : MU-D01  
- Rpm and increment : 20 ~ 300 rpm ; 1 rpm  
- Motor Type : Brush-less motor  
- Number of roller : 1
4. ORP probe : Gel-filled electrode; Autoclavable

### Utility Requirement:

1. Building main supply 110V- 60 Hz or 220V - 50 Hz with electrical safety cutoff switch.
2. Autoclave for sterilization.
3. Cooling Circulating Water Bath for cooling purpose.
4. Compressor Air to supply air, which comes with a reducer to control pressure to around 1 kg/cm<sup>2</sup>. This air is to be dry, oil-free and filtered.
5. Computer for remote control.

Thermostat system (Jacket vessel type)					
<b>Vessel</b>	Jacket vessel (Dish bottom)				
	Total volume(Liter)	3L	5L	7L	10L
		4	7	9.3	13.4
	Material	Borosilicate glass / 316L ss for headplate and all fittings			
<b>Control unit</b>	Control panel	10.4" Color Touch screen Interface			
	Communication port	Remote control through Ethernet (SCADA)			
	Storage Program	Up to 59,994 program for different kinds of condition			
	Data storage	Up to 10 data files			
	Data storage interface	USB port			
	Cabinet material	ABS front panel and iron painted housing			
	Dimension	Footprint: 400 x 500 mm (W x D) ; Height: 735 mm			
<b>Aeration</b>	Rated voltage	110V or 220V ; 50/60 Hz			
	Inlet Gas Flow-meter	1 – 10 LPM	2 – 20 LPM		
	Impeller	Two different type of impeller – a. 3 pcs of adjustable Rushton-type impeller b. 2 pcs of adjustable Pitched-blade impeller note: 1. Rushton-type impeller is for cell line that are not considered shear-sensitive 2. Pitched-blade impeller for shear-sensitive cell line 3. The standard system includes one type impeller. It is option for another type. It is available for customer-made impeller).			
<b>Temperature</b>	Sparger	Orifice ring			
	Baffle	Removable 316L stainless steel baffles			
	Control system	Thermostat system; Built-in heat exchanger (400 W heater/water circulation pump); Automatic cooling water valve			
	Range	5°C above coolant up to 60°C			
<b>Agitation</b>	Probe	Platinum RTD probe (Pt 100)			
	Control mode	Programmable 15 steps PID controller			
	Drive	Removable Top brushless motor			
<b>pH</b>	Speed Range	Two type of agitation motor: a. 30 – 1200 rpm is for general fermentor; b. 5 – 300 rpm is for shear-sensitive cell line (The standard system includes one type of agitation motor. It is option for another type.)			
	Control mode	Programmable 15 steps PID controller			
<b>DO</b>	Range / Probe	2-12 pH / Gel-filled electrode; Autoclavable			
	Control mode	PID			
<b>Foam</b>	Range / Probe	0 – 200% / Polarographic DO sensor; Autoclavable			
	Control mode	PID; Cascade function to response to a. Stepping increasing or decreasing agitation speed b. Oxygen Enrichment Device (optional item) c. To start substrate feeding program.			
<b>Peristaltic pump</b>	Probe	316L stainless steel protector with insulated Teflon tube; On/Off controller			
		Built-in 4 sets of pumps; One external pump (optional)			
		Precise Stepping motor; min. speed is 1 rpm			
<b>Exhaust</b>	Speed range	0 – 100 rpm			
	Control mode	Programmable 15 steps feeding control; Pump can be assigned for Acid, Base, Anti foam and Substrate			


**Optional Item:**

1. Low Speed Agitation Driver : 5 ~ 300 rpm
2. Oxygen Enrichment Device
3. One external pump  
Specification :  
- Model # : MU-D01  
- Rpm and increment : 20 ~ 300 rpm ; 1 rpm  
- Motor Type : Brush-less motor  
- Number of roller : 1
4. ORP probe : Gel-filled electrode; Autoclavable

**Utility Requirement:**

1. Building main supply 110V- 60 Hz or 220V - 50 Hz with electrical safety cutoff switch.
2. Autoclave for sterilization.
3. Cooling Circulating Water Bath for cooling purpose.
4. Compressor Air to supply air, which comes with a reducer to control pressure to around 1 kg/cm<sup>2</sup>. This air is to be dry, oil-free and filtered.
5. Computer for remote control.

# F FERMENTORS


Thermostat system (Dish bottom type vessel)				
<b>Vessel</b>	Single wall vessel (Dish bottom)			
		3L	5L	7L
	Total volume(Liter)	4	7	9.3
	Material	Borosilicate glass / 316L ss for headplate and all fittings		
<b>Control unit</b>	Control panel	10.4" Color Touch screen Interface		
	Communication port	Remote control through Ethernet (SCADA)		
	Storage Program	Up to 59,994 program for different kinds of condition		
	Data storage	Up to 10 data files		
	Data storage interface	USB port		
	Cabinet material	ABS front panel and iron painted housing		
	Dimension	Footprint: 400 x 500 mm (W x D) ; Height: 740 mm		
	Rated voltage	110V or 220V ; 50/60 Hz		
<b>Aeration</b>	Inlet Gas Flow-meter	1 – 10 LPM	2 – 20 LPM	
	Impeller	Two different type of impeller – a. 3 pcs of adjustable Rushton-type impeller b. 2 pcs of adjustable Pitched-blade impeller note: 1. Rushton-type impeller is for cell line that are not considered shear-sensitive 2. Pitched-blade impeller for shear-sensitive cell line 3. The standard system includes one type impeller. It is option for another type. It is available for customer-made impeller).		
	Sparger	Orifice ring		
	Baffle	Removable 316L stainless steel baffles		
<b>Temperature</b>	Control system	Thermostat system; Built-in heat exchanger(400 W heater/water circulation pump); Automatic cooling water valve		
	Range	5°C above coolant up to 60°C		
	Probe	Platinum RTD probe (Pt 100);		
	Control mode	Programmable 15 steps PID controller		
<b>Agitation</b>	Drive	Removable Top brushless motor		
	Speed Range	Two type of agitation motor : a. 30 – 1200 rpm is for general Fermentor; b. 5 – 300 rpm is for shear-sensitive cell line (optional)		
<b>pH</b>	Control mode	Programmable 15 steps PID controller		
	Range / Probe	2-12 pH / Gel-filled electrode; Autoclavable		
<b>DO</b>	Control mode	One point control		
	Range / Probe	0 – 200% / Polarographic DO sensor; Autoclavable		
<b>ORP</b>	Transmitter / Probe	-/+ 2000 mV / Gel-filled electrode; Autoclavable (optional)		
<b>Foam</b>	Probe	316L stainless steel protector with insulated Teflon tube; On/Off controller		
<b>Peristaltic pump</b>	Four built-in Easy tube loading pumps; One external pump (Optional)			
	Precise Stepping motor; min. speed is 1 rpm			
	Speed range	0 – 65 rpm		
<b>Exhaust</b>	Control mode	Programmable 15 steps feeding control; Pump can be assigned for Acid, Base, Anti foam and Substrate		
	316L Stainless steel condenser			

### Optional Item:

1. Low Speed Agitation Driver : 5 ~ 300 rpm
2. Oxygen Enrichment Device
3. One external pump  
Specification :  
- Model # : MU-D01  
- Rpm and increment : 20 ~ 300 rpm ; 1 rpm  
- Motor Type : Brush-less motor  
- Number of roller : 1
4. Fluorescent Lamp control - Included 4 sets of T5 Fluorescent Lamp and a external Timer on/off control (24 hr)
5. ORP probe : Gel-filled electrode; Autoclavable

### Utility Requirement:

1. Building main supply 110V- 60 Hz or 220V - 50 Hz with electrical safety cutoff switch.
2. Autoclave for sterilization.
3. Cooling Circulating Water Bath for cooling purpose.
4. Compressor Air to supply air, which comes with a reducer to control pressure to around 1 kg/cm<sup>2</sup>. This air is to be dry, oil-free and filtered.
5. Computer for remote control.

Thermostat system (Jacket vessel type)		
<b>Vessel</b>	Jacket vessel (Dish bottom)	
	Type	Jacket Single wall (No temp. control system)
	Max. working volume	6.6 Liter
	Total volume	6.6 Liter
	Material	Borosilicate glass / 316L ss for headplate and all fittings
<b>Control unit</b>	Control panel	10.4" Color Touch screen Interface
	Communication port	Remote control through Ethernet (SCADA)
	Storage Program	Up to 59,994 program for different kinds of condition
	Data storage	Up to 10 data files
	Data storage interface	USB port
	Cabinet material	ABS front panel and iron painted housing
	Dimension	Footprint: 400 x 500 mm (W x D) ; Height: 740 mm
	Rated voltage	110V or 220V ; 50/60 Hz
<b>Aeration</b>	Inlet Gas Flow-meter	1 – 10 LPM
	Tube	Adjustable draft tube
	Sparger	Micro-sparger
<b>Temperature</b>	Control system	Thermostat system; Built-in heat exchanger (400 W heater/water circulation pump); Automatic cooling water valve
	Range	5°C above coolant up to 60°C
	Probe	Platinum RTD probe (Pt 100)
	Control mode	Programmable 15 steps PID controller
<b>pH</b>	Range / Probe	2-12 pH / Gel-filled electrode; Autoclavable
	Control mode	One point control
<b>DO</b>	Range / Probe	0 – 200% / Polarographic DO sensor; Autoclavable
	Control mode	PID; Cascade function to response to a. Stepping increasing or decreasing agitation speed b. Oxygen Enrichment Device (optional item) c. To start substrate feeding program.
<b>ORP</b>	Transmitter	-/+ 2000 mV
	Probe	Gel-filled electrode; Autoclavable (optional)
<b>Foam</b>	Probe	316L stainless steel protector with insulated Teflon tube; On/Off controller
<b>Peristaltic pump</b>	Four built-in Easy tube loading pumps; One external pump (optional)	
	Precise Stepping motor; min. speed is 1 rpm	
	Speed range	0 – 65 rpm
	Control mode	Programmable 15 steps feeding control; Pump can be assigned for Acid, Base, Anti foam and Substrate
<b>Exhaust</b>	316L Stainless steel condenser	

**Optional Item:**

1. Low Speed Agitation Driver : 5 ~ 300 rpm
2. Oxygen Enrichment Device
3. One external pump  
Specification :  
- Model # : MU-D01  
- Rpm and increment : 20 ~ 300 rpm ; 1 rpm  
- Motor Type : Brush-less motor  
- Number of roller : 1
4. ORP probe : Gel-filled electrode; Autoclavable

**Utility Requirement:**

1. Building main supply 110V- 60 Hz or 220V - 50 Hz with electrical safety cutoff switch.
2. Autoclave for sterilization.
3. Cooling Circulating Water Bath for cooling purpose.
4. Compressor Air to supply air, which comes with a reducer to control pressure to around 1 kg/cm<sup>2</sup>. This air is to be dry, oil-free and filtered.
5. Computer for remote control.



### VP-17-LF 30/VP-17-LF 30-SS/VP-17-LF 32/CVP-14-300A, Vacuum Filtration System

#### Features:

- **No air pollution, maintenance free**  
All pumps are driven by Piston, no need for lubricant, regular oil changes and maintenance; with no oil pollution.
- **The patented spin-lock design**  
The filter holder and waste bottle use a patented spin-lock connection giving a fast and stable installation without clamp.
- **Overflow protection**  
Waste bottle built in spill-proof buoy to keep the filtrate from overflowing when waste bottle is full.

#### Applications:

- VP-17-LF 30 is ideal for general filtration in laboratory
- VP-17-LF 30-SS is ideal for Suspended solid test.
- VP-17-LF 32 is ideal for filtration requiring the sterilization such as microbiology test.
- CVP-17-300A is ideal for the sample pretreatment of HPLC, GC, AA etc. In microanalysis or the purification of solvents etc.

Model	VP-17-LF 30		VP-17-LF 30-SS	
<b>Voltage</b>	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
<b>Max. flow rate</b>	21 l/min	18 l/min	21 l/min	18 l/min
<b>Max. vacuum</b>	670 mmHg (89.3 kPa) (120 mbar)			
<b>Capacity (Funnel/Waste bottle)</b>	300ml/1200ml			
<b>Filter diameter</b>	47mm/50mm			
<b>Effective filtration area</b>	12.5 cm <sup>2</sup>			
<b>Port thread</b>	8mm			
<b>Fitting part</b>	Material			
<b>Filter funnel</b>	PES			
<b>Waste bottle</b>	PES			
<b>Funnel support base</b>	PP			
<b>Funnel lid</b>	PP			
<b>Spill-proof buoy</b>	PP			
<b>Filter</b>	-		Glass Fiber	

Model	VP-17-LF 32		CVP-14-300A	
<b>Voltage</b>	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
<b>Max. flow rate</b>	21 l/min	18 l/min	20 l/min	20 l/min
<b>Max. vacuum</b>	670 mmHg (89.3 kPa) (120 mbar)			
<b>Capacity (Funnel/Receiver flask)</b>	300ml/1200ml		300ml/1000ml	
<b>Filter diameter</b>	47mm/50mm		47mm	
<b>Effective filtration area</b>	12.5 cm <sup>2</sup>		9.6 cm <sup>2</sup>	
<b>Port thread</b>	8mm			
<b>Fitting part</b>	Material			
<b>Filter funnel</b>	SUS316	Borosilicate glass		
<b>Receiver flask</b>	PES	Borosilicate glass		
<b>Funnel support base</b>	SUS316	Borosilicate glass		
<b>Clamp</b>	-	Anodized aluminum		
<b>Spill-proof buoy</b>	PP	-		
<b>Filter</b>	MCE	-		





**BSU-34-LF 30 / BSU-34-LF 32,  
Vacuum Filtration System**

**Features:**

- **compact and safe operation**  
BSU-34 is a unique suction system by combining vacuum source with filtration ware. Its compact design can save more bench space than other traditional models. With a fence-like platform design, it can prevent user's negligence from tipping over the suction bottle.
- **The patented spin-lock design**  
The filter holder and waste bottle use a patented spin-lock connection giving a fast and stable installation without clamp.
- **Overflow protection**  
Waste bottle built in spill-proof buoy to keep the filtrate from overflowing when waste bottle is full.
- **PES plastic injection** (Polyethersulfone)  
Waste bottle is made of PES which are autoclavable, shatterproof and high temperature (180°C) resistance and steam autoclavable.

**Applications:**

- Filtration for microbiology test
- Suspended solid test
- Vacuum filtration.

Model	BSU-34-LF 30		BSU-34-LF 32	
<b>Voltage</b>	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
<b>Max. power (W)</b>	100	80	100	80
<b>Max. current (A)</b>	1.0	0.4	1.0	0.4
<b>Max. vacuum</b>	720 mmHg (95.9 kPa) (53.3 mbar)			
<b>Max. flow rate</b>	37 l/min	34 l/min	37 l/min	34 l/min
<b>Motor rotation</b>	1750 RPM	1450 RPM	1750 RPM	1450 RPM
<b>Port thread</b>	8mm			
<b>Fitting part</b>	Material			
<b>Filter funnel</b>	PES (300ml, 47mm/50mm)		SUS316 (100ml,47mm/50mm)	
<b>Waste bottle</b>	PES (1200ml)			
<b>Funnel support base</b>	PP (Containing PTFE syringe filter, 25mm, 0.2µm)		SUS316	
<b>Funnel lid</b>	PP		-	
<b>Spill-proof buoy</b>	Yes			

**Ordering Information****167103-23**

MANF-330, 3 Places Stainless Steel Manifold (without SS funnel).

**167103-26**

MANF-630, 6 Places Stainless Steel Manifold (without SS funnel).

**167103-24**

MANF-331, 3 Places Stainless Steel Manifold Set (Includes 3 pcs of 100ml SS funnel).

**167103-27**

MANF-631, 6 Places Stainless Steel Manifold Set (Includes 6 pcs of 100ml SS funnel).

**Optional Funnel:****167103-61**

100ml S.S Funnel

**167103-63**

300ml S.S Funnel

**167103-65**

500ml S.S Funnel

**MANF-330/630/600/300, Multi-Branch S.S Manifold****Features:**

- **The whole set is made of SUS316**

All parts of MANF-300/600/330/630 manifold are made of SUS316, which offer excellent chemical resistance and can be sterilized by flame, steam and oven etc.

- **The patented spin-lock design**

The manifold uses a patented spin-lock connection which facilitates fast and stable installation without clamp.

- **Individual control valve**

Each branch permits individual control.

- **Compatible to different size of funnels**

MANF-330/630 manifolds are available to fit 100, 300, 500ml funnel optionally.

MANF-300/600 manifolds are available to fit 500, 750, 1000ml funnel optionally.

**Applications:**

- Filtration for microbiology test
- Chemical experiment
- General liquid filtration .

**Optional Funnel:****167102-50**

500ml S.S Funnel

**167102-75**

750ml S.S Funnel

**167102-99**

1000ml S.S Funnel

**167110-20**

S.S Cover (Available to fit above-mentioned funnels).

**MANF-300 With S.S Funnel+Cover**

Model	MANF-330	MANF-630	MANF-300	MANF-600
Number of branch	3	6	3	6
Filter diameter	47mm/50mm	47mm/50mm	47mm/50mm	47mm/50mm
Funnel capacity	100ml/300ml/500ml	100ml/300ml/500ml	500ml/750ml/1000ml	500ml/750ml/1000ml
Effective filtration area	9.6cm <sup>2</sup>	9.6cm <sup>2</sup>	9.6cm <sup>2</sup>	9.6cm <sup>2</sup>
Port thread	8mm	8mm	8mm	8mm
Dimension (LxWxH) mm	44.5x12.9x12.5	68.5x12.9x12.5	43.5x15x14.5	67.5x15x14.5
Fitting part	Material	Material	Material	Material
Body	SUS316	SUS316	SUS316	SUS316
Control valve	SUS316	SUS316	SUS316	SUS316
Filter funnel	SUS316	SUS316	SUS316	SUS316
Funnel support base	SUS316	SUS316	SUS316	SUS316
Handle	SUS316	SUS316	SUS316	SUS316
Connector	SUS316	SUS316	SUS316	SUS316



### MANF-320/620/321, Multi-Branch S.S Manifold

#### Features:

- **The whole set is made of SUS316**  
All parts of MANF-320/620 manifold are made of SUS316, which offer excellent chemical resistance and can be fastly sterilized by flame, steam and oven etc.
- **Light and practical aluminum design**  
MANF-321 is made of anodized aluminum and plated copper that make it light, cost effective and autoclavable.
- **Individual control valve**  
Each branch permits individual control.
- **Compatible to different size of funnels**  
MANF-320/620/321 manifolds use no.8 stopper which is available to fit various filter holder optionally.

#### Applications:

- Filtration for microbiology test
- Chemical experiment
- General liquid filtration.

#### Options:

**197000-01**  
LF3, 300ml PES Filter Holder

**167110-16**  
No.8 Silicon Stopper.



**MANF-320**  
With 197100-1 & 167110-16

#### Ordering Information:

**167110-23**

MANF-320, 3 places Stainless Steel Manifold

**167110-26**

MANF-620, 6 places Stainless Steel Manifold

**167200-43**

MANF-321, 3 places Aluminium Manifold

Model	MANF-320	MANF-620	MANF-321
<b>Number of branch</b>	3	6	3
<b>Filter diameter</b>	According to filter holder	According to filter holder	According to filter holder
<b>Funnel capacity</b>	According to filter holder	According to filter holder	According to filter holder
<b>Effective filtration area</b>	According to filter holder	According to filter holder	According to filter holder
<b>Port thread</b>	8mm	8mm	8mm
<b>Dimension (LxWxH) mm</b>	44.5x12.9x15	68.5x12.9x15	39.5x15x13.7
<b>Fitting part</b>	Material	Material	Material
<b>Body</b>	SUS316	SUS316	Anodized aluminum
<b>Control valve</b>	SUS316	SUS316	Plated copper
<b>Handle</b>	SUS316	SUS316	Anodized aluminum
<b>Connector</b>	SUS316	SUS316	Plated copper



### MANF-330B/630B, Vacuum Filtration Systems

#### Features:

- **Special design for microbiology filtration**  
MANF-330B/630B is designed for rapid batch filtration of microbiology test. Each system includes vacuum pump, burner, waste bottle and filter.
- **The manifold is made of SUS316**  
All parts of manifold are made of SUS316 which offer excellent chemical resistance and can be fastly sterilized by flame, steam and oven etc.
- **The patented spin-lock design**  
The manifold uses a patented spin-lock connection which facilitates fast and stable installation without clamp.

#### Applications:

- Filtration for microbiology test
- Chemical experiment
- General liquid filtration.

#### Ordering Information

##### 167403-11 (22)

MANF-330B vacuum filtration system, complete set includes:

- VP-34 Oil Free Vacuum Pump
- MANF-331, 3 Places Stainless Steel Manifold Set
- 3000ml PC waste bottle
- STER-100 Torch Burner
- MCE Membrane, 47mm, 0.45 $\mu$ m, 200/PK
- Silicon Tube (2m).

##### 167601-11(22)

MANF-630B vacuum filtration system, complete set includes:

- VP-58 Oil Free Vacuum Pump
- MANF-631, 6 Places Stainless Steel Manifold Set
- 3000ml PC waste bottle
- STER-100 Torch Burner
- MCE Membrane, 47mm, 0.45 $\mu$ m, 200/PK
- Silicon Tube (2m).

Model	MANF-330B	MANF-630B
Max. flow rate	37 l/min	60 l/min
Max. vacuum	670 mmHg (89.3 kPa) (120 mbar)	
Receiver flask	3000ml (made of PC)	
Number of branch	3	6
Filter diameter	47mm/50mm	
Funnel Capacity	100ml	
Effective filtration area	9.6 cm <sup>2</sup>	
Port thread	8mm	
Fitting part	Material	
Filter funnel	SUS316	
Control valve	SUS316	
Funnel support base	SUS316	
Handle	SUS316	
Connector	SUS316	

**MVM-210, Microplate Vacuum Manifold with Vacuum Pump**

**Features:**

- **One system meeting full needs**  
Coupling with a vacuum pump, MVM-210 can be a complete set of vacuum purification system including VP-17 oil-free vacuum pump, silicone tube, waste tray, disc filter (prevent waste liquid from overflowing into pump). The optional PES waste bottle can use as a good alternative to collect high volume of waste when used with large-volume centrifuge tubes.
- **Quiet and no air pollution**  
MVM-210 adopts VP-17 oil-free vacuum pump with low noise, adjustable vacuum & no air pollution.

**Applications:**

- DNA Purification • RNA Purification
- Gel Purification • PCR Clean Up.

**Ordering Information**

**195210-11(22)**

MVM-210 microplate vacuum manifold system, AC110V, 60Hz (AC220V, 50Hz), complete set includes:

- VP-17 vacuum pump.
- MVM-200 microplate vacuum manifold.
- Disc filter.
- Silicone tube (30cm).

**197000-12** 1200ml Waste bottle (optional).

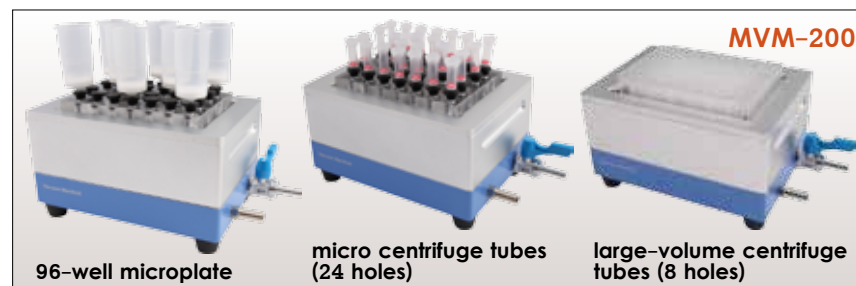


Model	MVM-210
<b>Max. vacuum</b>	670 mmHg (adjustable)
<b>Max. flow</b>	21 l/min
<b>Noise level</b>	50 dB
<b>Waste bottle</b>	1200 ml (with overflow protection device)
<b>Waste bottle material</b>	RES
<b>Port thread</b>	8 mm
<b>Disc filter material</b>	PTFE
<b>Disc filter specification</b>	035mm, 0.2 μm

**MVM-200, Microplate Vacuum Manifold**

**Features:**

- **Simplifying operation**  
MVM-200 is designed to replace traditional centrifuges with vacuum source to simplify purification process of plasmid DNA, single-stranded phage DNA, RNA, genomics DNA, viral nucleic acids from PCR and other enzymatic reactions.
- **Time-saving**  
By connecting manifold to vacuum source, the system can give a rapid continuous separation without dispensing solution, running and stopping centrifuge.
- **Multi-use of one machine**  
Unique designed column adapter board and luer connector make MVM-200 highly compatible with various kinds of centrifuge tube and 96-well microplate.



Model	MVM-200
<b>Vacuum manifold material</b>	Anodized aluminum
<b>Gasket material</b>	Rubber
<b>O-ring material</b>	Rubber
<b>Column adapter board material</b>	PC (polycarbonate)
<b>Luer connector material</b>	Silicon rubber
<b>Luer stopper material</b>	Silicon rubber
<b>Port thread</b>	8 mm
<b>Manifold internal dim. (mm)</b>	128(L)x86(W)x73(H)
<b>Manifold external dim. (mm)</b>	232(L)x124(W)x102(H)
<b>NW/OW.</b>	2.6kg / 3kg

**Ordering Information**

**195200-00** MVM-200 microplate vacuum manifold, complete set includes the following 4 fitting parts:

**195200-42** Spin column adapter board (24 hole).

**195200-43** Luer connector (251pk).

**195200-44** stopper (25/pk).

**195200-45** Waste tray.

**195200-00**

**MVM-200**



### VF5/VF8, 25 mm Glass Microanalysis Filtration Sets



**Applications:** Ideal for small volume vacuum filtration for biological analysis or particulate contamination analysis.

Material	VF5	VF8
Filter funnel	Borosilicate glass	
Funnel support base	Borosilicate glass	
Membrane support	Sintered glass	S.S. screen with PTFE seal
Clamp	Anodized aluminum	
Stopper	Silicon rubber (No.5)	
Receiver flask	Borosilicate glass	
Specifications	VF5	VF8
Funnel capacity	15ml	
Flask capacity	125ml	
Filter diameter	25mm	
Effective filtration area	2.2cm <sup>2</sup>	
Port thread (I.D. tubing)	8mm	

### VF6/VF7, 47 mm Glass Filtration Sets



**Applications:** Ideal for solvent purification and general filtration for microbiology, suspended solid analysis etc.

Material	VF6	VF7
Filter funnel	Borosilicate glass	
Funnel support base	Borosilicate glass	
Membrane support	Sintered glass	S.S. screen with PTFE seal
Clamp	Anodized aluminum	
Stopper	Silicon rubber (No.8)	
Receiver flask	Borosilicate glass	
Specifications	VF6	VF7
Funnel capacity	300ml	
Flask capacity	1000ml	
Filter diameter	47mm	
Effective filtration area	9.6cm <sup>2</sup>	
Port thread (I.D. tubing)	8mm	

### VF3/VF10, 47 mm, 90 mm Glass Filtration Sets



**Applications:** Ideal for the purification of organic, corrosive liquid such as solvent (mobile ph for HPLC analysis).

Material	VF3	VF10
Filter funnel	Borosilicate glass	
Funnel support base	Borosilicate glass	
Membrane support	Sintered glass	S.S. screen with PTFE seal
Clamp	Anodized aluminum	
Receiver flask	Borosilicate glass	
Specifications	VF3	VF10
Funnel capacity	300ml	1000ml
Flask capacity	1000ml	4000ml
Filter diameter	47mm	90mm
Effective filtration area	9.6cm <sup>2</sup>	40.6cm <sup>2</sup>
Port thread (I.D. tubing)	8mm	

**LF30/LF31, 47mm PES (Polyethersulfone) Filtration Sets**



**Features:**

- Spin-lock connection facilitates fast and stable installation without clamp
- PES structure offers excellent smash and high temperature (180°C) resistance and autoclavable
- Waste bottle built in spill-proof buoy to keep the filtrate from overflowing when waste bottle is full
- LF31 is designed to have a outlet fitting for fast draining
- Funnel graduated in 50ml, receiver in 100ml increments for easy measurement.

Material	LF30	LF31
<b>Filter funnel</b>	PES	
<b>Funnel support base</b>	Borosilicate glass	
<b>Membrane support</b>	PP	
<b>Syringe filter</b>	PTFE	
<b>Receiver flask</b>	PES	Borosilicate glass
<b>Specifications</b>	<b>LF30</b>	<b>LF31</b>
<b>Funnel capacity</b>	300ml	
<b>Flask capacity</b>	1200ml	1000ml
<b>Filter diameter</b>	47 mm / 50 mm	
<b>Effective filtration area</b>	12.5cm <sup>2</sup>	
<b>Port thread (I.D. tubing)</b>	8mm	
<b>Syringe filter</b>	25 mm, 0.2 μm	
<b>Drain device</b>	-	Yes
<b>Spill-proof buoy set</b>	Yes	-

**VF2/VF11, 47 mm Stainless Steel Filtration Sets**



**Applications:** For filtration requiring the sterilization such as microbiology test or use for purification of corrosive liquid, solvent etc.

Material	VF2	VF11
<b>Filter funnel</b>	SUS316	
<b>Funnel support base</b>	SUS316	
<b>Membrane support</b>	SUS316	
<b>Stopper</b>	Silicon rubber (No.16)	
<b>Receiver flask</b>	Borosilicate glass	
<b>Specifications</b>	<b>VF2</b>	<b>VF11</b>
<b>Funnel capacity</b>	100ml	500ml
<b>Flask capacity</b>	1000ml	2000ml
<b>Filter diameter</b>	47mm	
<b>Effective filtration area</b>	9.6cm <sup>2</sup>	
<b>Port thread (I.D. tubing)</b>	8mm	

**LF32/LF33, 47 mm Stainless Steel Filtration Sets**



**Features:**

- Spin-lock connection facilitates fast and stable installation without clamp
- Stainless steel funnel offers excellent chemical resistance and can be sterilized by flame
- Waste bottle built in spill-proof buoy to keep the filtrate from overflowing when waste bottle is full.

Material	LF32	LF33
<b>Filter funnel</b>	SUS316	
<b>Funnel support base</b>	SUS316	
<b>Membrane support</b>	SUS316	
<b>Waste bottle</b>	PES	
<b>Specifications</b>	<b>LF32</b>	<b>LF33</b>
<b>Funnel capacity</b>	100ml	300ml
<b>Flask capacity</b>	1200ml	
<b>Filter diameter</b>	47mm / 50mm	
<b>Effective filtration area</b>	9.6cm <sup>2</sup>	
<b>Port thread (I.D. tubing)</b>	8mm	
<b>Funnel graduation</b>	50 ml	100 ml

**LF3/LF3A, 47mm PES (Polyethersulfone) Filter Holder**



**Features:**

- Spin-lock connection facilitates fast and stable installation without clamp
- PES structure offers excellent smash and high temperature (180°C) resistance and autoclavable
- Reusable, friendly to the earth and saves your money
- Funnel graduated in 50ml increments for easy measurement
- LF3 equips with No.16 stopper that allows it to fit other receiver flasks
- LF3A is available to fit different tissue bottle.

Material	LF3	LF3A
Filter funnel	PES	
Funnel support base	PES	
Membrane support	PP	
Funnel cover	PP	
Cap of lid	Silicon	
Syringe filter	PTFE	
Specifications	LF3	LF3A
Funnel capacity	300ml	
Filter diameter	47mm / 50mm	
Effective filtration area	12.5cm <sup>2</sup>	
Syringe filter	25mm, 0.2µm	
Lid inlet fitting	Female luer slip	



**167103-10/30/50, 47mm Stainless Steel Filter Holders**

**Features:**

- Spin-lock connection facilitates fast and stable installation without clamp
- Stainless steel funnel offers excellent chemical resistance and can be sterilized by flame.

Material	167103-10	167103-30	167103-50
Filter funnel	SUS316		
Funnel support base	SUS316		
Membrane support	SUS316		
Funnel lid	SUS316		
Specifications	167103-10	167103-30	167103-50
Funnel capacity	100ml	300ml	500ml
Filter diameter	47mm / 50mm		
Effective filtration area	9.6cm <sup>2</sup>		



**167120-31/33, 47mm Glass Filter Holders**


**Features:**

- Borosilicate glass offers excellent chemical resistance
- High temperature resistance, steam autoclavable.

Material	167120-31	167120-33
Filter funnel	Borosilicate glass	
Funnel support base	Borosilicate glass	
Membrane support	Sintered glass	S.S screen with PTFE seal
Clamp	Anodized aluminum	
Specifications	167120-31	167120-33
Funnel capacity	300ml	
Filter diameter	47mm	
Effective filtration area	9.6cm <sup>2</sup>	




197000-11, PES waste bottle

	Specifications	Capacity	1200ml
		Port thread(I.D. tubing)	8mm
		Graduated increment	100ml
		Spill-proof buoy	Yes
		Waste bottle cover	Yes
		Compatible Stopper	No.16
	Material	Container	PES
		Cover	PES
		Spill-proof buoy	PP
		Stopper	Silicon


197000-11

197000-12, PES waste bottle

	Specifications	Capacity	1200ml
		Port thread(I.D. tubing)	5mm
		Graduated increment	100ml
		Spill-proof buoy	Yes
	Material	Container	PES
		Cover	PES
		Spill-proof buoy	PP


197000-12

197000-13, Suction / Pressure bottle

	Specifications	Capacity	1200ml
		Port thread(I.D. tubing)	5mm
		Graduated increment	100ml
		Overpressure protection	Yes
	Material	Container	PES
Cover		PES	


197000-13

167200-33, PC waste bottle

	Specifications	Capacity	3000ml
		Port thread(I.D. tubing)	8mm
		Graduated increment	100ml
		Spill-proof buoy	Yes
	Material	Container	PC
		Cover	PC
	Spill-proof buoy	PP	


167200-33

197000-36, PP funnel lid

	Specifications	Compatible funnel	300ml PES funnel
		Vent	3
		Vent Fitting	Female luer slip
		Syringe filter	Ø25mm, 0.2µm
	Material	Body	PP
		Cap	Silicon
		Syringe filter	PTFE


197000-36

167200-34, Glass waste bottle

	Specifications	Capacity	4000ml
		Port thread(I.D. tubing)	8mm
		Graduated increment	100ml
		Spill-proof buoy	Yes
	Material	Container	Glass
		Cover	S.S
	Spill-proof buoy	PP	


167200-34

167100-20/52, Membrane filters

	167100-20 Glass fiber filter	Brand	Pall
		Filter diameter	47 mm
		Pore size	1µm
	167100-52 MCE filter	Brand	Pall
		Filter diameter	47 mm
		Pore size	0.45µm
	Material	MCE	


197100-20

167100-13, Glass flask with drain

	Specifications	Capacity	1000ml
		Port thread(I.D. tubing)	8mm
		Graduated increment	100ml
		Spill-proof buoy	Yes
	Material	Compatible Stopper	No.16
		Container	Borosilicate glass
		Connector	PP
	Stopper	Silicon	


167100-13

194225-01,167200-35/36, Syringe filters

	194225-01 Syringe filter	Brand	Pall
		Filter dia./ Pore size	25mm/0.2µm
		Shell diameter	30mm
		Filter material	PTFE
	167200-35 Small disc filter	Brand	Pall
		Filter dia./ Pore size	35mm/0.2µm
		Shell diameter	45mm
		Filter material	PTFE
	167200-36 Large disc filter	Brand	Pall
		Filter dia./ Pore size	50mm/0.2µm
		Shell diameter	72mm
		Filter material	PTFE
	Shell material	PP	

167200-35

167200-13, Glass flask with drain

	Specifications	Capacity	2000ml
		Port thread(I.D. tubing)	8mm
		Graduated increment	200ml
		Spill-proof buoy	Yes
	Material	Compatible Stopper	No.18
		Container	Borosilicate glass
		Connector	PP
	Stopper	Silicon	

167200-13

## FP-536D, Automatic COC Flash Point Tester



The instrument is designed and made as per the National Standard of People's Republic of China GB/T3536-2008 "Test Methods for Flash and Fire Point of Petroleum Products (Cleveland Open Cup Methods)". It is suitable to determine flash point and fire point of petroleum products having a flash point higher than 79 °C, excepting fuel oils.

Model	FP-536D
Power supply	AC 220 V±10%, 50 Hz
<b>Temperature measurement</b>	
Full scale	Ambient temperature to 400°C
Repeatability	≤ 4°C
Reproducibility	≤ 8°C
Resolution	0.1°C
Precision	0.5%
<b>Basic parameters</b>	
Temperature rising speed	as per GB/T3536
Ignition mode	by an electric flame (gas flame is 3 to 4 mm)
Ambient temperature	10~40°C
Relative humidity	≤ 80%
Total power consumption	not more than 400W

## FP-536A, Automatic Cleveland Open Cup Flash Point Tester



The instrument is designed and made as per the National Standard GB/T3536 "Test Methods for Flash Point and Fire Point of Petroleum Products (Cleveland Open Cup Methods)", and T0651 "Asphalt Flash Point and Fire Point Test (Cleveland Open Cup Methods)" in the Industry Standard 3-1\_1052 Specification and Test Methods of Bitumen and Bituminous Mixtures for Highway Engineering. It is used to determine flash point of petroleum products and bituminous materials, excepting fuel oil and materials having a flash point of lower than 79°C. The instrument is used to determine flash point of petroleum products. It has function of automatic program temperature controlling, LCD display, automatic barometric pressure calibration, and automatic modified value calibration. It can apply flame, ignite, detect & print out test data automatically. It is convenient and rapid. It is the best substitute product for imported one.

Model	FP-536A
Power supply	AC 220 V±10%, 50 Hz
<b>Temperature measurement</b>	
Full scale	Ambient temperature to 300°C
Repeatability	≤ 8°C
Reproducibility	≤ 16°C
Resolution	0.1°C
Precision	0.5%
<b>Basic parameters</b>	
Temperature rising speed	as per GB/T3536
Ignition mode	by an electric flame (gas flame is 3 to 4 mm)
Ambient temperature	10~40°C
Relative humidity	≤ 80%
Total power consumption	not more than 500W

## FP-26D, Automatic PMCC Flash Point Tester



This instrument is suitable to the standards of GB/T261. It uses the closed cup to test the flash point of liquid. Reference standard: 1502791, ASTM D93, IP34

Model	FP-26D
Power supply	AC 220 V±10%, 50 Hz
<b>Temperature measurement</b>	
Repeatability	≤ 2°C
Reproducibility	≤ 4°C
Resolution	0.1°C
Precision	0.5%
<b>Basic parameters</b>	
Temperature rising speed	as per GB/T261
Ignition mode	gas flame is 3-4mm
Ambient temperature	10~40°C
Relative humidity	≤ 8%
Total power consumption	not more than 300W

**FP-26A, Automatic PMCC Flash Point Tester**

FP-26A

Model	FP-26A
<b>Power supply</b>	AC 220 V±10%, 50 Hz
<b>Temperature measurement</b>	
<b>Measurement range</b>	ambient temperature -250°C
<b>Flash point</b>	lower than 104°C, error is 2°C higher than 104°C, error is 6°C
<b>Resolution</b>	0.1°C
<b>Precision</b>	0.5%
<b>Basic parameters</b>	
<b>Temperature rising rate</b>	as per GB/T261
<b>Ignition mode</b>	gas flame is 3-4mm
<b>Ambient temperature</b>	10~40°C
<b>Relative humidity</b>	≤ 80%
<b>Total power consumption</b>	not more than 350W

The instrument is designed and made as per GB/T261 "Test Methods for Flash Point of Petroleum Products (Closed Cup Methods)". It is used to determine the lowest temperature of a petroleum product sample when the mixture of sample vapor and air around the sample contacts flame and flashes when heated in a closed cup under stipulated condition. The lowest temperature is the flash point of the petroleum product sample. The instrument has function of automatic program temperature controlling, automatic barometric pressure modification, and modified value calculation. It can automatically control measurement procedures and test data, and it can also save, analyze and print out test data.

**FPT-5208, Rapid Low Temperature Closed Cup Flash Point Tester**

FPT-5208

Model	FPT-5208
<b>Power supply</b>	AC 220 V±10%, 50 Hz
<b>Measurement range</b>	-30°C~50°C
<b>Measurement accuracy</b>	
<b>Repeatability</b>	less than 2°C
<b>Reproducibility</b>	less than 2°C
<b>Temperature controlling accuracy</b>	±0.5°C
<b>Igniter</b>	an electron igniter
<b>Refrigeration type</b>	It uses semiconductor for refrigeration (It connects to outer cooling water)
<b>Total power consumption</b>	not more than 300 W
<b>Ambient temperature</b>	5~30°C
<b>Relative humidity</b>	30~80%
<b>Total power consumption</b>	not more than 350W

The instrument is designed and made as per the National Standard of People's Republic of China GB/T5208 "Test Methods for Flash Point (Rapid Equilibrium Closed Cup Method)". It can be used in the field of petroleum, chemistry, paints, railway, aviation, power plant, inspection, military, and scientific research to determine flash point of petroleum products rapidly.

The instrument is suitable to make closed cup flash point determination for paints, adhesives, solvents, petroleum, and relative petroleum products, the flash points of which are in the range of 30°C — 50°C. It can also meet the requirements of ISO 1523 and ISO 3679.





**Main technical characteristics**

- It is designed as per GB/T5208 (Test Methods for Flash Point (Rapid Equilibrium Closed Cup Method)". It can determine closed cup flash point at a low temperature rapidly.
- It adopts semiconductor refrigeration device and cooling water refrigeration device. It is small, convenient and with rapid refrigeration speed.
- It needs fewer samples. The sample for each test is only 2 ml (For solid or semisolid sample, it is 4 ml);
- The test can be automatically completed excepting flame ignition. The test data can be automatically printed.





# F FREEZE DRYERS Economy

Bench top freeze dry system offer an economical solution for processing light loads of aqueous samples specially designed for use by researchers small footprint simple operation.



## FDL-10N-50-Series, Bench Top Freeze Dryers

FDL-10N-50: 50°C Lyophilizer (freeze-dryer)				
	FDL-10N-50-BA	FDL-10N-50-8M	FDL-10N-50-TD	FDL-10N-50-TD-MM
Picture				
Freeze temperature	-50°C			
Vacuum degree	<15Pa			
Freeze-dry area	0.12 m <sup>2</sup>		0.07 m <sup>2</sup>	
Tray load	1.2L		0.7L	
Water capture	3kg/24h			
Sample tray	Φ200mm x4		Φ180mm x3	
Power supply	220V 50Hz 800W			
Machine size (mm)	L380xW500xH340			
Character	Big cold tray hole, with sample pre-freeze, stainless 304# cold tray, no pipe in cold tray, anti rust transparent plastic cover for dry chamber, security and direct-viewing stainless sample shelf, the distance between trays is adjustable international standard interface to pump.			

## FDL-10N-80-Series, Floor Freeze Dryers

FDL-10N-80: 80°C Lyophilizer (freeze-dryer)				
	FDL-10N-80-BA	FDL-10N-80-8M	FDL-10N-80-TD	FDL-10N-80-TD-MM
Picture				
Freeze temperature	-80°C			
Vacuum degree	<15Pa			
Freeze-dry area	0.12 m <sup>2</sup>		0.07 m <sup>2</sup>	
Tray load	1.2L		0.7L	
Water capture	3kg/24h	4kg/24h	3kg/24h	
Sample tray	Φ200mm x4 lays		Φ180mm x3 lays	
Power supply	220V 50Hz 800W	220V 50Hz 1300W	220V 50Hz 800W	
Machine size (mm)	L500xW500xH750	L492xW540xH800	L492xW500xH750	L500xW500xH750
Character	Big cold tray hole, with sample pre-freeze, stainless 304# cold tray, no pipe in cold tray, anti rust transparent plastic cover for dry chamber, security and direct-viewing stainless sample shelf, the distance between trays is adjustable international standard interface to pump.			

## FDL-10N-50/80T, Bench Top Freeze Dryers

FDL-10N-50 T type for multi-manifolds		
	FDL-10N-50T	FDL-10N-80T
Picture		
Brief	Basic components: 2L vacuum pump, 24pcs "T" shelf, 24pcs rubber valves. This type can be customized for your request	
Freeze temperature	-50°C	-80°C
Vacuum degree	<15Pa	
Water capture	3kg/24h	
Freeze-dry area	0.12m <sup>2</sup>	
Power supply	220V 50Hz 800W	
Machine size (mm)	L380xW500xH340	L500xW500xH750
Character	Big cold tray hole, with sample pre-freeze, stainless 304# cold tray, no pipe in cold tray, anti rust international standard interface to pump	

## FDL-18N-70-Series, Floor Freeze Dryers

FDL-18N-70: -70°C Lyophilizer (freeze-dryer)					
	FDL-18N-70-NH	FDL-18N-70-BA	FDL-18N-70-TD	FDL-18N-70-8M	FDL-18N-70-TD-MM
Heat	Without heating	Basic type	Top-down stoppering	Multi-manifolds (8 manifolds)	Top-down stoppering & Multi-manifolds
Heating function	No	Yes			
Freeze temperature	< -70°C				
Vacuum degree	<13Pa				
Freeze-dry area	0.27m <sup>2</sup>	0.18	0.11	0.18	0.11
Tray load capacity	2.7L	1.8L	1.1L	1.8L	1.1L
Water capture	6kg/24h				
Sample tray	Φ200mm x6	Φ200mm x4	Φ200mm x3	Φ200mm x4	Φ200mm x3
Power supply	220V 50Hz 1800W				
Machine size (mm)	L540xW640xH920				



## FD-Series, Professional Freeze Dryers

Automatic Programmable Control System: From drying to defrosting, user-friendly programmable controls enable you to start runs quickly & the microprocessor controls different ramping & holding segments to meet different temp. protocols. Heated Drying system: By programmable controlling temp. by forceful circulation of the heat medium of shelf inside, it obtain a further precise distribution of temperatures. Pre-freeze system: The chamber pre-freezes sample to save money and time, eliminating the need for a separate freezer and product transfer. Defrosting system: Automatically defrosting system is available for ice condenser when defrosting is necessary. Vacuum Backfilling System: As far as the permanent preservation of the sample desiccation is concerned it protects a sample by inserting sterile nitrogen gas with back filling system for preventing contamination of the sample. Safety stoppering System: For the purpose of permanent preservation of a sample after freeze of drying, the stopper system, which seals under a vacuum state, consists an option that installs moving guides shelves delicately & that has a function to seal safely & precisely using a rotating sealing device. Automatic Purge System, It is equipped with an automated purge system to protect samples by preventing of counter-flow of vacuum pump oil. Compressor delayed start function to minimize any damage to compressor. 1.5 km far remote control system.

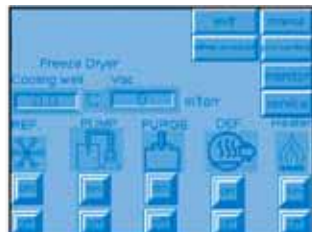
Model	FD5-3 FD8-3	FD5-4 FD8-4	FD5-5 FD8-5	FD5-6 FD8-6	FD5-8 FD8-8	FD5-10 FD8-10	FD5-12 FD8-12	FD5-15 FD8-15	FD5-19 FD8-19	FD5-25 FD8-25
Compressor (-58°C)	7/8HP	7/8HP	1HP	1HP	1HP	1.5HP	1.5HP	2HP	2HP	3HP
Compressor (-86°C)	2x7/8HP	2x7/8HP	2x1HP	2x1HP	2x1HP	2x1.5HP	2x1.5HP	2x2HP	2x2HP	2x3HP
Max. ice capacity	3L	4L	5L	6L	8L	10L	12L	15L	19L	25L
Ice condenser performance	2L/24h	3L/24h	3.5L/24h	4.5L/24h	5.5L/24h	8L/24h	10L/24h	12L/24h	14L/24h	20L/24h
Ice condenser Ult-temp	-58°C									
Ice condenser Ult-temp	-86°C									
Pump suction capacity	120L	120L	120L	120L	120L	200L	200L	200L	250L	340L
Controller	B T P									
Pump Ult-pressure	2x10 <sup>-4</sup> Torr									
Defrosting system	Hot gas solenoid system or heater defrosting system									
Gross weight	70/123	70/123	70/123	123	123	123	123	150	150	150
Bench-top/vertical electrical requirement	bench-top/vertical	bench-top/vertical	bench-top/vertical	vertical	vertical	vertical	vertical	vertical	vertical	vertical
	220V, 50/60Hz single phase									

### T-Controller

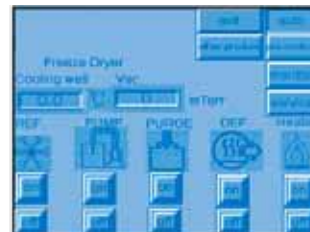
- 2 drying modes: automatic & manual.
- Automatic Purge System.
- Defrosting System.
- Compressor delayed start function to minimize any damage to compressor.
- It is equipped with an automatic purge system to protect samples by preventing of counter-flow of vacuum pump oil.
- Build-in computer and LCD touch screen program controls 5000 Memories.
- Monitoring system, monitoring vacuum pressure, ice condenser temperature and sample temperature.
- Documentation system, data saves per minute, continue 730 days and 526 memories, with a serial communication module.(optional).
- 1.5km far remote control system, easy to monitor and control (optional).
- Temperature and vacuum calibration.
- Alarming function.
- Vacuum Backfilling System(optional).



power on interface



manual mode interface



automatic mode interface



freeze drying data



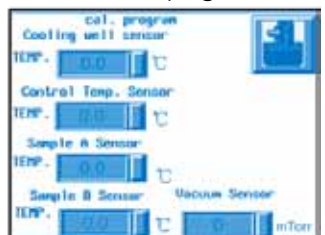
history data of cooling well



history curve of cooling well



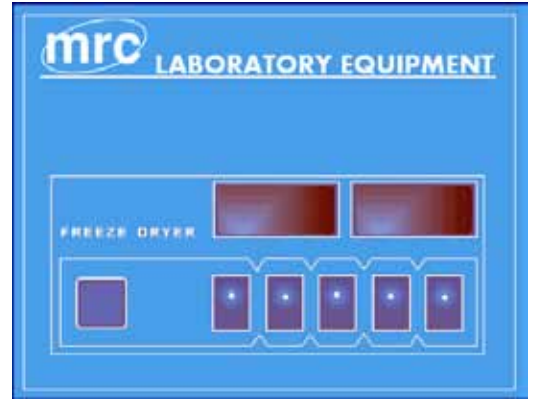
pump testing function



calibration program

**B-Controller**

- Two drying modes: automatic and manual.
- Automatic purge system, to protect samples by preventing of counter-flow of vacuum pump oil.
- Defrosting system.
- Compressor delayed start function to minimize any damage to compressor.
- Monitoring system, monitoring vacuum pressure, ice condenser temperature & sample temperature (option).
- Vacuum backfilling system.



**APCS-Automatic program control system (optional)**

mode interface      program memory function      monitoring samples's, shelves & cooling well's temp.      monitoring freeze drying data      drying controlling diagram

drying curve of cooling temp.      pressure curve      shelf temp. curve      sample A temp. curve      password signature encryption

**P-Controller**

- Two drying modes: automatic and manual.
- Automatic Purge System.
- Defrosting system.
- Compressor delayed start function to minimize any damage to compressor.
- Automatic purge system protects samples by preventing of counter-flow of vacuum pump oil.
- Build-in computer and LCD touch screen program control, 5000 Memories.
- Monitoring system, monitoring vacuum pressure, ice condenser temperature and sample temperature.
- Documentation system, data saves per minute,

- continue 730 days and 5,260,000 memories, with a serial communication module(optional).
- 1.5km far remote control system, easy to monitor and control (optional).
- Temperature and vacuum calibration.
- Alarming function.
- Vacuum Backfilling System(optional).
- Simulates industry freeze dryer, realizing program control.
- APCS fully automatic control software from prefreezing to defrosting,digital signature encryption (optional).
- Preset shelf temperature, obtained the eutectic temperature, the triple point temperature, freeze-drying curve.

manual mode interface      automatic mode interface      self-programming      curve of control temp. & pressure      history data

program storage & documentation      freeze-drying data      calibration program      curve of shelf temp.      curve of sample temp.

## Accessories:

### 1. Drying Chambers



Clear Drying Chamber CDC18x06/H

Model	CDC18x06 / CDC18x06H
Shelf diameter	23CM
Tray diameter	18CM
Number of shelf	6
Amount of 7ml serum bottle	6x50=300

**Explanation:**

**CDC:** Clear Drying Chamber  
**23:** shelf diameter 23cm

**06:** number of shelves  
**H:** heated shelves, displaying the curve



Clear Drying Chamber&Valves CDC18x06x12/H

Model	CDC18x06x12 / CDC18x06x12H
Shelf diameter	23CM
Tray diameter	18CM
Number of shelf	6
Number of flask	12
Amount of 7ml serum bottle	6x50=300

**Explanation:**

**CDC:** Clear Drying Chamber  
**23:** shelf diameter 23cm

**06:** number of shelves  
**12:** number of flask  
**H:** heated shelves, displaying the curve

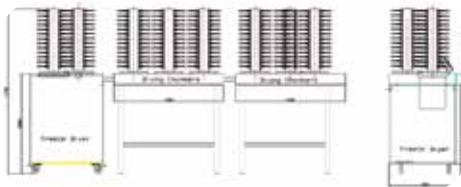


Clear Stopping Chamber&Valves CSC18x03x12/H

Model	CSC18x03x12 / CSC18x03x12H
Shelf diameter	23CM
Tray diameter	18CM
Number of shelf	6
Number of flask	12
Amount of 7ml serum bottle	3x50=150

**Explanation:** S: Stopping

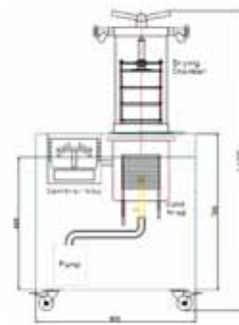
### 2. Manifold



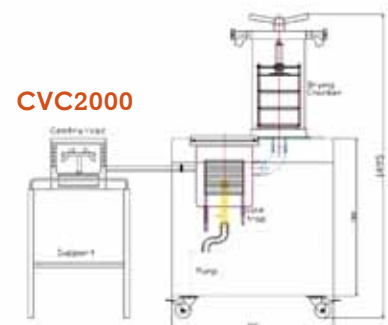
Generally the freeze dryer body connect 1 or 2 manifolds, more external groups of manifold are available with specials external vacuum stand, each external group includes 3 manifolds

Model	Description
MF52	52-Port manifold for lyophilizing small samples in vials
MF104	104-Port manifold for lyophilizing small samples in vials
MF16	16-Port manifold for lyophilizing smaller in vials
MF24	24-Port manifold for lyophilizing smaller flasks

### 3. Centrifugal vacuum concentrator and freeze fryer with centrifugal vacuum concentrator



Freeze dryer with build in centrifugal vacuum concentrator



Freeze dryer with separate centrifugal vacuum concentrator

### 4. Flasks:



R-Round bottom



F-Flat bottom

Capacity	Model
50 ml	CF050R, CF050F
100ml	CF100R, CF100F
250ml	CF250R, CF250F
500ml	CF500R, CF500F

**Explanation:** 50: Capacity 50ml flask •

F: Flat bottom • R: Round bottom

### 5. Serum Bottles:

Capacity	Model
2ml	SB02
5ml	SB05
7ml	SB07
10ml	SB10
15ml	SB15
20ml	SB20
30ml	SB30
50ml	SB50

**Explanation:** 02: 2ml Serum bottle



**Model: DW-YW110A/166A/196A/226A/358A/508A, Chest Type Freezer****Effective capacity: 110/166/196/226/358/505 Liters. Temperature range: -10°C ~ -25°C****Features:**

- Chest type.
- Inside temperature from -10°C to -25°C, can be set freely.
- Digital temperature display.
- Round corner design of doors, with lock.
- Outer body is painted steel board, inside is aluminum.
- 40mm foaming insulation.
- China good quality compressor (1 unit).
- 1 unit basket made of steel wire are convenient to store articles.
- Delayed start and safe stop interval between restart and being terminated.
- Quick freezing function, 2-3 hours come to -25°C very fast.
- 4 units Casters for easy handling.
- Refrigerant as R134a, CFC free.
- Certificate: ISO9001, ISO14001, ISO13485.
- Power supply: 220V/150Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- **Optional: Basket.**

Model	Capacity	External size(mm)	Inside size(mm)	Input power	Weight (N.T/G.T)
DW-25YW110A	110 Liters	W549xD549xH845	W410xD410xH654	145W	31Kg/46Kg
DW-25YW166A	166 Liters	W556xD906xH937	W430xD780xH480	160W	46Kg/71Kg
DW-25YW196A	196 Liters	W556xD1056xH937	W430xD930xH480	180W	51Kg/67Kg
DW-25YW226A	226 Liters	W556xD1206xH937	W430xD1080xH480	207W	56Kg/71Kg
DW-25YW358A	358 Liters	W730xD1204xH968	W530xD1080xH625	320W	82Kg/97Kg
DW-25YW508A	508 Liters	W730xD1554xH968	W530xD1400xH685	375W	100Kg/115Kg

**Model: DW-40FL90/135/270, DW-25YL270, Upright Type Freezer****Effective Capacity: 90/135/270 Liter.****Temperature range: -10°C ~ -40°C, -10°C ~ -25°C****Features:**

- Vertical cabinet (upright).
- Temperature range: from -10°C to -40°C, -10°C to -25°C, can be set freely.
- Microprocessor temperature controller.
- LCD display, to make clear the temperature information.
- Elegant orange plastic coating.
- ABS interior.
- The safety lock on the door.
- Rotatable sure-grip door handle.
- Perfect audible/visual alarm: High or low temp. alarm, system failure alarm.
- 90 mm extra thick insulation.
- The Danfoss compressor (1unit) and EBM fan motor.
- Password protected configuration page.
- 4 Casters provided for easy handling.
- 4units drawers(plastic) for DW-FL90, 5units drawers for DW-FL135, 7units drawers for DW-FL270.
- Refrigerant as R507, CFC free.
- Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- Certificate: CE mark for DW-FL90/270, ISO9001, ISO14001, ISO13485.
- **Optional: chart recorder, Italy Carel controller.**

Model	Capacity (Liter)	External size(mm)	Inside size(mm)	Input power	Weight (N.T/G.T)
DW-40FL90	90	W623xD544xH842	W438xD388xH539	280W	44Kg/48Kg
DW-40FL135	135	W623xD544xH1123	W438xD388xH794	280W	54Kg/60Kg
DW-40FL270	270	W623xD544xH1680	W438xD388xH1580	370W	65Kg/70Kg
DW-25YL270	270	W623xD544xH1680	W438xD388xH1580	370W	65Kg/70Kg

### Model: DW-40FL531, Upright Type Freezer

Effective Capacity: 531 Liter. Temperature range: -10°C ~ -40°C



#### Features:

- Upright type.
- Inside temperature ranging from -10°C ~ -40°C can be set freely, controlling precision is 1°C.
- Stainless steel interior, Outer is painted steel panel.
- Front opening lockable door with full height handle.
- 110mm foaming insulation Vacuum release port.
- Inner 3 shelves Stainless steel with inner door.
- Imported Danfoss compressor, 2-4hours cooling temperature come to -40°C steady.
- Fan electromotor with internationally famous of Germany EBM.
- Microprocessor-based temperature control system, Digital temperature display.
- Keyboard lock & password protected configuration page.
- Audible and visual alarm: High or low temperature alarm, Power failure alarm, Low battery alarm, Door ajar alarm, Filter blocking alarm, system failure alarm.
- With temperature printer, record 7 days data.
- 72 hour battery back up for printer & controller display.
- 4 units Casters for easy handling.
- Mixture gas with R134a,R404a,R23, R24,N2, R600a and more, CFC free.
- Certificate: IS09001, IS014001,IS013485.
- Power supply: 220V/150Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- **Optional: Chart recorder, CO2 back-up, storage racks, boxes.**

Model	Capacity	External size (mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-40FL531	531 Liters	W940xD840xH1999	W650xD600xH1345	1000W	235Kg/250Kg



### Model: DW-40FL262/362, Upright Type Freezer

Effective Capacity: 262/362 Liter.  
Temperature range: -10°C ~ -40°C

#### Features:

- Vertical cabinet (upright).
- Temperature range from -10°C.to -40°C. can be set freely.
- Microprocessor-based temperature controller.
- LCD display.
- Elegant orange plastic coating, Outer is steel board, Inside is stainless steel.
- Door with safety lock.
- Rotatable sure-grip door handle.
- Audible/visual alarm for high or low temperature alarm.
- 110 mm extra thick insulation.
- 1 unit Danfoss compressor and EBM fan motor.
- Password protected configuration page.
- 4 Casters provided for easy handling.
- Inside is 4 units shelves (wire steel).
- Refrigerant as R507, CFC free.
- Certificate: ISO9001, ISO14001, ISO13485.
- Power supply: 220V /50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- **Optional: chart recorder.**

Model	Capacity (Liter)	External size(mm)	Inside size(mm)	Input power	Weight (N.T/G.T)
DW-40FL262	262	W930xD731xH1227	W580xD426xH1036	300W	86Kg/92Kg
DW-40FL362	362	W930xD731xH1627	W658xD426xH1290	400W	102Kg/110Kg

**Model:DW-86HL100, Upright Type Freezer****Effective Capacity:100 Liter****Temperature range: -10°C to -86°C**  
(limit temp. is -90°C)**Features:**

Upright type • Inside temperature ranging from -10°C~-86°C can be set freely, controlling precision is 1°C, with printer • Outer steel board, Stainless steel interior • Front opening lockable door with full height handle • 120mm foaming insulation • Vacuum release port • Inner 2 shelves Stainless steel with inner door • Imported Danfoss compressor, One compressors work, 3-4hours come to -86°C • Fan electromotor with Germany EBM • Microprocessor-based temp. control system, platinum resistance sensors •

Digital temperature display • Keyboard lock and password protected configuration page • Audible and visual alarm: • High or low temperature alarm, Power failure alarm, Low battery alarm, Door ajar alarm, Filter blocking alarm, system failure alarm • With temperature printer, record 7 days data • 72 hour battery back up for printer & controller display • 4 units Casters for easy handling • Mixture gas with R134a,R404a,R23,R24,N2,R600a and more, CFC free • Certificate: ISO9001, ISO14001,ISO13485 • Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz • **Optional: chart recorder, CO<sup>2</sup> back up, storage racks, boxes.**

Model	Capacity	External size (mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-86HL100	100 Liters	W720xD1000xH793	W450xD450xH500	1000W	225Kg/250Kg

**Model:DW-86HW50, Small chest freezer****Effective Capacity:49 Liter****Temperature Range: -10°C to -86°C**

The Ultra-low Temperature Freezer offers a wide variety of research & storage applications, such as low temperature scientific experiments, preservation of plasma, biomaterial, vaccine, biomedical product, and testing low-temperature-resistant properties of products. It is suitable for research institutes, electronic industries, chemical engineering industries, hospital, sanitation and anti epidemic stations, university laboratories, military industries.

**Control System:**

- Microprocessor-based temperature controller , -10°C~-86°C can be set freely , controlling precision is 1°C, Digital temperature display
- Audible and visual alarm: High or low temperature alarm, system failure alarm
- Delayed start and safe stop interval between restart and being terminated
- Power supply: Normally 220V /50Hz 1 phase, can be changed as 220V 60HZ or 110V 50/60HZ.

**Refrigeration System:**

- Danfoss compressor (1unit) with Germany EBM fan motor
- Quick freezing switch, 3 hours cooling temperature come to -86°C
- Technology of mixture refrigerant, which composed of R134a,R404a,R23,R24,N2,R600a and more, CFC free
- Certificate:CE, ISO9001, ISO14001, ISO13485

**Structure Design:**

- Chest type
- Stainless steel interior, outer is painted steel panel
- Top door with key lock
- 90mm extra thick heat insulation
- 4units Casters for easy handling
- Optional: CO<sub>2</sub> back up system, Basket.

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-86HW50	49 Liters	-10°C ~ -86°C	W600xD560xH910	W343xD343xH415	300W	60Kg/66Kg

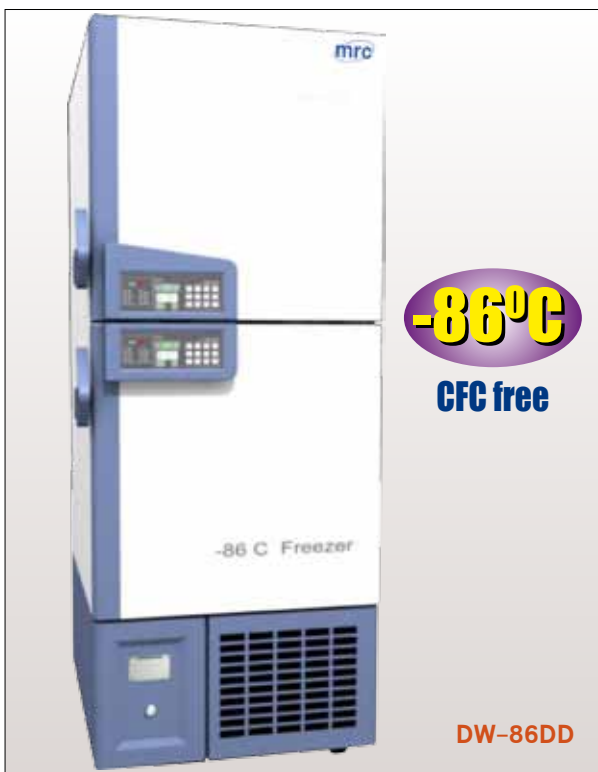


**Model: DW-65/86HL218/328/388/538/828, Upright Type Freezer**  
**Effective Capacity: 218/328/388/538/828Liter**  
**Temperature range: -10°C ~ -65°C/-86°C (limit temp. is -90°C)**

**Features:** Upright type • Inside temperature ranging from -10°C~-86°C can be set freely , controlling precision is 1°C • Stainless steel interior, Outer is painted steel panel • Front opening lockable door with full height handle • Vacuum release port • Inner 3 shelves Stainless steel with inner door (218Liter is 2 shelves) • Imported Danfoss compressor, Tow compressors parallel connection, low noise level • 2-4 hours come to -86°C • Microprocessor-based temperature control system, platinum resistance sensors • Digital temp. display • Keyboard lock and password protected configuration page • Audible and visual alarm: • High or low temp. alarm, Power failure alarm, Low battery alarm, Door ajar alarm, Filter blocking alarm, system failure alarm • With temperature printer, record 7days data • 72 hour battery back up for printer & controller display • 4 units Casters for easy handing • Mixture gas with R134a,R404a, R23,R24,N2,R600a & more, CFC free • Certificate: CE mark, ISO14001,ISO13485 • Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz •

**Optional: chart recorder, CO<sup>2</sup> back up, storage racks, boxes.**

Model	Capacity	Temp. range	External size(mm)	Inside size(mm)	Input power	Weight (N.T/G.T)
DW-65GL218 DW-86HL218	218 Liters	-10°C ~ -65°C -10°C ~ -86°C	W940xD840xH1552	W582xD470xH768	1000W	225Kg/250Kg
DW-65GL328 DW-86HL328	328 Liters	-10°C ~ -65°C -10°C ~ -86°C	W940xD840xH1999	W582xD470xH1200	1500W	320Kg/350Kg
DW-65GL388 DW-86HL388	388 Liters	-10°C ~ -65°C -10°C ~ -86°C	W940xD840xH1999	W600xD538xH1200	1800W	330Kg/360Kg
DW-65GL538 DW-86HL538	538 Liters	-10°C ~ -65°C -10°C ~ -86°C	W940xD840xH1999	W650xD600xH1345	2000W	360Kg/380Kg
DW-65GL828 DW-86HL828	828 Liters	-10°C ~ -65°C -10°C ~ -86°C	W1230xD996xH2056	W930xD710xH1323	3200W	420Kg/450Kg



**Model: DW-86DD498, Upright Type Freezer, Double control system, door, cooling system**  
**Capacity: 498Liter Range: -10°C ~ -86°C**

**Control System:** Double microprocessor-based temp. controller, -10°C ~ -86°C can be set freely & control each room separately, controlling precision is 1°C, Digital temp. display • Keyboard lock and password protected configuration page,Delayed start and safe stop interval between restart and being terminated • Audible and visual alarm: High or low temperature alarm, Power failure alarm, Low battery alarm, Door open alarm, Filter blocking alarm, system failure alarm • Power supply: 220V /50Hz 1 phase, can be changed as 220V 60HZ or 110V 50/60HZ.

**Structure Design:** Upright type, double door for up and down rooms. Stainless steel interior, Outer is painted steel panel, 4 units Casters for easy handing • Front opening lockable door with full height handle, with Vacuum release port Adjustable 1 stainless steel shelves with inner door for each room, double silicon gasket seal • Two-times foaming technology. 110mm foaming insulation, with VIP+ • With temperature printer, record 7 days data. 72 hour battery back up for printer and controller display • Optional: Chart recorder, CO<sub>2</sub> back up system, storage boxes, Remote alarm system.

**Refrigeration System:** Double cooling system to support different rooms separately and independently. If one system damage, another one can work normally • Imported Danfoss compressor and EBM fan motor.

Model	Capacity	Temp. range	External size(mm)	Inside size(mm) WxDxH	Input power	Weight (N.T/G.T)
DW-86DD498	498 Liters	-10°C ~ -86°C	W1200xD882xH2011	UP: 880x500x516+880x70x464 Down: 880x500x516+880x14x440	1800W	320Kg/340Kg

**Model: DW-164ZW128/258, Chest Type Freezer** Effective capacity: 128/138/258/328/400L  
 Temperature range: -120°C/-110°C/-10°C ~ -65°C/-86°C/-105°C/-135°C/-152°C/-164°C

**Features:**

Chest type • Inside temperature ranging from -120°C~-164°C can be set freely , controlling precision is 1°C • Stainless steel interior, outer is painted steel panel • Rotatable assistant door handle, door with key lock • 150mm extra thick heat insulating layer (155mm: DW-MW/HW/GW) • Imported Danfoss compressor (1 unit), 4-6 hours come to -164°C • Fan Motor EBM • Digital temperature display • Keyboard lock and password protected configuration page • Audible & visual alarm: High or low temperature alarm, Power failure alarm, Low battery alarm, Door ajar alarm, Filter blocking alarm, system failure alarm • With temperature printer, record 7days data. 72 hour battery back up for printer & controller display • 4 units Casters for easy handling • Power supply: 380V/50Hz 3 phase, can change as 220V/60Hz (220V/50Hz 1 phase: DW-MW/HW/GW) • Standard as 1 unit basket (DW-ZW/LW/UW/MW) • Mixture gas with R134a,R404a,R23,R24,N2,R600a and more, CFC free • Certificate: CE mark, ISO9001, ISO14001, ISO13485 • **Optional: chart recorder, CO<sup>2</sup> back up, storage racks, boxes.**

**-65°C****-10°C ~ -65°C Freezer**

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-65GW138	138 Liters	-10°C ~ -65°C	W1404xD914xH1215	W490xD470xH582	800W	215Kg/250Kg
DW-65GW328	328 Liters	-10°C ~ -65°C	W2114xD914xH1215	W450xD1200xH580	1500W	260Kg/330Kg

**-86°C****-10°C ~ -86°C Freezer**

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-86HW50	49 Liters	-10°C ~ -86°C	W600xD560xH910	W343xD343xH415	300W	60Kg/66Kg
DW-86HW131	131 Liters	-10°C ~ -86°C	W890xD1320xH1009	W470xD570xH490	800W	230Kg/250Kg
DW-86HW328	328 Liters	-10°C ~ -86°C	W890xD2005xH1009	W470xD1200xH582	1500W	300Kg/320Kg
DW-86HW405	405 Liters	-10°C ~ -86°C	W890xD2005xH1009	W540xD1270xH590	1500W	320Kg/340Kg
DW-86HW645	645 Liters	-10°C ~ -86°C	W1150xD2050xH1009	W815xD1200xH660	2500W	340Kg/360Kg

**-105°C****-10°C ~ -105°C Freezer**

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-105MW138	138 Liters	-10°C ~ -105°C	W890xD1320xH1009	W470xD570xH490	1000W	215Kg/250Kg
DW-105MW328	328 Liters	-10°C ~ -105°C	W890xD2005xH1009	W470xD1200xH582	1800W	330Kg/360Kg

**-135°C****-10°C ~ -135°C Freezer**

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-135LW128	128 Liters	-10°C ~ -135°C	W880xD1590xH1040	W370xD600xH550	215W	215Kg/250Kg
DW-135LW258	258 Liters	-10°C ~ -135°C	W890xD2085xH1009	W410xD1140xH552	330W	330Kg/360Kg

**-152°C****-110°C ~ -152°C Freezer**

Model	Capacity	Temp. range	External size(mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-152UW128	128 Liters	-110°C ~ -152°C	W880xD1590xH1040	W370xD600xH550	2600W	215Kg/250Kg
DW-152UW258	258 Liters	-110°C ~ -152°C	W890xD2085xH1009	W410xD1140xH552	5000W	330Kg/360Kg

**-164°C****-120°C ~ -164°C Freezer**

Model	Capacity	Temp. range	External size (mm)	Inside size (mm)	Input power	Weight (N.T/G.T)
DW-164ZW128	128 Liters	-110°C~-164°C	W880xD1590xH1040	W370xD600xH550	3600W	215Kg/250Kg

-86°C Models	Rack Size (mm)	Racks/Freezers	Boxes/Racks	Total Boxes / Freezer
DW-86HL218	140 x 435 x 336	6	20	120
DW-86HL328	140 x 435 x 280	12	20	240
DW-86HL388	140 x 550 x 225	12	20	240
DW-86HL538	140 x 550 x 225	16	20	320
DW-86HL688	133 x 510 x 133	20	20	400
DW-86HL768	133 x 510 x 133	24	20	480
DW-86HL828	140 x 680 x 320	24	30	720

-65°C Models	Rack Size (mm)	Racks/Freezers	Boxes/Racks	Total Boxes / Freezer
DW-65GL218	140 x 435 x 336	6	20	120
DW-65GL328	140 x 435 x 280	12	20	240
DW-65GL388	140 x 550 x 225	12	20	240
DW-65GL538	140 x 550 x 225	16	20	320
DW-65GL828	140 x 680 x 320	24	30	720

-86°C Models	Rack Size (mm)	Racks/Freezers	Boxes/Racks	Total Boxes / Freezer
DW-86HW138	143 x 140 x 540	8	16	128
DW-86HW328	143 x 140 x 560	24	16	384

-65°C Models	Rack Size (mm)	Racks/Freezers	Boxes/Racks	Total Boxes / Freezer
DW-65GW138	143 x 140 x 540	8	16	128
DW-65GW328	143 x 140 x 560	24	16	384

-40°C Models	Rack Size (mm)	Racks/Freezers	Boxes/Racks	Total Boxes / Freezer
DW-40FL531	140 x 550 x 225	16	20	320

### Option: SMS Temperature & Humidity Alarm

### AL-SMS-THR Series, Smart Energy Control ... Energy Saving, Environment & Properties Protection



#### 3 simple steps starting the unit:

- Insert the SIM card
- Plug in the sensors connectors
- Connect the AC power cord.

#### Specifications:

- AC 90~260V Auto Select
- Internal 2Ah Rechargeable Battery
- Non-Stop Operation in AC power loss
- SMS Alert on AC power loss.

#### Application:

Temperature & Humidity SMS Alert Controller can be utilized in monitoring the environmental condition for commercial, medical, food , storage, weather station, military, manufacturing industries.

It makes use of SMS to alert users of temperature and humidity conditions via SMS. By implementing the bundled Server/Client Software and GSM modem, a management system of multi-controllers can be built up to monitor a number of remote sites in one single centre.

#### Features:

- Alarm Alert Modes—SMS, Phone Dial or Both.
- Each alarm is associated with its own alarm SMS text.
- Alarm SMS text is programmable by user remotely via SMS or Setup Software.
- Independent text message for each alarm . Independent text message for close or open triggered alarm.
- Configuration can be modified by user remotely via SMS or Setup Software.
- Arm or Disarm by SMS or Setup Software.
- Relay triggered by alarm or SMS command.
- Verification of command by return SMS.



FH/DFH

### FH/DFH Series, Fume Hood

It is the new technical instrument in air condition workshop and clean workshop. And it is widely applicable in electronics, mechanics, medical, and university labs.

Fume hood can be used in operation of potential risk or unknown infected factors, and the experiment of flammability, explosive volatilization and narcotics. It can protect operator and samples.

**Filter: Carbon.**

**Optional: Chemical filter,  
Hepa filter.**

FH/DFH  
with stand

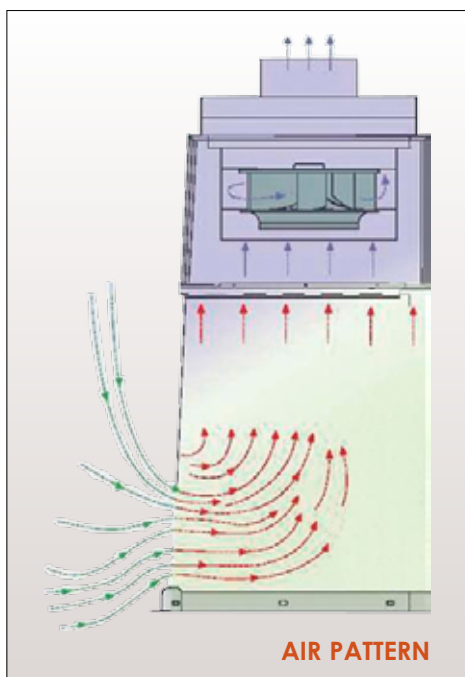
Model	FH10 DFH10 (Ductless)	FH12 DFH12 (Ductless)	FH15 DFH15 (Ductless)
External size (mm)	1000x750x2200	1200x750x2200	1500x750x2200
Internal size (mm)	900x570x745	1100x570x745	1320x745x800
Application	Provide protection to the operator		
Material	Work surface: solid chemical-resistant laminate		
	Exterior: epoxy coated cold-rolled steel		
Relative humidity	≤75%		
Ambient temperature	15°C~35°C		
Control	Microprocessor control with touch buttons		
Front sash	Sliding tempered glass, thickness no less than 5mm		
Duct length	4m		
Duct collar size	10 inch		
Inflow velocity	Average 0.5m/s		
Vibration	≤5μm (rms) between the frequency of 10Hz and 10K Hz		
Noise level	≤60db		
Lighting	≥680lux		
Fan	Centrifugal, adjustable speed		
Power	≤800W		
Power supply	220V, 50Hz		
Option	Water tap, gas tap, cup sink, etc.		
Compliance	CE		



- 1. Front Panel
- 2. Distilled Water
- 3. Vacuum
- 4-5. Sockets
- 6. Base Cabinet
- 7. Control panel
- 8. Work Table
- 9. Front window
- 10. Cold water
- 11. Gas gap
- 12. Power switch



**CONTROL PANEL**



## FH-15i, Fume Hood

FH-Series Fume Hood is the first defense to minimize chemical exposure to research workers. They are considered the primary means of protection from inhalation of hazardous vapors. our FH-Series fume hood has five models.

### Advantage:

- UV lamp. Sterilize the working area
- LCD display screen
- See the air velocity directly
- The fan is inside. Easy to install, save time
- The air velocity is adjustable (6 levels)
- Automatic front window
- Removable work surface
- Easy to clean
- Power switch
- Work Table
- Front window
- Cold water
- Gas gap
- Control panel.

Model	FH-15i
Exterior size (LxWxH)	1500x900x2500mm
Work Area (LxWxH)	1320x850x950mm
Base Cabinet	Height is 720 mm, the exterior size include the cabinet height
Protection Class	Class I
Protection Type	IP 20
Air Velocity (m/s)	0. 2m/s — 0. 7m/s
Noise	≤ 60dB(A)
Exhaust Duct	PVC,standard length: 4 meters
Pipe Collar (mm)	(∅)290
Fluorescent Lamp	28Wx1
UV Lamp	30Wx1
Blower	Centrifugal fan, speed adjustable. The fan inside the Fume Hood
Glass window	Two layer toughen glass, 5mm thickness: Motor control, height adjustable
Power supply	110-220V/50-60Hz (optional)
Power consumption	800W
Standard Accessory	Water tap:One
	Water cup:One
	Air tap:One
	Water proof socket: two
Material	Exterior body : Cold-roll steel sheets, coated with anti-bacteria powder Interior: Adopts high grade melamine board with good acid and alkali resistance function Work table: Using Solid Chemical-Resistant board
Optional Accessory	HEPA Filter/Carbon active Filter/Chemical Filter
Net Weight	280 kg
Gross Weight	400 kg
Package Size	Main body: 1.66x1.11x2.14 Base Cabinet: 1.66x1.11x0.9





BBS-13

**BBS-13HGS/BBS13VGS, Laminar Airflow Cabinets**

Model	BBS13HGS	BBS13VGS
External DIM.(mm)	L1300xW750xH2000	L1310xW825xH2000 including the base stand
Working zone size(mm)	L1200xW645xH610	L1200xW500xH570
HEPA Filter DIM.(mm)	L1223xW570xH69	
Display	Digital airflow display	
Hepa filter	HEPA filter with 99.997% efficiency at 0.3 micros	HEPA filter, the filtration performance: 99.99% to 0.5µm
Dust	≤3.5 Granule/L for ≥0.5µm	
Noise level	≤60db	
Airflow	Horizontal, 0.3-0.5m/s	Vertical, 0.3-0.5m/s
Vibration level	XYZ direct <5µm	
UV lamp	30W x 1	
Light	28W x 1	
Worktable material	304 Stainless steel	
Consumption	600W	
Power supply	AC 220V, 50Hz	
Certification	CE, ISO13485, ISO9001, ISO14001	



BBS-SDS

**BBS-DDS/BBS-SDS, Horizontal Laminar Airflow Cabinets**

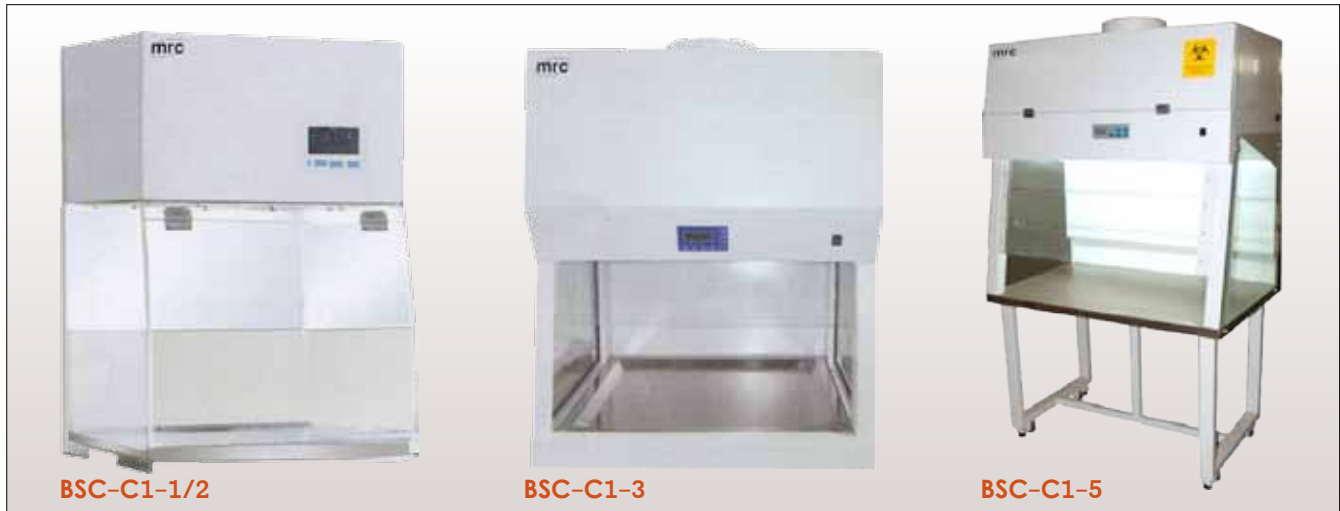
Model	BBS-DDS	BBS-SDS
Protection	Sample	
External DIM.(mm)	L1060xW800xH1690	L1460xW800xH1690
Internal DIM.(mm)	L980xW500xH600	L1400xW500xH600
Dust	≥0.5um≤3.5 granule/L	
Clean rate	>99.995% (for 0.3 um)	
Air velocity	0.3-0.5m/s	
Noise	<60dB(A)	
Vibration	XYZ direct<2 um	
Worktable material	304 Stainless steel	
Consumption	340W	400W
Light	20Wx1	28Wx1
UV lamp	20Wx1	30Wx1
Net Weight	103kg	133kg
Gross Weight	143kg	183kg



BBS-SDS

**BBS-DDC/BBS-SDC, Vertical Laminar Airflow Cabinets**

Model	BBS-DDC	BBS-SDC
External DIM.(mm)	L1100xW740xH1740	L1500xW740xH1740
Internal DIM.(mm)	L940xW540xH630	L1340xW540xH630
Dust	≥0.5um≤3.5 granule/L	
Clean rate	>99.95% (for 0.5 um)	
Air velocity	0.3-0.5m/s	
Noise	<60dB(A)	
Vibration	XYZ direct<2 um	
Front windows	Tempered glass, no less than 5mm	
Worktable material	Stainless steel	
Consumption	340W	380W
Light	20Wx2	
UV lamp	20Wx1	30Wx1



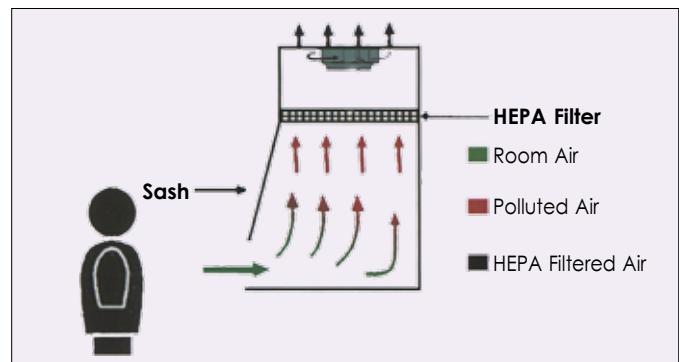
### BSC-C1-1, BSC-C1-2, BSC-C1-3, BSC-C1-5, Class I

The Class I Biosafety cabinet is designed to provide personnel and environmental protection.

- Class I Biosafety Cabinet does not protect the product from contamination because un-purified room air constantly enters into work area.
- As a partial containment unit, the Class I Biosafety Cabinet is suitable for work in low to moderate risk agents (Biosafety Levels 1,2 and 3) where there is a need for control but not for product protection.
- Unlike conventional fume hood, the HEPA filter in the Class I Biosafety Cabinet protect the environment by filtering air before it is exhausted.
- With the negative pressure, personnel protection is made possible by constant move of air into the work area.

#### Features:

- Soft touch control panel, LCD display.
- UV lamp for sterilization.
- Stable air flow system.
- provide firm protection to personnel & environment.
- Energy-saving, high efficiency, low noise.
- One piece 304 stainless steel work table, easy for cleaning.



Model	BSC-C1-1	BSC-C1-2	BSC-C1-3	BSC-C1-5
External Size (WxDxH)	550x395x730 mm	700x550x900 mm	900x695x1080 mm	1100x695x1924 mm
Internal Size (WxDxH)	540x385x450 mm	680x450x500 mm	768x690x580 mm	968x695x630 mm
HEPA Filter	99.999% efficiency at 0.3um			
Airflow Velocity	0.38 m/s 0.6 m/s			
Noise	< 55 dB			
Fluorescent Lamp	15W*1	18W*1	14W*2	21W*1
UV Lamp	15W*1	18W*1	20W*1	20W*1
Consumption	150W	160W	180W	400W
Base Stand	No			738 mm height
caster	No			Universal wheel
Power Supply	110/220V ± 10%, 50/60Hz			
Material	Main Body	PMMA	Cold-rolled steel coated with anti- bacteria powder	
	Work Table	304 stainless steel		
	Base Stand	No		Cold-rolled steel
Standard Accessory	Fluorescent Lamp, UV Lamp			+ Base Stand
Gross Weight	40 kg	60 kg	100 kg	150 kg
Package Size (WxDxH)	755x600x950 mm	950x700x1125 mm	1050x850x1280 mm	1250x840x2250 mm



BSC11A

**BSC11A, Class I**

The Class I Biological Safety Cabinet is a negative-pressure, ventilated cabinet usually operated with an open front and a minimum face velocity at the work opening of at least 75 linear feet per minute (lfpm). All of the air from the cabinet is sent through a HEPA filter, either into the laboratory or to the outside.

Model	BSC11A
Overall dimension	680x400x1160 (mm)
Operation are dimension	630x375x615 (mm)
Filter dimension	305x610x69
Filter efficiency	For 0.3µm particulates, filter efficiency>99.99%



BSC-8

**BSC-8, Class II**

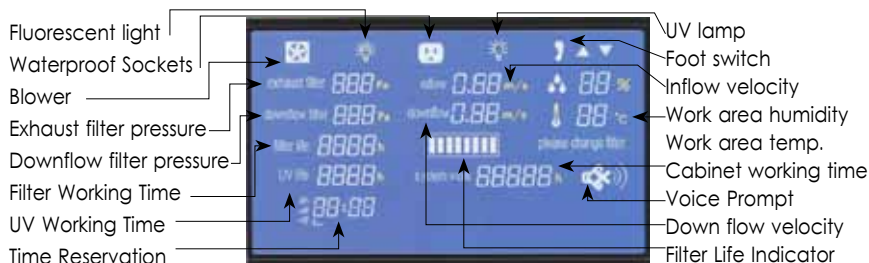
Model	BSC-8
External Size	700x650x1230 mm
Internal Size	600x500x540 mm
Tested Opening	Safety Height ≤200 mm
Max Opening	400 mm
Inflow Velocity	0.53 m/s
Down flow Velocity	0.33 m/s
Filter	Two HEPA filters, 99.999% efficient (0.3 microns)
Front Windows	Two-layer toughened glass, 5mm
UV Lamp	18W*1
Fluorescent Lamp	14W*1
Lighting (Lux)	680
Noise	≤ 65dB
Power (W)	1000
Waterproof Socket	2
Display	LCD display
Control System	Microprocessor
Material	Work zone: 304 stainless steel.
	Body: Epoxy coated cold rolled steel. ABS front panel.
Clean Level	100
Weight	Net weight: 80kg
	Gross weight: 11 0kg
Package Size	950x850x1430 mm
Standard Configuration	Body, UV lamp and Fluorescent lamp
Optional Accessory	Base stand, Armrest, Formalin fumigation sterilizer, Ammonium hydrogen carbonate neutralizer, Air curtain tester

- Small dimension, easy to move.
- Germany fan, speed adjustable; American filters.
- Large LCD display. Operators can find detailed status of the cabinet, such as inflow and down flow velocity/work area temp. & humidity/filter pressure,UV working time and filter working time/ filter changing etc.
- Time reserve function. This can save half an hour waiting time after activating the cabinet and the sterilization time after experiment finishing.
- Remote control. Every function can be realized 6 meters away from the cabinet by remote control, this can protect the operator under emergency
- Automatic front window. One finger can adjust the height of front window.
- Voice prompt function.



## BSC-9, Class II

1. ABS front panel.
2. Control panel & LCD display.
3. Safety Power Lock
4. Fluorescent lamp (Behind the cover).
5. UV lamp.
6. Sockets.
7. Water & Gas tap.
8. Working Area.
9. Base stand.
10. Remote Control .
11. Draining Valve.
12. Foot Switch.



- Large LCD display. You can find all the information on the screen.
- Remote Control. Every function can be realized 6 meters away from the cabinet by remote control, which can protect the operators under emergency.
- Automatic front window. One finger can adjust the height of front window.
- Time reserve function. It can save half an hour waiting time after you active the cabinet & the sterilization waiting time after experiment finishing.
- Negative pressure plenum surrounds contaminated positive pressure plenum.
- Digital display of air pressure, air velocity and temperature.
- Voice prompt function.

Model	BSC-9
External/Internal size(mm)	1380 × 750 × 2290 mm / 1220 × 600 × 660 mm
Tested/ Working Opening	Safety Height ≤ 200 mm / 400 mm
Inflow Velocity	Inflow: 0.53 m/s / Down flow: 0.33 m/s
Filter	Two HEPA filters, Efficiency 99.999% at 0.3 microns
Front Window	Motorized. Two-layer toughened glass > 5 mm
Noise	EN 12469 ≤ 58 dB, NSF/ANSI 49 ≤ 61 dB
UV/ Fluorescent lamp	30 W*1 / 40 W*2
Illumination	≥ 1000 Lux
Water and Gas Tap	Water Tap: 1, Gas Tap: 1
Waterproof Socket	2*250W (max)
Display	LCD Display
Control/Airflow System	Microprocessor / 70% air recirculation, 30% air exhaust
Material	Work zone interior is made of 304 stainless steel, Main Body: Cold rolled steel with anti-bacteria powder coating
Base stand	Height is 635 mm
caster Wheel	Universal Wheel
Consumption	600W
Power Supply	110~240 V/50~60 Hz (optional)
Gross weight	400 kg
Standard Configuration	Remote control, Foot switch, UV lamp, Fluorescent Lamp, Base stand

## Biological Safety Cabinet

### Biological Safety Cabinets

- Each cabinet is tested by college of military science.
- Environment test: cabinets are tested under the cruel environment range from -40°C-50°C, and humidity range from 5%-100%.

### Biosafety Performance

- Biosafety, and operators safety: impact sampling colony number ≤10CUF/time.
- Slit sampling colony number ≤5CUF/time.
- Product safety: colony number ≤5CUF/time.
- Cross contamination: colony number ≤2CUF/time.

### Motor

- Thermal protection device assure the steady in 1.15 times of voltage rating.
- Actuator is installed behind the demountable or lockable control panel.

### Material

- Operation interior surface is made of 300 Series stainless steel.
- Front panel is made of toughened glass, which won't be negative effected by cleaning and sterilization. Thickness of front panel is no less than 5mm.
- For 0.3µm particulate, the filter efficiency is ≥99.999%, which meet the demand of temperature, humidity, corrosion proof and mechanical strength.
- Filter material is made of superfine fiberglass, which will not cause adverse impact on personnel, environment and facility.

### Front Operation Area

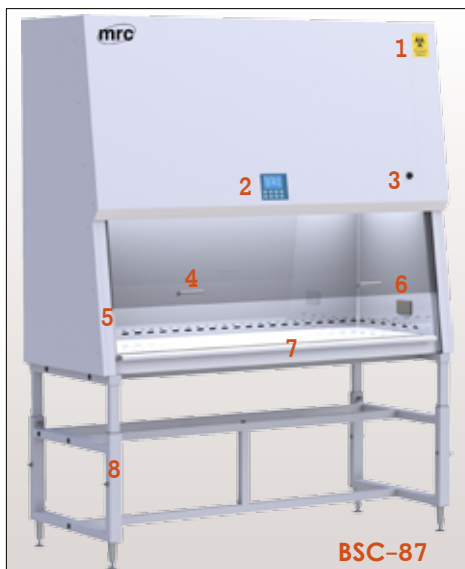
- The structure of front panel avoids danger to operator when sliding system can't work correctly.
- Alarm device assure the safety of experiments in the specialized range.

### HEPA Filter Leak Proof

- The filterability of every point measuring the filterable substance that can be scanned and detected is no more than 0.01 %.
- The filterability of every point measuring the filterable substance that can't be scanned and detected is no more than 0.005%.

### Exclusive Four Patents

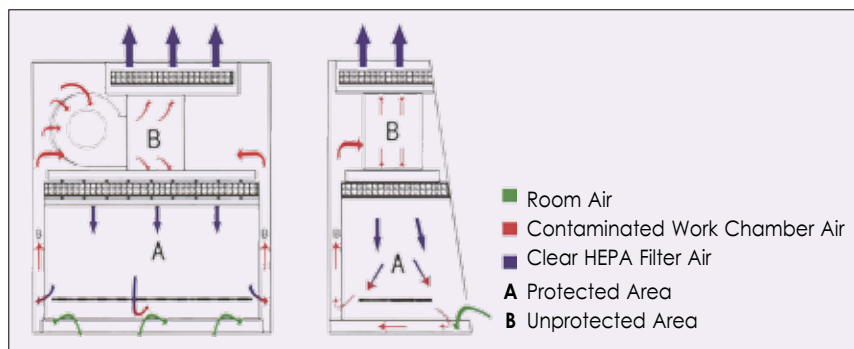
- New appearance.
- Remote control.
- Reserve timing.
- High light VFD display.



**BSC-85 BSC-86, BSC-87, Class II**

The Class II Biological Safety Cabinet is designed with inward air flow at a velocity to protect personnel, HEPA filtered vertical laminar air flow for product protection, and HEPA filtered exhausted air for environmental protection.

- Adjustable base stand, height range:630-845mm.
- One Piece removable work table, V type intake grille (BSC-85/87).
- Large LCD display. You can find all information on the screen (BSC-85/87).
- VFD display: it can demonstrate various colors with high bright, even in the evening. It can work no less than 30,000 hours continually (BSC-86).



1. Biohazard Label.
2. LCD display / VFD Display.
3. Power Lock.
4. Handle.
5. Water & Gas Tap.
6. Waterproof Socket.
7. V Type Intake Grille.
8. Adjustable Base Stand.



Model		BSC-85	BSC-86	BSC-87
<b>External size (upper body) (WDH mm)</b>		1100x740x1550	1421x850x1550mm	1886x750x1555
<b>Internal size (WDH mm)</b>		914x600x610	1220x665x650mm	1700x600x610
<b>Base Stand</b>		Adjustable height, range: 630mm-845mm		
<b>Max Opening</b>		450mm (20")		
<b>Tested Opening</b>		Safety Height ≤ 200mm (8")		
<b>Average Airflow Velocity</b>		Inflow Velocity: 0.53 m/s(105 fpm)		
		Downflow Velocity: 0.35 m/s(70 fpm)		
<b>Airflow Volume</b>	<b>Inflow</b>	349 m³/h (205 cfm)	465 m³/h (275 cfm)	649 m³/h (382 cfm)
	<b>Down flow</b>	61%: 550 m³/h (323 cfm)	67%: 956 m³/h (571 cfm)	61%: 1006 m³/h (592 cfm)
	<b>Exhaust</b>	39%: 349 m³/h (205 cfm)	33%: 465 m³/h (275 cfm)	39%: 649 m³/h (382 cfm)
<b>HEPA Filter</b>		Efficiency 99.999% at 0.3 um		
<b>Noise</b>		NSF 49 ≤ 61 dB / EN 12469 ≤ 58 dB		
<b>Illumination</b>		>850Lux		
<b>Material</b>		Working Area: 1.5mm 304 stainless steel and outside decorative plate		
		Frame: Cold-rolled steel sheets with electrostatic coating	Frame: Cold-rolled steel with anti-bacteria powder coating	Frame: Cold-rolled steel sheets with electrostatic coating
<b>Motors</b>		One ECM motor		
		Speed adjustable, high efficiency and low power consumption, 110V & 220V acceptable		
<b>Glass Control</b>		Manual	Motorized	Manual
<b>Display</b>		LCD	VFD	LCD
<b>UV</b>		18 W germicidal UV lamp	30 W germicidal UV lamp	40 W germicidal UV lamp
		Emission of 253.7 nanometers for most efficient decontamination		
<b>Waterproof Socket</b>		One, 5 holes, 500W(Max)		
<b>Tap</b>		Water Tap*1, Gas Tap*1		
<b>Filter Guard Type</b>		Aluminium Alloy		
<b>Ground Resistance</b>		< 0.10 Ω		
<b>Consumption</b>		260 W	400 W	300 W
<b>Power Supply</b>		AC 220V-110V, 50Hz/60Hz, Full load Amps: 9A, BTu/Hr. 1689		
<b>Standard Accessory</b>		Fluorescent lamp, UV lamp, 5m Power cord, Fuse tube(six), Base stand, SS water & gas taps		
<b>Package Size (WxDxH)</b>		1250x915x1890 mm	1600x1050x1870 mm	2040x915x1920 mm
<b>Gross Weight</b>		280 kg	330 kg	380 kg

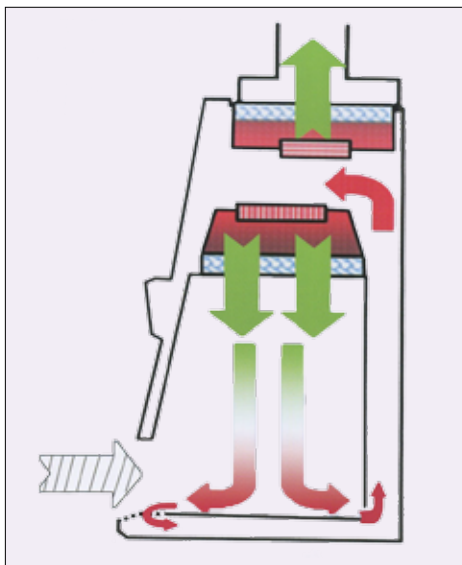


**BSC-A2-7**

### BSC-A2-7, Class II A2 Biosafety Cabinet

Class II Biosafety Cabinet BSC-A2-7 delivers maximum safety, comfort and convenience. Featuring an advanced design for easy operation & maximum safety, it could be used wherever protection is of paramount importance in safety levels 1 to 3, including research, pharmaceutical quality control labs, pharmacies, clinics and hospitals.

- The hinged front window can be fully opened for easy and thorough cleaning of the unobstructed rear wall and all interior surfaces.
- The transparent side glass windows maximize light and visibility inside the cabinet, providing a bright and open working environment.
- The 100 sloped front allows an ergonomic, fatigue-free working posture.
- The front window is motorized for convenient, one-hand operation. The window control is mounted on the front control panel.
- When fully lowered the front window, it seals automatically against a closed-cell peripheral gasket to isolate the interior and prevent escape of contaminants during decontamination.
- Front window can be closed manually in case of power failure.
- Powerful UV irradiation at the back side of the work area illuminates the entire working area without causing shadows.
- Easy to read digital LCD display allows convenient "at a glance" monitoring of safety parameters and ergonomically sized control panel improves user interface.



**Three pieces 304 stainless steel work table**



**Waterproof Socket**



**Remote control for convenient operation**



**UV-irradiation**



**LCD display**

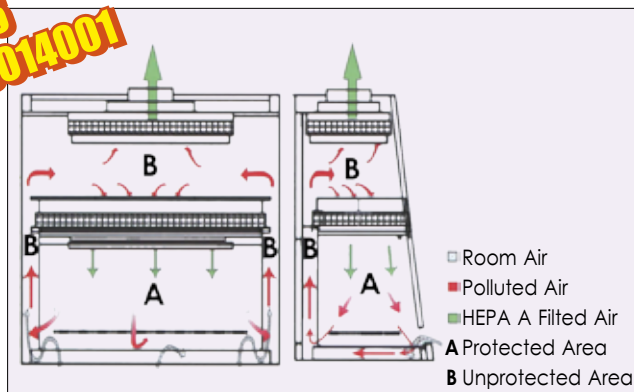
Model		BSC-A2-7
External size (WDH mm)		1300x790x2310mm
Internal size (WDH mm)		1200x600x770mm
Work Surface Height		750mm
Max Opening		480mm
Tested Opening		200mm
Average Airflow Velocity		Inflow: 0.5 m/s (98.4 fpm) Down flow: 0.36 m/s (71 fpm)
Airflow Volume	Inflow	430 m <sup>3</sup> /h (270cfm)
	Down flow	720 m <sup>3</sup> /h (430cfm)
	Exhaust	360 m <sup>3</sup> /h (220cfm)
Noise		EN 12469: ≤ 60 dB
HEPA Filter		Efficiency 99.999% at 0.3 um
Illumination		≥ 10001 Lux
UV Lamp		30W germicidal UV lamp. Emission of 253.7 nanometers for most efficient decontamination
Material		Main body: Cold-rolled steel coated with anti-bacteria powder
		Work surface: 304 stainless steel, three pieces
		Side and front window: Two-layer laminated toughened glass
Electrical (220-240V,AC,50Hz)		Cabinet consumption/Amp: 430W/2.1A
		Total load of 4 sockets: ≤ 500W
		Socket amp fuse: 6.3A
		BTU/Hr: 1466
Standard Accessory		4 Sockets, Base stand, Remote control, Fluorescent lamp, UV lamp
Gross Weight		300kg
Package Size (WxDxH)		1480x1000x1760 mm



**BSC7IIA2/BSC11IIA2X/BSC13IIA2X/BSC15IIA2X/BSC18IIA2X, Class II**

The Class II Biological Safety Cabinet is designed with inward air flow at a velocity to protect personnel, HEPA-filtered vertical laminar airflow for product protection, and HEPA-filtered exhausted air for environmental protection.

**CE, ISO13485, ISO9001, ISO14001**

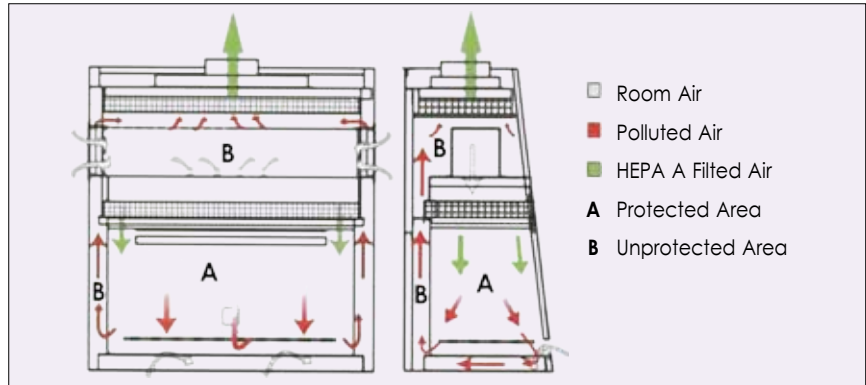


Model	BSC7IIA2	BSC11IIA2X	BSC13IIA2X	BSC15IIA2X	BSC18IIA2X
External size (WDH mm)	700x500x1200	1100x850x2200	1300x850x2200	1500x850x2265	1800x850x2300
Internal size (WDH mm)	600x400x580	900x600x660	1100x600x660	1300x600x660	1600x600x660
Tested Opening	Safety Height ≤200mm				
Max Opening	400mm				
Inflow velocity	0.53m/s				
Down Flow velocity	0.33m/s				
Filter	Two Hepa filter with 99.999% efficiency at 0.3 micros				
Front Window	Two-layer toughened glass >5mm				
Noise level	≤65dB				
Material	Work zone interior is made of 304 stainless steel. Body: epoxy coated cold rolled steel				
Base (Optional)	Height: 635mm				
Control system	Microprocessor				
Display	LED display	VFD display			
Airflow System	70% air recirculation, 30% air exhaust				
Caster Wheel	Universal Wheel	Directional Wheel			
Clean level	100				
Lighting	680Lux	800Lux			
UV lamp	15W x 1	20W x 1	20W x 1	30W x 1	30W x 1
Fluorescent lamp	40W x 1	21W x 1	21W x 1	28W x 2	28W x 2
Power (W)	800	1200			1500
Water & Gas Tap	0	Water Tap: 1 Gas Tap: 1			
Waterproof Socket	2				
Electrical	110V~ 240V/50Hz~60Hz (optional)				
Net weight (kg)	80	240	280	365	380
Gross weight (kg)	110	290	310	430	450
Package (mm)	950x850x1430	1250x1050x1870	1450x1050x1870	1640x1040x1860	1940x1050x1960
Standard Configuration	Body, UV & fluorescent Lamp	Body, Remote control, Foot switch, UV lamp & Fluorescent Lamp, Base Stand			
Optional Accessory	Armrest, Air curtain tester, Formalin fumigation sterilizer, Ammonium hydrogen carbonate neutralizer				



### BSC11IIB2X/BSC13IIB2X/BSC15IIB2X, Class II

Class II B2 Biosafety Cabinets feature downflow air drawn from within the laboratory. No downflow air is drawn from the cabinet exhaust air. All downflow & inflow air is exhausted through a HEPA filter without recirculation within the cabinet. All contaminated ducts and plenums are maintained at negative pressure. The Type B2 Biosafety Cabinet may be used for work with volatile toxic chemicals and radionuclides as required as adjuncts to microbiological studies.



Exhaust Blower



Remote Control



LCD Display



VFD Display

Model	BSC11IIB2X	BSC13IIB2X	BSC15IIB2X	BSC18IIB2X
External size (WDH mm)	1100x850x2200	1300x850x2200	1500x850x2200	1800x850x2200
Internal size (WDH mm)	900x600x660	1100x600x660	1300x600x660	1600x600x660
Tested Opening / Max Opening	Safety Height ≤200mm / 400mm			
low velocity / Down Flow velocity	0.53m/s / 0.33m/s			
Pre-filter / Filter	Washable / Two Hepa filter with 99.999% efficiency at 0.3 micros			
Front Window	Two-layer toughened glass >5mm			
Noise level	≤65 dB			
Material	Work zone interior is made of 304 stainless steel. Body: epoxy coated cold rolled steel			
Base Height	635mm			
Control system / Caster Wheel	Microprocessor / Directional Wheel			
Display	VFD display			
Airflow System	0% air recirculation, 100% air exhaust			
Exhaust Duct	Material PVC Diameter: 300mm			
Clean level / Lighting	100 / 800Lux			
UV lamp	20W x 1	20W x 1	30W x 1	30W x 1
Fluorescent lamp	21W x 1	21W x 1	28W x 1	30W x 1
Water & Gas Tap / Waterproof Socket	Water Tap: 1, Gas Tap: 1 / 2			
Electrical / Power (W)	110V~ 240V/50Hz~60Hz (optional) / 1500			
Net weight (kg)	275	320	350	375
Gross weight (kg)	350	360	440	470
Package (mm)	Main Body	1250x1050x1870	1450x1050x1870	1640x1040x1860
	Exhaust Blower	1100x1000x900	700x600x1000	700x600x1000
Standard Configuration	Body, Remote control, Foot switch, UV lamp & Fluorescent Lamp, 4 meters, Exhaust duct, 1 exhaust blower, Base Stand			
Optional Accessory	Armrest, Air curtain tester, Formalin fumigation sterilizer, Ammonium hydrogen carbonate neutralizer			



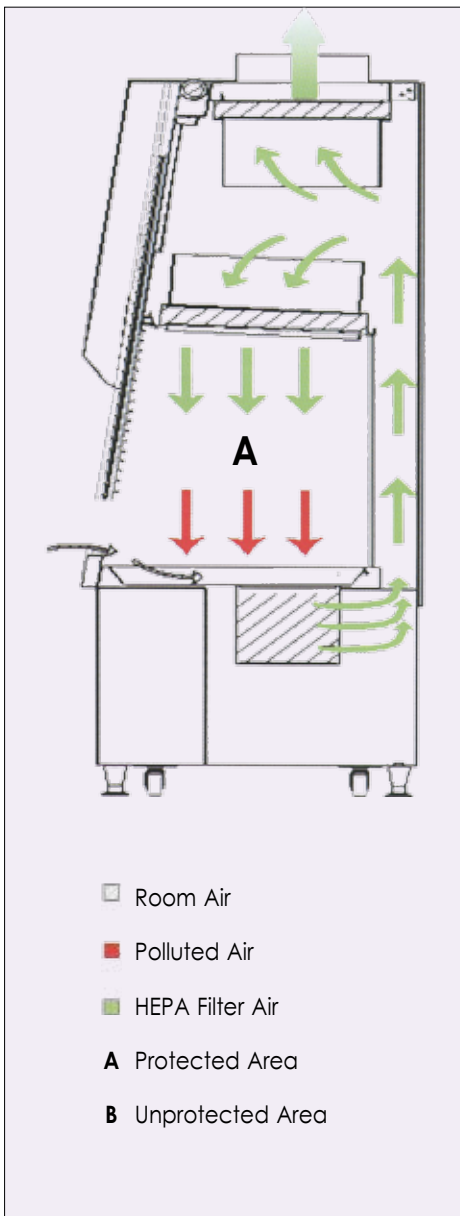
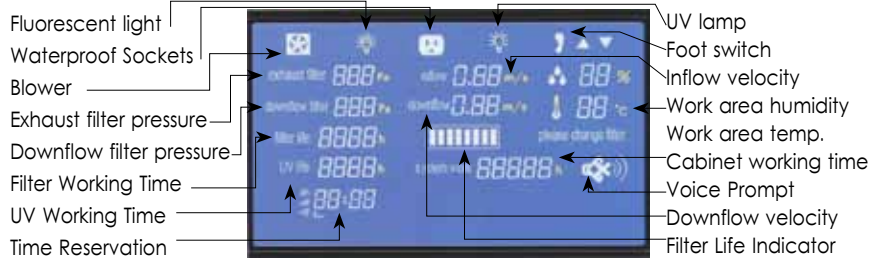


BSC-CY-4

**BSC-CY-4, Class II Biosafety Cabinet**

The MRC Cytotoxic Safety Cabinet is the premium solution for cytotoxic/antineoplastic drug processing, providing the highest level of patient, pharmacist and environmental protection. This revolutionary product builds on MRC's experience of more than 10 years as an expert in biosafety containment technology.

The unique demands of handling and preparing cytotoxic drugs for use in chemotherapy require a specialized cabinet. As cytotoxic drugs cannot be inactivated by chemical decontamination, Class II biosafety cabinets should not be used. With this in mind MRC has developed a highly specialized range of cabinets designed especially for handling these potentially dangerous drugs



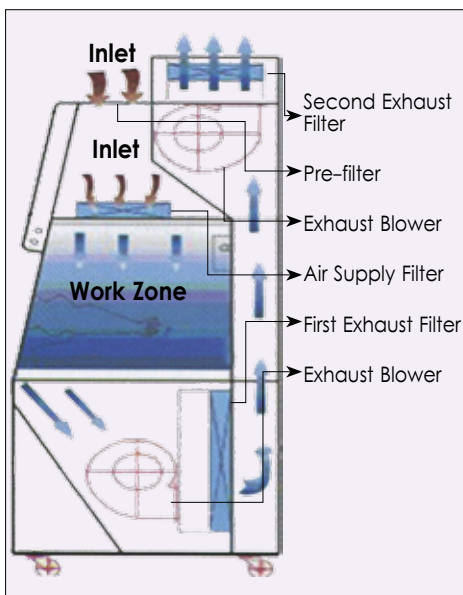
Model	BSC-CY-4	
<b>External size (WDH mm)</b>	1220x600x630 mm	
<b>Internal size (WDH mm)</b>	1370x760x2100 mm	
<b>Tested Opening</b>	Safety Height < 200mm	
<b>Max Opening</b>	480mm	
<b>Average Airflow Velocity</b>	Inflow: 0.46 m/s Downflow: 0.33 m/s	
<b>Internal Work Area, Space</b>	0.73m <sup>2</sup>	
<b>Exhaust Volume With Thimble Duct</b>	CBV Exhaust Volume	611 m <sup>3</sup> /h (360 cfm)
	Static Pressure at CBV	39 Pa / 0.15 in H <sub>2</sub> O
<b>Air Supply Filter</b>	ULPA filter, efficiency 99.999% between 0.1~0.2 um	
<b>Exhaust Filter</b>	2 pieces ULPA filter, efficiency 99.999% between 0.1~0.2 um	
<b>Front Window</b>	Two-layer laminated toughened glass	
<b>Noise</b>	≤ 62 dB	
<b>UV Lamp</b>	30W*1	
<b>fluorescent Lamp</b>	28W*2	
<b>Illumination</b>	≥ 1000 Lux	
<b>Consumption</b>	≤ 700 W	
<b>Water &amp; Gas Tap</b>	Water Tap* 1; Gas Tap*1	
<b>Socket</b>	2 Waterproof Socket: 2x250W (Max)	
<b>Display</b>	LCD Display	
<b>Control System</b>	Microprocessor	
<b>Material</b>	Work Area: 304 stainless steel Main Body: Cold-rolled steel with anti-bacteria powder	
<b>Caster</b>	Universal wheel	
<b>Power Supply</b>	110/220V±10%, 50/60Hz	
<b>Standard Accessory</b>	Remote control, Foot switch, UV lamp, Fluorescent lamp, Waterproof socket	
<b>Optional Accessory</b>	Armrest, Air curtain tester, Formanlin fumigation sterilizer, Infrared Sterilizer	
<b>Gross Weight</b>	400kg	
<b>Package Size (WxDxH)</b>	1570x950x2220 mm	



- 1. Power Switch.
- 2. Control Panel.
- 3. Pressure Meter.
- 4. Pass Box.
- 5. Gloves.
- 6. Draining Valve.



Pressure Meter



**BSC15IIIIX, BSC11IIIIX, Class III**

Class III Biosafety Cabinet is totally enclosed and gas-tight with ULPA filtered supply and exhaust air. Work is performed with long-sleeved gloves. The cabinet is kept under negative pressure of at least 120 Pa, and airflow is maintained by a dedicated exterior exhaust system. It can protect the operator, product and environment. It is designed for work with level 4 pathogens and provide an alternative to the positive-pressure suit made for maximum containment laboratories.

- Exhaust air is double-filtered through high-quality ULPA filters with typical efficiency of 99.999% for 0.12um particles, better than HEPA filters.
- An angled cabinet front ensures an ergonomic working posture.
- Cabinet operates at negative pressure relative to the laboratory in order to prevent migration of pathogenic materials out of the work area.
- It effectively sterilizes work area with UV installed inside.
- Different sizes upon request.

Model	BSC-11IIIIX	BSC-15IIIIX
<b>External Size (WxDxH)</b>	1100x800x1600 mm	1340x850x2100 mm
<b>Internal Size (WxDxH)</b>	750x560x600 mm	1240x650x650 mm
<b>Pass Box Size (WxDxH)</b>	Internal:390x380x330mm	Internal:400x390x340mm
	External:470x420x400mm	External:480x400x400mm
<b>Gloves</b>	One pair. 800 mm butyl rubber gloves	
<b>Front Window</b>	8 mm toughened glass, anti-ultraviolet radiation	
<b>Display</b>	LCD display	
<b>Pre-filter</b>	Polyester fibre, washable	
<b>ULPA Filter</b>	Air supply filter: Efficiency 99.999% at 0.12um	
	First exhaust filter: Efficiency 99.999% at 0.12um	
	Second exhaust filter: Efficiency 99.999% at 0.12um	
<b>UV Lamp</b>	20W*1, 8W*1	30W*1, 8W*1
<b>Fluorescent Lamp</b>	14W*1	28W*2
<b>Noise</b>	<63dB	
<b>Airflow Volume</b>	240-470 cfm	
<b>Main Material</b>	304 stainless steel	
<b>Pressure</b>	-120 Pa	
<b>Alarm</b>	Visual and Audio alarm	
<b>Illumination</b>	>800Lux	
<b>Power Supply</b>	110/220V±10%, 50/60Hz	
<b>Consumption</b>	400W	700W
<b>Gross Weight</b>	250kg	395kg
<b>Package Size (WxDxH)</b>	1380x950x1770 mm	2000x1000x2220 mm
<b>Standard Accessory</b>	UV lamp, Fluorescent lamp, Remote control, Gloves, Pressure meter, Drain valve	



**MSF-Series, 1050°C, 1200°C, Chamber Furnaces**

The MSF multi purpose furnace is bench mounted with a maximum temperature of 1200°C. It is available with chamber size of 3.6 Liter or 6.2 Liter.

MRC's multipurpose furnaces with stainless-steel cabinet, are suitable for every laboratory application, including burnout preheating, tempering casting and metallurgical process. For dental laboratory.

The drop down door can be used as a shelf when loading and unloading samples. A chimney is fitted for ventilation of the chamber.

**Double security:** hardware and software over-temperature protection to prevent exceeding maximum allowed temp.

Advanced PID temperature programmer suite variety of applications. The advanced set point programming temperature controller contains 15 separate programmes each with 8 stages. Optional gas inlet available.

**MSF 11/4**

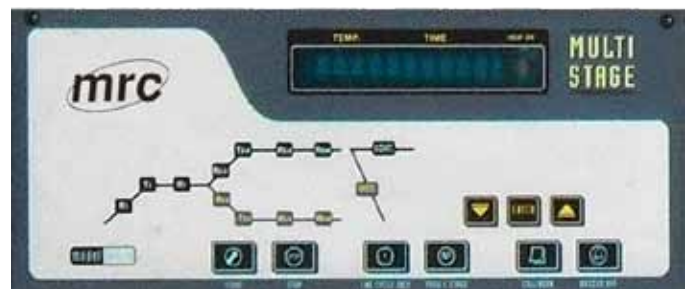
- Max temperature: 1050°C
- Inner dimensions: W180xD205xH95mm
- Outside dimensions: W350xD380xH440mm
- Power: 220V/50Hz, 110V/60Hz, 1500Watt
- Net weigh: 23Kg

**MSF 12/6**

- Max temperature: 1200°C
- Inner dimensions: W180xD250xH135mm
- Outside dimensions: W400xD490xH530mm
- Power: 220V/50Hz, 2700 Watt
- Net weight: 41Kg



- 15 programs–up to 8 stages.
- Bright VFD alpha-numeric display
- End cycle date real time programming
- Advanced keyboard, 9 key-pads only
- Heat up or cool down rates
- Calendar and time display
- Temperature and time override
- Fault and error automatic diagnostic messages:
  - Thermocouple brake - No current
  - Temperature fault - Date error
  - Over temperature - EE error
- Selectable language for messages: English, German, French, Italian.
- Celsius or Fahrenheit
- Automatically restart, the program will restart after a power failure during a burning cycle. The controller will recall the last temperature and resume program operation.



**Advanced PID Programmer**

**Unique Chamber Dimensions for dental laboratory**

MRC burnout furnaces are designed for maximum efficiency and provide a generous internal capacity despite modest overall size. Although the volume of the muffle is relatively small . This furnace enables to cast in one burnout.

**MSF 11/4:** Accept 4 rings x 9 – 4 rings x 2

**MSF 12/6:** Accept 12 rings x 9 double layer.

This advantage is very important, as it enables to gain maximum use of muffles volume.



### MSF 11/8, MSF 13/6, Muffle furnaces with fibre-insulated chambers

High accuracy laboratory electric furnaces with fibre-insulated chambers that are intended for hardening, loosening, normalizing, and other thermal processing processes up to a temperature of 1100 DC or 1300 DC. The furnaces include ceramic hearth plates. To eliminate gasses or smoke released during thermal processing, ventilation hatches and an exhaust system may be additionally installed in the products. The furnaces are an excellent fit for scientific laboratories, educational institutions, medicine, and industry.

#### Basic model:

- One-piece chamber made of fibre thermal insulation
- Heating elements embedded in vacuum formed fibre (on models up to 1100°C)
- Heating elements exposed on ceramic tubes (on models up to 1300°C)
- Microprocessor-controlled thermoregulator

- Ceramic hearth plates
- High-quality, ecological thermal insulation material
- Low electric power usage
- Short heating up/Cooling down period
- High degree of accuracy
- Exterior painted with powder coating (RAL 7035)
- Up to a 24 month guaranty period
- Supplemental equipment.

Model	Vol. l	T max. °C	Chambre DIM. (mm)			Overall DIM. (mm)			Power (kW)	Voltage (V)	Weight (Kg)
			Width	Length	Height	Width	Length	Height			
MSF 11/8	8.2	1100	200	300	133	440	620	510	1.8	230	32
MSF 13/6	6.7	1300	160	295	133	440	620	510	2.4	230	39



### MSF 12/8, MSF 13/30, Chamber furnaces with fibre-insulated chamber

Highly accurate laboratory electric furnaces with chambers made of thermal insulation fibre plates. The products are intended for hardening, loosening, normalizing, and other thermal processing processes up to a temperature of 1600 DC. To eliminate gasses or smoke that are released during thermal processing, ventilation hatches and an exhaust system may be supplementary installed in the products. The furnaces are an excellent fit for scientific laboratories, educational institutions, medicine, & industry.

**Basic model:** One-piece chamber made of fibre thermal insulation plates

- Vacuumize heating elements (up to 1100 DC)
- Heating elements in grooves (up to 1200 DC)
- Heating elements on tubes (up to 1300 DC)
- Exposed heat strips (up to 1600 DC)
- Microprocessor-controlled thermoregulator
- Ceramic hearth plates
- High-quality, ecological thermal insulation material
- Low electric power usage
- Short heating up period
- High degree of accuracy
- Exterior painted with powder coating (RAL 7035)
- Black furnace frame (on models 7,2/1200 & 7,2/1300)
- Up to a 24 month guaranty period.



Model	Vol. l	T max. °C	Chambre DIM. (mm)			Overall DIM. (mm)			Power (kW)	Voltage (V)	Weight (Kg)
			Width	Length	Height	Width	Length	Height			
MSF 12/40	40	1200	290	420	290	640	800	830	3.4	230	100
MSF 13/30	30	1300	200	450	290	640	870	830	4.6	230	120



**ELF 11 Series, Chamber Furnace 1100°C. 6, 14 Or 23 Liter**

An economical furnace designed for light duty and general laboratory work. Low thermal mass insulation & multiple semi-embedded, free radiating wire wound elements in the chamber sides provide efficient heating. Ventilation is via a top-mounted ceramic chimney, but if toxic or corrosive fumes are likely, use of one of our dedicated ashing furnaces or a retort should be considered.

**Standard Features:**

- 1100°C max. operating temp.
- 6, 14 or 23 Liter chamber volumes
- Tilt forward, drop down door, with air gap to minimise external temperature.
- Controller, PID with single ramp to set-point facility
- Delayed start & process timer function as



standard • Vacuum formed, low thermal mass insulation • Hard ceramic hearth fitted as standard • Ventilated, via top mounted ceramic chimney • Thermocouple type K.

**Options:** Over-temperature protection (recommended to protect valuable contents & for unattended operation).

Model	Max. temp (°C)	Heat up time (min)	Dimensions		Temp. uniformity of 5°C within (mm)	Vol. (Liters)	Max power (W)		Weight (kg)	Power supply
			Inside (mm)	Outside(mm)			Holding power (W)			
ELF 11/6B	1100	35	H165xW180xD210	H580xW410xD420	H115xW130xD130	6	2000 900	24	230V single phase	
ELF 11/14B	1100	40	H210xW220xD310	H630xW450xD520	H130xW140xD220	14	2600 1300	31	Single or 3 phase	
ELF 11/23B	1100	29	H235xW255xD400	H715xW505xD690	H665xW455xD610	23	5000 1500	52	Single or 3 phase	

Continuous operating temperature is 100°C below maximum temperature. Holding power is measured at continuous operating temperature. External dimensions with door closed and include chimney.

**CWF Series, Chamber Furnace 1100°C, 1200°C, 1300°C. 5, 13 Or 23 Liter**

A modern design is combined with traditional know-how & technology, to provide a robust & reliable furnace. Easy to access replaceable heating modules makes maintenance simple

**Standard Features:**

- 1100°C, 1200°C or 1300°C maximum operating temperature
- 5, 13 or 23 Liter chamber volumes
- Up & away door, keeps heated surface away from the user
- PID controller, with single ramp to set-point facility
- Delayed start & process timer function
- Hard wearing alumina element carriers, entrance & hearth
- Energy efficient low thermal mass insulation
- Free radiating wire wound elements, pitched for optimum uniformity
- Easy access to elements & controls, simplifies maintenance & servicing.

**Options:** Over-temperature protection (recommended to protect valuable contents & for unattended operation) • 2 phase supply • 8 or 20 segment programmer • RS232 communications • A variety of retorts & modifications are available for working with modified atmospheres.



Model	Max temp (°C)	Heat up time (mins)	Dimension		Temp. uniformity of 5°C within (mm)	Vol. (Liters)	Max power (W)		Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) (door open)			Holding power (W)				
CWF 11/5	1100	30	H135xW140xD250	H585xW375xD485 (800)	H85xW90xD110	5	2400 790	K	30	230V single phase	
CWF 11/13	1100	80	H200xW200xD325	H655xW435xD610 (905)	H120xW120xD185	13	3100 1500	K	47	230V single or 2 phase	
CWF 11/23	1100	40	H235xW245xD400	H705xW505xD675 (990)	H155xW165xD285	23	7000 1900	K	68	Universal	
CWF 12/5	1200	35	H135xW140xD250	H585xW375xD485 (800)	H85xW90xD125	5	2400 850	R	30	230V single phase	
CWF 12/13	1200	65	H200xW200xD325	H655xW435xD610 (905)	H120xW120xD200	13	3100 1550	R	47	230V single or 2 phase	
CWF 12/23	1200	45	H235xW245xD400	H705xW505xD675 (990)	H155xW165xD325	23	7000 2250	R	68	Universal	
CWF 13/5	1300	40	H135xW140xD250	H585xW375xD485 (800)	H85xW90xD150	5	2400 1000	R	30	230V single phase	
CWF 13/13	1300	80	H200xW200xD325	H655xW435xD610 (905)	H120xW120xD225	13	3100 1800	R	47	230V single or 2 phase	
CWF 13/23	1300	55	H235xW245xD400	H705xW505xD675 (990)	H155xW165xD340	23	7000 2500	R	68	Universal	

"Universal" models are easily altered between single phase(220V), 3 phase+neutral (e.g. 380/220V) & delta (e.g. 220V) electrical supplies. Continuous operating temperature is 100°C below maximum temp. Holding power is measured at the continuous operating temp.



RWF 12/5

### RWF Series, 1400°C, 1500°C, 1600°C, High Temp Furnaces, Rapid Heating Chamber Furnaces

Free radiating wire-wound elements and highly efficient low thermal mass insulation are combined to provide a furnace for light to medium laboratory applications where rapid thermal response is important.

#### Standard Features:

- 1100°C or 1200°C maximum operating temperature.
- 5, 13, or 23 Liter chamber volumes.
- Ambient to 1100°C in as little as 10 minutes
- Rapid thermal response from free radiating coiled wire elements
- Low thermal mass insulation for fast response & energy efficiency
- Up & away door keeps heated surface away from the user
- 301 controller with single ramp to set-point & process timer
- Hard wearing, dust free hearth
- Easy access to elements & controls simplifies maintenance & servicing.

**Options:** Over-temperature protection (recommended to protect valuable contents & for unattended operation) • 2 phase supply at no extra cost above 13 Liters • 8 or 20 segment programmer • RS232 communications • A variety of retorts & modifications is available for working with modified atmospheres.

Model	Max temp (°C)	Heat up time (mins)	Dimension		Volume (Liters)	Max power (W)		Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) (door open)		Holding power (W)				
RWF 11/5	1100	10	H130xW160xD250	H585xW375xD485 (800)	5	2750 680		K	28	230V single phase
RWF 11/13	1100	11	H195xW210xD325	H655xW435xD610 (905)	13	5000 1200		K	45	230V single or 2 phase
RWF 11/23	1100	13	H220xW260xD400	H705xW505xD675 (990)	23	9100 1800		K	65	Universal
RWF 12/5	1200	12	H130xW160xD250	H585xW375xD485 (800)	5	2750 820		R	28	230V single phase
RWF 12/13	1200	13	H195xW210xD325	H655xW435xD610 (905)	13	5000 1450		R	45	230V single or 2 phase
RWF 12/23	1200	15	H220xW260xD400	H705xW505xD675 (990)	23	9100 2100		R	65	Universal

"Universal" models are easily altered between single phase(220V), 3 phase+neutral (e.g. 380/220V) & delta (e.g. 220V) electrical supplies. Continuous operating temperature is 100°C below maximum temp. Holding power is measured at the continuous operating temp.



GPC 12/36

### GPC Series, 1200°C, 1300°C, large Capacity laboratory Chamber Furnaces

Designed for general workshop and laboratory use, the GPC range has the styling and features of the laboratory furnace range with the advantages of a larger chamber size and higher loading capacity.

#### Standard Features:

- 1200°C or 1300°C maximum operating temperature.
- 36, 65, 131, or 200 Liter chamber volumes.
- Free radiating coiled wire elements
- Low thermal mass insulation for fast response & energy efficiency
- Up & away door, keeps heated surface away from the user
- Controller, with single ramp to set-point & process timer
- Hard wearing refractory hearth plate, resists damage & supports heavier loads
- Heating elements are easily serviced from the front of the chamber.

**Options:** Over-temperature protection (recommended to protect valuable contents & for unattended operation) • 8 or 20 segment programmer • RS232 communications • A range of inconel (NiCr) retorts to work with modified atmospheres up to 1100°C.

Model	Max temp (°C)	Heat up time (mins)	Dimension		Volume (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply	
			Inside (mm)	Outside (mm) (door open)						
GPC 12/36	1200	37	H250xW320xD450	H810xW690xD780 (1105)	36	9000		R	100	Universal
GPC 12/65	1200	40	H278xW388xD595	H885xW780xD945 (1245)	65	14000		R	165	3 phase
GPC 12/131	1200	150	H350xW500xD750	H1652xW1110xD1280 (2310) Floorstanding	131	18000		R	400	3 phase
GPC 12/200	1200	-	H400xW600xD900	H1702xW1350xD1350 (2410) Floorstanding	200	24000		R	518	3 phase
GPC 13/36	1300	47	H250xW320xD450	H810xW690xD780 (1105)	36	9000		R	120	Universal
GPC 13/65	1300	45	H278xW388xD595	H885xW780xD945 (1245)	65	14000		R	165	3 phase
GPC 13/131	1300	-	H350xW500xD750	H1652xW1110xD1280 (2310) Floorstanding	131	18000		R	400	3 phase

"Universal" models are easily altered between single phase(220V), 3 phase+neutral (e.g. 380/220V) & delta (e.g. 220V) electrical supplies. Continuous operating temperature is 100°C below maximum temp. Holding power is measured at the continuous operating temp.



RHF 16/3/3508P1

**RHF Series, 1400°C, 1500°C, 1600°C, High Temp Silicon Carbide Heated Furnaces**

Typically reaching 1400°C in under 40 minutes the RHF range provides rapid heating and is ideally suited to the rigorous firing cycles demanded from laboratory furnaces.

**Standard Features:**

- 1400°C, 1500°C or 1600°C maximum operating temperature.
- 3, 8, 15 or 35 Liter chamber volumes.
- Silicon carbide heating elements, providing long life at elevated temperatures & able to with stand the stresses of intermittent operation.
- PID controller, with single ramp to set-point & process timer.
- Controllers extend heating performance by compensating for the effects of element ageing.
- Hard wearing refractory brick hearth and door surrounds.
- Low thermal mass chamber insulation for energy efficiency & rapid heating & cooling.
- Thermocouple type R.

**Options:**

- 2 phase electrical supply for 3 Liter models (& for RHF 14/8)
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- 8 or 20 segment programmer
- RS232 communications
- A range of furnace tables & floor stands are available.

**Power Supplies for Silicon Carbide Furnaces:**

The characteristics of the control systems that are used with silicon carbide elements result in maximum power supply requirements that are not as intuitively derived as those for furnaces using other heating technologies. For this reason a more detailed description of the maximum power supply that is required per phase has been included in the specification table.

Model	Max temp (°C)	Heat up time (mins)	Dimension		Vol. (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply required per phase
			Inside (mm)	Outside (mm)					
RHF 14/3	1400	33	H120xW120xD205	H655xW435xD610 (905)	2.9	1900 4500	R	42	a1=30A, a2=15A
RHF 14/8	1400	22	H170xW170xD270	H705xW505xD675 (990)	7.8	3200 8000	R	64	a1=50A, a2=25A
RHF 14/15	1400	35	H220xD220xD310	H810xW690xD780 (1105)	15	2900 10000	R	125	a1=62A, h3=22A d3=38A
RHF 14/35	1400	38	H250xW300xD465	H885xW780xD945 (1245)	35	6000 16000	R	179	h3=35A, d3=60A k3=35A
RHF 15/3	1500	45	H120xW120xD205	H655xW435xD610 (905)	2.9	2000 4500	R	46	a1=36A, a2=18A
RHF 15/8	1500	40	H170xW170xD270	H705xW505xD675 (990)	7.8	3500 8000	R	61	h3=17.5A, d3=30A b3=38A, g3=17.5A
RHF 15/15	1500	46	H220xW220xD310	H810xW690xD780 (1105)	15	3000 10000	R	125	a1=75A, h3=25A e3=43A
RHF 15/35	1500	46	H250xW300xD465	H885xW780xD945 (1245)	35	6200 16000	R	178	h3=35A, e3=60A g3=35A, j3=5A
RHF 16/3	1600	42	H120xW120xD205	H655xW435xD610 (905)	2.9	2300 4500	R	42	a1=36A, a2=8A a3=30A
RHF 16/8	1600	35	H170xW170xD270	H705xW505xD675 (990)	7.8	4000 8000	R	61	h3=18A, e3=29A b3=34A, g3=18A k3=18A
RHF 16/15	1600	58	H220xW220xD310	H810xW690xD780 (1105)	15	3500 10000	R	140	a1=73A, h3=25A a3=42A, k3=25A
RHF 16/35	1600	56	H250xW300xD465	H1530xW900xD1020 (1245)	35	1100 16000	R	270	h3=40A, e3=62A g3=37A, k3=40A

a1=Single 200-240V, a2=380-415V 2 phase + N, a3=200-240V 3 phase delta, b3=200-208V 3 phase delta, d3=200-220V 3 phase delta, e3=230-240V 3 phase delta, g3=380-415V 3 phase no N, h3=380-415V 3 phase + N, j3=440-480V 3 phase no N, k3=440-480V 3 phase + N.

Continuous operating temp. is 100°C below maximum temp. Holding power is measured at the continuous operating temp.



HTF 17/10

keeps hot face away from user

- Compatible with intermittent or continuous use
- Advanced refractory interior, used in combination with energy efficient low thermal mass insulation
- 8 Segment programmable controller with separate over-temperature protection
- Digital RS232 communications (HTF17/5, HTF17/10, HTF18/4 & HTF18/8)
- Fan cooling for low external case temperature.

#### Options:

- Optional 2 phase electrical supply for 3 Liter models (& for RHF 14/8)
- 20 Segment programmable controller
- RS232 & RS485 communications (RHF17/25, HTF18/15 & HTF18/27)
- Fieldbus & Ethernet connectivity
- A range of data acquisition devices & chart recorders.

#### HTF Series, 1700°C, 1800°C, High Temperature Chamber Furnaces

Suitable for either intermittent or continuous operations, these furnaces provide dependable high temperature performance with programmable control and over temperature protection as standard.

#### Standard Features:

- 1700°C or 1800°C maximum operating temperature.
- From 4 to 27 Liter capacities
- Outstanding performance from molybdenum disilicide heating elements
- Up & away parallel opening door



HTF 18/27

Model	Max temp (°C)	Heat up time (mins)	Dimension		Volume (Liters)	Max power (W)	Digital RS232 Comms	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm)						
HTF 17/5	1700	50	H158xW150xD225	H565xW830xD650 (850)	5	4050	Standard	B	109	Single phase
HTF 17/10	1700	44	H227xW200xD225	H565xW830xD650 (850)	10	5920	Standard	B	176	single or 2 phase
HTF 17/25	1700	45	H300xW275xD300	H1800xW1100xD680 (2600) Floor	25	9600	Option	B	515	3 phase
HTF 18/4	1800	65	H140xW140xD190	H565xW830xD650 (850)	4	4650	Standard	20/40	175	Single phase
HTF 18/8	1800	56	H210xW190xD190	H565xW830xD650 (1105)	8	6200	Standard	20/40	331	single or 2 phase
HTF 18/15	1800	70	H220xW220xD300	H1580xW690xD800 (1105) Floor	15	7900	Option	20/40	365	single, 2 or 3 phase
HTF 18/27	1800	55	H300xW300xD300	H1610xW780xD945 (1245) Floor	27	8180	Option	20/40	509	3 phase

Continuous operating temperature is 100°C below maximum temperature.





AAF 11/7

### AAF-11 Series, 1100°C Ashing Furnaces. 3, 7 Or 18 Liter

- 1100°C maximum operating temperature
- Ideal for ashing foods, plastics, coal & other hydrocarbon materials
- Designed to comply with BS 1016-104.4: 1998, ISO 1171:1997, ASTM D2361-02, & ASTM D3174-04 (3 & 7 Liter models only)
- Wire elements are protected from chemical & mechanical damage by a hard wearing alumina based liner
- AAF 11/18 offers increased protection of the elements from carbon & corrosive atmospheres using silicon carbide tiles
- Air inlet & tall chimney give airflow from 4 to 5 changes per minute
- Low chamber height holds airflow close to samples for optimum combustion
- Powerful elements with graded winding compensate for heat loss due to high airflow
- Preheating of air before it enters the chamber gives excellent uniformity
- Large floor area allows for large number of samples
- AAF 11/18 has two tier shelf doubling sample capacity
- Racks & hearth trays as below.

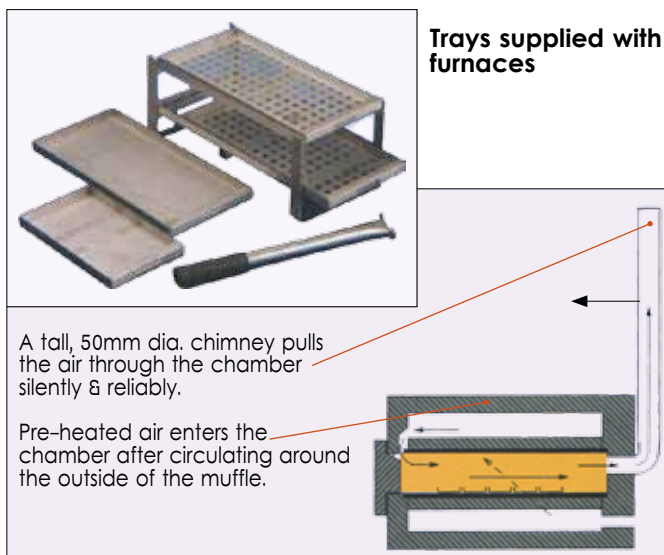
**Options:** 2 phase electrical supply for AAF 11/7.

Model	Max temp (°C)	Heat up time (mins)	Dimensions		Vol. (Liters)	Max power (W) Holding power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) H (door open)					
AAF 11/3	1100	140	H90xW150xD250	H585xW375xD485 (800) 780 height to top of chimney	3	2100 1270	K	22	Single
AAF 11/7	1100	155	H90xW170xD455	H650xW430xD740 (905) 1060 height to top of chimney	7	4000 2300	K	63	Single 2 phase
AAF 11/18	1100	70	H235xW196xD400	H705xW505xD675 (990) 1015 height to top of chimney	18	7080 3500	K	70	Universal

Continuous operating temp. is 100°C below maximum temp. Holding power is measured at the continuous operating temperature.

#### Standard accessories:

Model	2 tier rack system for sample trays with 80mm gap	Non-perforated sample trays (qty) W x D (mm)	Perforated sample trays (qty) W x D (mm)	Loading handle
AAF 11/3	-	(x1) 133x200	-	(x1)
AAF 11/7	-	(x1) 163x326	-	(x1)
AAF 11/18	(x1)	-	(x2) 163x326	(x1)





**AAF 12/18**

### AAF Series, 1100°C Ashing-Plus Furnaces. 18 Liter

- 1200°C maximum operating temperature
- Ideal for ashing foods, plastics, coal & other hydrocarbon materials
- The higher operating temperature makes this a flexible general purpose furnace also suitable for standards compliant ashing.
- Silicon carbide tile protect the elements from carbon & corrosive atmospheres
- Air inlet & tall chimney give high airflow
- Powerful elements with graded winding compensate for heat loss due to high airflow
- Preheating of air before it enters the chamber gives excellent uniformity
- Large floor area allows for large number of samples
- AAF 12/18 has 2 tier shelf doubling sample capacity.

### Standard accessories: (for use 1000°C only)

Model	2 tier rack system for sample trays with 80mm gap	perforated sample trays(gty) W x D (mm)	Loading handle
<b>AAF 12/18</b>	(x1)	(x2) 163x326	(x1)



**Accessory sample tray & rack**

Model	Max temp (°C)	Heat up time (mins)	Dimensions		Vol. (Liters)	Max power (W)		Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) H (door open)		Holding power (W)				
<b>AAF 12/18</b>	1200	70	H235xW196xD400	H705xW505xD675 (990) 1015 height to top of chimney Bench mounted	18	7080 3500		K	70	Universal

"Universal" models are easily altered between single phase (220V), 3 phase + neutral (e.g. 380/220V) and delta (e.g. 220V) Continuous operating-temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating-temperature.



**BWF 11/13**

### BWF Series, 1100°C, 1200°C, 13 Liter, Ashing & Burn-off Furnaces

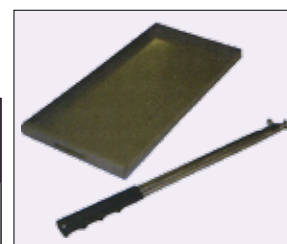
- 1100°C or 1200°C maximum operating-temperature
- Ideal for ashing larger samples or working with non-standard crucibles
- Good uniformity & compensation for heat loss from graded wire wound elements in side mounted, hard wearing alumina carriers
- Excellent resistance to wear from refractory brick door surround & hearth
- Enhanced airflow from high chimney & door vents for full combustion.

### Options:

- Optional 2 phase electrical supply
- Optional racks & hearth trays as below.

### Optional accessories: (for use 1000°C only)

Model	Non-perforated Inconel sample trays (gty) W x D (mm)	Loading handle
<b>BWF 11/13</b>	(x1) 163x326	(x1)
<b>BWF 12/13</b>	(x1) 163x326	(x1)



**Accessory sample tray & loading handle**

Model	Max temp (°C)	Heat up time (mins)	Dimensions		Vol. (Liters)	Max power (W)		Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) H (door open)		Holding power (W)				
<b>BWF 11/13</b>	1100	115	H200xW200xD325	H655xW435xD610 (905) 800 height to top of chimney	13	3100 1200		K	47	Single
<b>BWF 12/13</b>	1200	130	H200xW200xD325	H655xW435xD610 (905) 800 height to top of chimney	13	3100 1500		K	47	Single/ 2 phase

Continuous operating-temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating-temperature.



ABF 8/28

**ABF 8/28, 800°C, Afterburner Ashing Furnace**

The ABF 8/28 offers a 28 Liter chamber with large floor space and a fan assisted pre-exhaust afterburner to combust smoke before it exits from the chimney.

**Standard Features:**

- 800°C maximum operating temperature - ashing chamber
- 28 Liter chamber volume
- Afterburner rated for up to 40g carbon per ashing load
- 3216P1 Programmable controller
- Independent control of afterburner temperature up to 950°C
- Silicon carbide shielded wire wound elements
- Silicon carbide hearth
- Mesh sample trays & loading handle.

**Options:**

- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- Optional dual level rack and sample trays
- Optional three phase operation
- Optional floor stand.

**Accessories:** Supplied with 2 tier stacking mesh sample trays (each 60x270x300) H x W x Dmm & loading handle.

Model	Max temp (°C)	Dimensions		Vol. (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply
		Inside (mm)	Outside (mm)					
ABF 8/28	800	H210xW290xD445	H980xW600xD750 1160 (inc. chimney 180)	28	8000 3828	K	120	Universal

"Universal" models are easily altered between single phase (220V), 3 phase + neutral (e.g. 380/220V) and delta (e.g. 220V) electrical supplies. Holding power is measured at 500°C.



GSM 11/8

**GSM 11/8, 1100°C, Ashing & Burn-off Furnace**

**For advice on managing corrosive or aggressive materials (within your furnace), please contact MRC**

**Standard Features:**

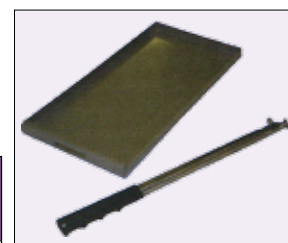
- 1100°C maximum operating temperature
- Fused quartz furnace chamber, ideal for analyses where  $Al_2O_3$  or  $SiO_2$  could contaminate test results
- Chamber lining offers superior containment of corrosive & aggressive vaporous such as  $H_2SO_4$ ,  $HNO_3$ , HCL
- Moulded ceramic fibre door plug.

**Options:**

- Gas Inlet for modified atmospheres (the fused quartz liner provides improved containment)
- Sample trays & racks as below.

**Optional accessories:**

Model	Non-perforated Inconel sample trays (qty) W x D (mm)	Loading handle
GSM 11/8	(x1) 163x326	(x1)



Accessory sample tray &amp; loading handle

Model	Max temp (°C)	Heat up time (mins)	Dimensions		Vol. (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm)					
GSM 11/8	1100	70	H120xW175xD345	H655xW435xD750 (895) 1060mm height to top of chimney	8	3050 1700	K	57	Single

Continuous operating-temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating-temperature. The maximum depth to accommodate the door opening arc is 810mm.



CDF 15/1B

**Options:**

- Over-temperature protection (recommended to protect valuable contents or for unattended operation)
- More advanced programmer options for more programs or more complex temperature profiles
- Argon atmosphere kit enabling samples to be processed under argon (or other inert gas)
- Spare sinter trays
- Spare sinter support beads
- RS 232 Control.



**CDF/CDR Series, Dental Zirconia Sintering Furnaces, 1530°C**

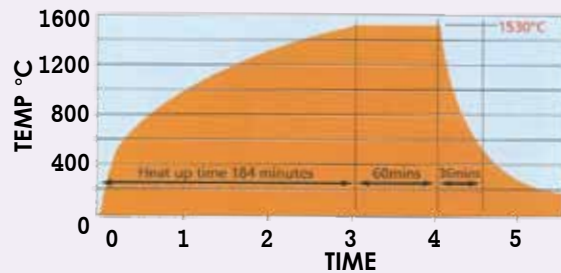
**CDF - Features:**

- Optimized for operation from a standard 13A or 16A single phase mains supply
- Uniform heating from non-contaminating silicon carbide elements
- Flexible programming of temperature profiles using 3216P1 controller
- Timed programmable operation for overnight processing
- Highly uniform, accurately heated working zone
- Complete with sintering tray & 200g of zirconium support beads 2mmØ.

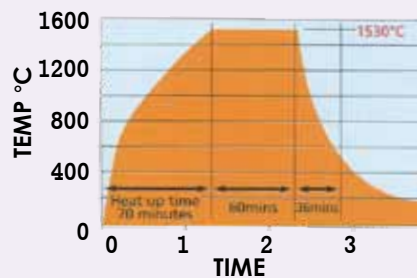
**CDR - Features:**

- Provides rapid sintering in under 3 hours
- 1530°C in 70 minutes (on 16A supply)
- Non-contaminating silicon carbide elements
- Fast forced air cooling
- 1 Liter capacity chamber
- Complete with sintering tray & 200g of zirconium support beads 2mmØ
- Ideal for small crowns & frameworks.

**CDR 15/1 Rapid Cycle Furnace on 13A Mains Supply:**



**CDR 15/1 Rapid Cycle Furnace on 16A Mains Supply:**



Model	CDF/15/1B	CDR/15/1
Max. temp. (°C)	1530	1530
Time to max. (mins)	126‡	70*
Internal H x W x D(mm)	80x90x150	80x90x150
External H x W x D(mm)	655x382x535	655x382x535
Max. power (W)	1 3094	1 3680
Holding power (W)	1145	1145*
Weight (kg)	42	45
Power supply	13A‡ or 16A single phase	13A or 16A* single phase

‡ Heating rate achieved on a 13A mains supply  
 \* Heating rate achieved on a 16A mains supply



FUR-8



**FUR-8-80 Series, Universal Electrical Furnaces**

- Universal electrical furnaces are designed for burning of ceramics, china and stone mass, thermal processing of small metal particles in the ambience at the maximum temperature of 1260°C.
- Furnaces are used in laboratories, educational institutions, ceramics and jewelry workshops, dentists offices, and metal thermal processing shops.

Model	FUR-8	FUR-25	FUR-50	FUR-80
Dim.(mm)	190x160x260	250x250x400	400x300x400	400x600x400
Power kW	2.5	3.4	4.2	6
Volume L	8	25	50	80
Temp. °C	1260			
Voltage V	220	220	220	400



FUR-100



**FUR-100-1500 Series, Chamber Furnaces**

- Furnaces of this type are designed for industrial burning of clay, stone mass and china in the ambience of air at the maximum temperature of 1280°C. These furnaces are also used for glazing of ceramic products and firing of ornaments.
- Chamber type furnaces are used for thermal processing of metal parts of large dimensions.

Model	FUR-100	FUR-150	FUR-200	FUR-300	FUR-500	FUR-750	FUR-1000	FUR-1500
Chamber dim. (mm)	400x500x400	500x600x500	500x700x600	600x850x600	600x900x900	900x900x900	900x1200x900	1000x1200x1300
Power kW	9	12	15	18	36	45	57	75
Volume L	100	150	200	300	500	750	1000	1500
Temp. °C	1260							
Voltage V	400							



### M30/12 / M200/13 Series, Circular Furnaces

Especially for "hobby" ceramic shops. but also for professional ceramics burning which need to be charged into the furnace from the top. The shape and design ensure a perfect temperature distribution and possibility of fast rise to desired temperature.

Furnace shell is made of polished stainless steel sheet metal. The use of top insulating materials reduces energy consumption. Matter of course is perfect workshop processing. hardware and smooth and safe operation.

#### Standard design of furnace:

- Ht40 AL controller
- Stand with height setting
- Wheels (2pcs).

#### Accessories for an additional charge:

- Ht40 AL or Bentrup TC44 controller
- Desk for the bottom of the furnace
- Distance columns
- Calibration of the controller measuring entry.



Model	M30/12	M45/12	M60/12	M100/12	M125/12	M200/12	M30/13	M45/13	M60/13	M100/13	M125/13	M200/13
Max. Temp. (°C)	1280	1280	1280	1280	1280	1280	1340	1340	1340	1340	1340	1340
Internal Temp. distribution	10°C											
Volume L	30	45	60	100	125	200	30	45	60	100	125	200
External Dim.(mm)	550x495	615x495	615x610	725x610	820x610	820x840	550x495	615x495	615x610	725x610	820x610	820x840
Internal Dim.(mm)	350x340	410x340	410x455	525x455	620x455	620x685	350x340	410x340	410x455	525x455	620x455	620x685
Input (kW)	3.5	3.5	5.5	7.5	8.5	11	3.5	3.5	5.5	7.5	8.5	11
Weight (kg)	65	75	90	120	130	150	65	75	90	120	130	150
Total height of stand(mm)	640/800	640/800	760/920	760/920	760/920	990/1150	640/800	640/800	760/920	760/920	760/920	990/1150
Voltage (V)	230	230	400	400	400	400	230	230	400	400	400	400
Furnace Protection	16/1											

\* Proportions of the cylindrical furnace body with the lid. \* Controller: Ht40 AL



### Ht40 AL, Temperature controller

Electric resistance furnaces manufactured by MRC Ltd. are fitted with the following types of high-quality PID controllers: Ht40 AL. Ht Ceramic or INDUSTRY. These types of controllers are microprocessor-controlled devices meeting all the requirements for temperature control & the security of electro-thermal devices. On request can be some types of furnaces fitted with Bentrup TC 44 regulators.

- The device allows the controlling of the temperature to a constant value or by the program (1 program)
- The regulation to a constant value can be disabled
- The program can be launched with a defined time delay
- Measurement accuracy of  $\pm 0.1\%$  from the measuring scope (min. 540°C).
- regulation accuracy of  $\pm 1^\circ\text{C}$
- One auxiliary output for controlling an additional function - end of program signal. program operation signal.

end of program signal • Configurable alarm output (limit temperature monitoring) • The controller can be equipped with a RS232 or RS485 serial communication line • The device can be connected to a PC using the Series communication line. and the course of the measured and desired temperatures can be displayed on a PC using the HtMonit software (the temperature course can be stored in the memory of a PC) • Automatic setup of the PID parameters of the control loop.



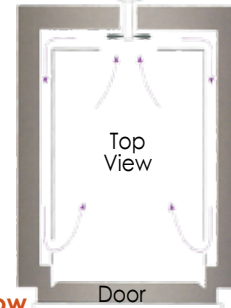
HRF 7/22/301

**HRF-7 Series, 750°C, 22, 45, 112, Or 324 Liter, Air Recirculating Chamber Furnaces**

A powerful fan and air guide system provide good uniformity and rapid heat transfer for applications such as; stress relieving, tempering, normalizing and annealing. The stainless steel liner has 3 shelf runners with shelves available as an additional option.

**Standard Features:**

- 750°C maximum operating temperature
- 22, 45, 112 or 324 Liter chamber volumes
- Resistance wire elements in both sides of chamber
- Stainless steel liner
- Combination of low thermal mass and refractory board insulation
- Controller, with single ramp to set-point & process timer
- Safe outer case temperature.



Air Flow

**Options:**

- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- 8 or 20 segment programmer
- RS232 communications
- Shelves & runners.

Model	Max temp (°C)	Heat up time (mins)	Dimension		Shelves fitted/ accepted	Volume (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm)						
HRF 7/22	750	63	H220xW200xD495	H590xW450xD870	0/3	22	3000	K	61	Single phase
HRF 7/45	750	-	H295xW265xD560	H840xW600xD1000	0/3	45	6000	K	-	Optional 3 phase
HRF 7/112	750	-	H400xD400xD700	H1550xW1000xD1600	0/0	112	18000	K	480	3 phase
HRF 7/324	750	-	H600xW600xD900	H1800xW1200xD2280	1/1	324	24000	K	1000	3 phase

External dimensions with door closed and include chimney. HRF 7/33 and HRF 7/45 have 3 integral shelf runners.



VCF 12/5/3508/P10

**VCF-12 Series, 1200°C, 5, 10, 23, Or 100 Liter, Top Loading Laboratory Chamber Furnaces**

A floor standing furnace design which is particularly suitable for applications involving tall crucibles or heavy samples, where the top loading format makes sample handling much easier.

**Standard Features:**

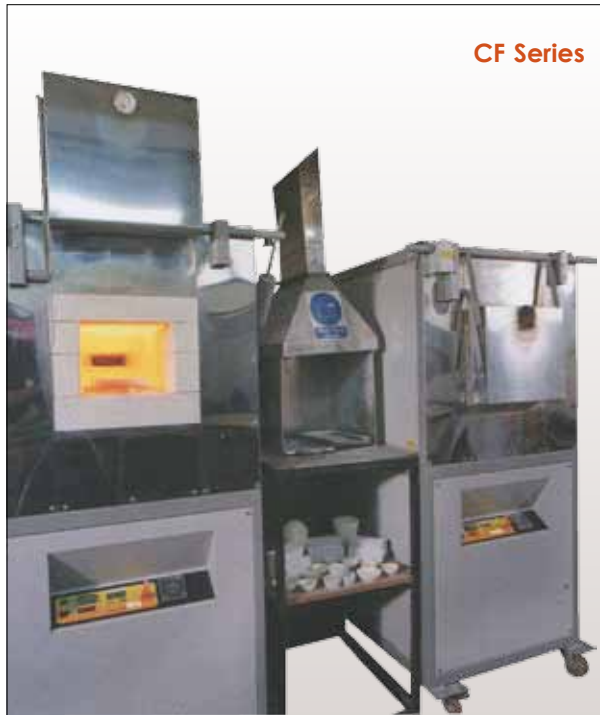
- 1200°C maximum operating temperature
- 5, 10, 23 or 100 Liter chamber volumes
- Free radiating wire elements in all 4 sides of chamber
- Vented top opening door
- Angled control panel, protected but clearly visible
- 301 controller, with single ramp to set-point & process timer
- Thermocouple protected by ceramic sheath
- Top accessible elements for easy servicing.

**Options:**

- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- 8 or 20 segment programmer
- RS232 communications.

Model	Max temp (°C)	Heat up time (mins)	Dimension		Volume (Liters)	Max power (W) Holding power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm) (door open)					
VCF 12/5	1200	102	H260xW155xD130	H660xW530xD405 Floorstanding	5	2500 900	R	50	Single phase
VCF 12/10	1200	138	H365xW180xD155	H765xW555xD430 (910) Floorstanding	10	3000 1200	R	60	Single phase
VCF 12/23	1200	125	H450xD250xD200	H850xW600xD500 850+105(inc. handle) Floorstanding	23	6000 2500	R	130	Optional Universal
VCF 12/100	1200	150	H600xW410xD410	H1100xW930xD950 1250+210(inc. chimney) Floorstanding	100	15000 6000	R	200	3 phase

"Universal" models are easily altered between single phase(220V), 3 phase+neutral (e.g. 380/220V) & delta (e.g. 220V) electrical supplies. Continuous operating temperature is 100°C below maximum temp. Holding power is measured at the continuous operating temp.



### CF Series, Cupellation Furnaces for the Assay of Precious Metals

#### Features:

- 1200°C maximum operating temperature
- Models with a maximum charge capacity of 15, 24, 50 or 60 number 8 cupels
- Alternatively 24, 32, 72, or 90 number 6 cupels
- Designed for testing using the cupellation method to ISO11426: 1999 the standard test method used by the United Kingdom Assay Office, a reference quantitative assay method laid down by the International Hallmark Convention
- The CF furnaces are internationally renowned for their close temperature uniformity and hazardous fume control\*
- Airflow controlled by an adjustable valve, is preheated before entering the work chamber
- Silicon carbide elements mounted above & below the chamber provide even heating of cupels, have good resistance to thermal shock & offer extended working life at high temperatures
- Fumes are extracted through insulated exhaust duct, with removable chamber below chimney to collect condensed lead
- Up & away counterbalanced vertically opening door complete with observation hole
- Silicon carbide lined roof & hearth resist the corrosive fumes emitted during the cupellation process
- Includes 7 day, 24 hour time switch.

#### Options:

- Modified configurations are available to fit existing fume extraction systems.

**Note:** The furnace should be positioned beneath an efficient fume extraction system preferably fitted with a proprietary lead filter.

Model	CF 15	CF 24	CF 50	CF 60
Max. temp. (°C)	1200	1200	1200	1200
Internal H x W x D(mm)	125x220x350	205x255x460	230x350x540	250x400x650
External H x W x D(mm)	1059x950x950 (bench mounted) 225x600x380 (Separate control module)	2110x1050x1070 (floor standing)	2100x1150x1100 (floor standing)	2100x1200x1200 (floor standing)
Volume (Liters)	15	24	50	60
Max. power (W)	9000	13000	20000	31000
Thermocouple type	Pt/Pt 13% Rh Type R	Pt/Pt 13% Rh Type R	Pt/Pt 13% Rh Type R	Pt/Pt 13% Rh Type R
Weight (kg)		306		
Power supply required per phase	<b>a1</b> =68A, <b>h3</b> =23A, <b>a3</b> =40A	<b>a1</b> =87A, <b>h3</b> =28A, <b>a3</b> =50A, <b>j3</b> =30A	<b>h3</b> =45A, <b>e3</b> =78A, <b>k3</b> =45A	<b>h3</b> =62A, <b>a3</b> =107A, <b>k3</b> =62A

**a1**=Single 200-240V, **a3**=200-240V 3 phase delta, **e3**=230-240V 3 phase delta, **h3**=380-415V 3 phase+N, **j3**=440-480V 3 phase no N, **k3**=440-480V 3 phase + N.

\* Fumes are extracted through an insertable exhaust duct and removable container below the chimney.





MTF 12/38/250

**MTF Series, Wire Wound Single Zone Tube Furnaces, 1000°C & 1200°C**

Starting with the compact MTF/9 through to the 850mm long MTF 12/38 850, these tube furnaces can be used by placing samples directly into the heated (wire wound) worktube or optional accessory worktubes can be used to protect the element or work with modified atmospheres.

**Features:**

- 1000°C or 1200°C maximum operating temperature
- 15mm, 25mm or 38mm heated tube inner diameters
- 130mm, 250mm, 400mm or 850mm heated tube length
- Integral wire wound worktube
- Control module, with furnace mounted directly on top
- 301 controller, with single ramp to set-point facility
- Delayed start process timer function as standard
- Horizontal tube configuration.

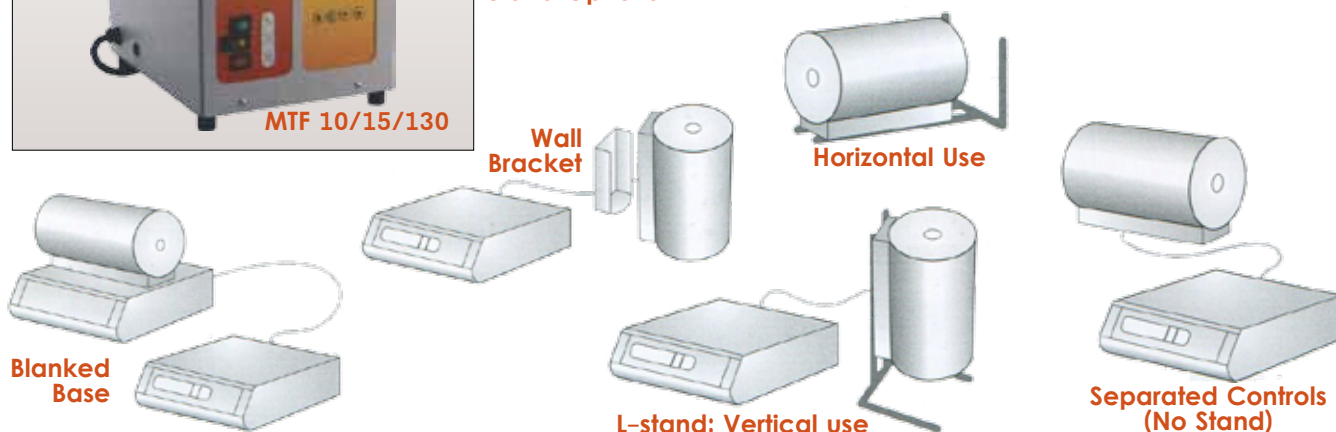


MTF 10/15/130

**Options:**

- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- Non-permeable inner worktube to contain modified atmosphere
- Impervious inner worktube to protect against chemical attack or damage from thermal shock
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity (recommended for vertical use)
- Gas injection & vacuum compatible tube end seal assemblies.

**Stand Options:**



Model	MTF-10/15/130	MTF-10/25/130	MTF-12/25/250	MTF-12/38/250	MTF-12/25/400	MTF-12/38/400	MTF-12/38/850
Max. temp. (°C)	1000	1000	1200	1200	1200	1200	1200
Heat-up time (mins)	5	10	15	25	30	25	-
Tube length (mm)	150	150	300	300	450	450	900
Heated length (mm)	130	130	250	250	400	400	850
Outer measurements excluding tube (mm - HxWxD) +body length (mm)	360x200x223 150	265x150x175 150	375x370x375 300	430x370x375 300	430x450x375 450	430x450x375 450	430x900x375 900
*Uniform length ±5°C (mm)	30	45	60	90	100	130	600
Max. power (W) Holding power (W)	400 100	400 100	700 200	1000 300	1000 200	1500 300	2800
Thermocouple type	K	K	N	N	N	N	N
Weight (kg)	3	3	10	15	10	15	-
Power supply	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase	Single phase

Continuous operating temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating temperature. \*Uniform temperature lengths are measured with end plugs fitted.



CTF 12/65/550

### CTF Series, Wire Wound Single Zone, Horizontal And Vertical Tube Furnaces, 1200°C

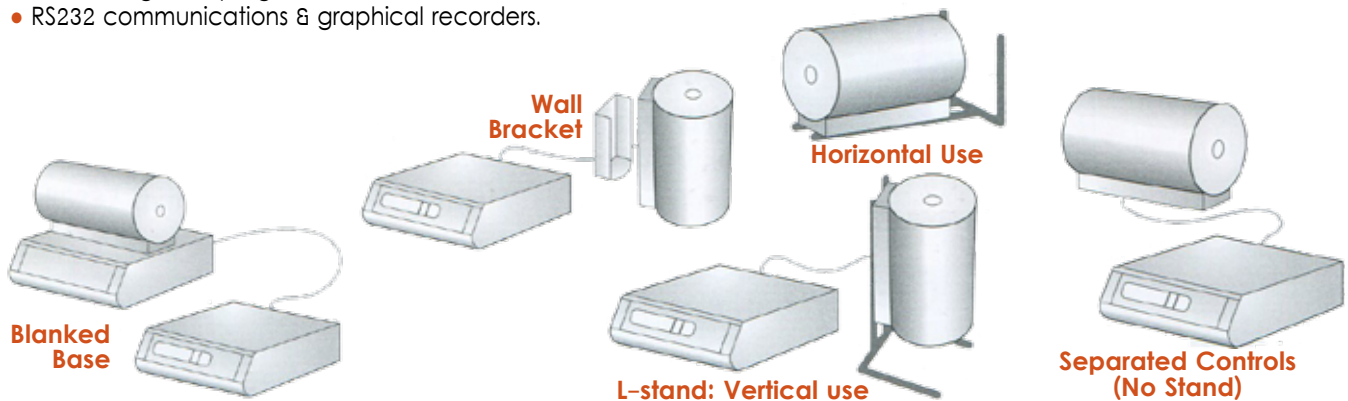
Provides the advantages of a larger diameter and longer worktube than the MTF range, with the option of adding accessory worktubes in order to use modified atmospheres or protect the wire wound element tube.

#### Features:

- 1200°C maximum operating temperature
- 65mm, 75mm or 100mm worktube inner diameters
- 550mm, 700mm or 900mm heated tube length
- Integral wirewound worktube
- 301, PID controller with digital set & display
- Delayed start / process timer function as standard
- Horizontal tube configuration
- Horizontal configuration with furnace located on top of controller base.

#### Options:

- Alternative "blank-base" or 'separated-base' configurations
- Optionally configured for 2 phase electrical supply
- Non-permeable inner worktube to contain modified atmosphere
- Range of impervious inner worktubes to protect against chemical attack or damage from thermal shock
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- Gas injection & vacuum compatible tube end seal assemblies
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- 8 or 20 segment programmer
- RS232 communications & graphical recorders.



Model	CTF-12/65/550	CTF-12/75/700	CTF-12/100/900
Maximum temperature (°C)	1200	1200	1200
Heat-up time (mins)	45	45	90
Tube length (mm)	65	75	100
Heated length (mm)	550	700	900
Outer measurements excluding tube (mm - HxWxD) +body length (mm)	525x626x360 600	525x775x360 750	525x975x360 950
*Uniform length (mm ±5°C)	230	265	640
Max. Power (W)	2000	3000	4500
Thermocouple type	Type N		
Weight (kg)	25	28	35
Power Supply	Single phase or 2 phase	Single phase or 2 phase	Single phase or 2 phase

Continuous operating temperature is 100°C below maximum temperature.

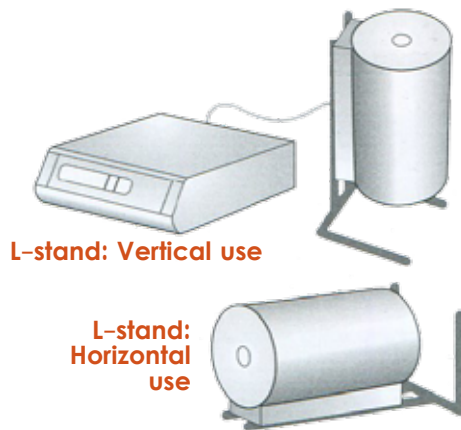
\*Uniform temperature lengths are measured with end plugs fitted.

\*\* To ensure tube end temperatures that are compatible with sealing assemblies, worktubes extending beyond the standard length are required when working with modified atmosphere. Radiation shields may also be required.



TZF 12/75/700/3216P1

Comprising an horizontal furnace body with three zone wire wound worktube element that is equipped as standard with "Back to Back" zone control. It can be used directly or with accessory worktubes.



L-stand: Vertical use

L-stand: Horizontal use

**TZF Series, Wire Wound Horizontal Three Zone Tube Furnaces, 1200°C**

**Features:**

- 1200°C maximum operating temperature
- Excellent uniformity results from division of the heated length into 3 equal zones each with its own controller & thermocouple.
- Provides a longer uniform zone than can be achieved in single zone tube furnace
- Power to the end zones is automatically adjusted to compensate for heat loss
- All three zones are controlled to the same set-point
- Heated lengths of 400, 550, 700 or 900mm
- Models accepting worktubes with outer diameters of 38mm to 90mm
- Horizontally mounted on control module base.

**Options:**

- Shorter end zone option to provide extended uniform length (optionally in 2 phase configuration)
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- Gas injection & vacuum compatible worktube end seal assemblies
- Separate control module on 2 metre or 6 metre conduit
- 'L' style flexible stand option for vertical or independent mounting
- 8 or 20 segment programmer
- 'Retransmission of Setpoint' zone control configuration for programmed cooling
- RS232 communications & graphical recorders
- Alternative furnace sizes can be supplied upon request.

Model	TZF-12/38/400	TZF-12/65/550	TZF-12/75/700	TZF-12/100/900
Max. temp. (°C)	1200	1200	1200	1200
Heat-up time (mins)	25	45	45	120
Max. o/d accessory tube (mm)	38	65	90	90
Heated Tube length (mm)	400	550	700	900
Overall furnace length (mm)	450	600	750	950
External H x W x D (mm) Furnace body length (mm)	430x450x375 450	525x625x360 600	525x775x360 750	525x975x360 950
*Uniform length ±5°C (mm)	305	390	540	754
Max. power (W) Holding power (W)	1175 700	1817 600	2755 800	4150 1000
Thermocouple type	N	N	N	N
Weight (kg)	32	38	46	54
Power supply	Single	Single, 3 phase	Single, 3 phase	Single or Universal

"Universal" models are easily altered between single phase (220V), 3 phase-neutral (e.g. 380/220V) and delta (e.g. 220V) electrical supplies.  
 Continuous operating temperature is 100°C below maximum temperature.  
 Holding power is measured at the continuous operating temperature.  
 Uniform length measured with end plugs fitted.



HST 12/70/600

**HST Series, Horizontal Single Zone Split Tube Furnaces, 1200°C**

**Features:**

- 1200°C maximum operating temperature
- Accepts worktubes with outer diameters up to 110mm
- Heated tube lengths of 200, 300, 400, 600, 900mm
- Furnace splits into two halves to accommodate reactor vessels, large work pieces or samples fixed into a test rig
- Long life, rapid heating, resistance wire elements mounted in rigid, half cylindrical vacuum formed insulation modules
- Control module with 2 metre conduit to furnace
- Controller, with single ramp to set-point facility
- Delayed start / process timer function as standard.

**Options:**

- Non-permeable inner worktubes and end seal assemblies for modified atmosphere
- Impervious inner worktubes to protect against chemical attack or damage from thermal shock
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- Available with 'L' stand kit for vertical or horizontal use
- Wall mounting bracket
- Control module on longer 6 metre conduit
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- 2 phase, 3 phase or "universal" power supply, depending upon model
- 8 or 20 segment programmer
- RS232 communications & graphical recorders.



Requires but does not include an appropriate accessory worktube 19.5mm to 110mm outer diameter. Please specify worktube diameter when ordering split tube furnaces.

Model		HST-12/200	HST-12/300	HST-12/400	HST-12/600	HST-12/900
Max. temp. (°C)		1200	1200	1200	1200	1200
Heat-up time (mins)		45	45	45	45	45
Max. o/d accessory tube (mm)		110	110	110	110	110
Tube/ Worktube length(mm)	Heated/furnace body length(mm)	200/350	300/450	400/550	600/750	900/1050
	For work in air	350	450	550	750	1050
	**For modified atmosphere work	650	750	850	1050	1350
External (inc stand) H x W x D (mm) Control Module (mm)		350x325x410 225x600x380	350x425x410 225x600x380	350x525x410 225x600x380	350x725x410 225x600x380	350x1025x410 225x600x380
*Average Uniform length ±5°C (mm)		100	150	200	300	450
Max. power (W)		1000	1500	2000	3000	4500
Thermocouple type		N	N	N	N	N
Weight (kg)		26	28	32	38	60
Power supply		Single phase or 2 phase	Single, 3 phase or Universal	Universal	Universal	Universal

"Universal" models are easily altered between single phase (220V), 3 phase-neutral (e.g. 380/220V) and delta (e.g. 220V) electrical supplies.

Continuous operating temperature is 100°C below maximum temperature.

\* Average of uniform lengths at 100°C intervals from 800°C to 1200°C, measured with end plugs fitted.

\*\* To ensure tube end temperatures that are compatible with sealing assemblies, worktubes extending beyond the standard length are required when working with modified atmosphere. Radiation shields may also be required.



GHA 12/75/600/301

**Options:**

- Full range of alternative "blank-base" & "separate-base" configurations available
- Non-permeable inner worktubes to contain modified atmosphere
- Impervious inner worktubes to protect against chemical attack or damage from thermal shock
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- Gas injection & vacuum compatible tube end seal assemblies
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- 8 or 20 segment programmer
- RS232 communications & graphical recorders.

**GHA Series, Single Zone Horizontal Tube Furnaces, 1200°C**

A range designed for working using accessory worktubes, whose physical characteristics and chemical resistance can be matched to the specific application. Requires but does not include an appropriate accessory worktube up to 170mm outer diameter.

**Features:**

- 1200°C maximum operating temperature
- Accepts worktubes with outer diameters from 20 to 170mm
- Worktubes with 300, 450, 600, 750, 900, 1050 or 1200mm heated tube length
- Long life, rapid heating, resistance wire elements mounted in rigid, vacuum formed insulation modules
- 301, PID controller with digital set & display
- Delayed start / process timer function as standard
- Horizontal configuration
- Furnace mounted directly on top of controller base unit.



GVA 12/600 Vertical Stand

Model	GHA-12/300	GHA-12/450	GHA-12/600	GHA-12/750	GHA-12/900	GHA-12/1050	GHA-12/1200
<b>Max. temp. (°C)</b>	1200	1200	1200	1200	1200	1200	1200
<b>Heat-up time (mins)</b>	90	97	92	97	-	83	-
<b>Max. o/d accessory tube (mm)</b>	170	170	170	170	170	170	170
<b>Tube/Worktube length(mm)</b>	300 500 900	450 650 1050	600 800 1200	750 950 1350	900 1100 1500	1050 1250 1650	1200 1400 1800
<b>Heated For work in air **For modified atmosphere work</b>							
<b>External H x W x D (mm) Furnace body length (mm)</b>	670x526x468 480	670x676x468 630	670x826x468 780	670x976x468 930	670x1126x468 1080	670x1276x468 1230	670x1426x468 1380
<b>*Average Uniform length ±5°C (mm)</b>	201	262	414	448	-	448	-
<b>Max. power (W)</b>	2300	3100	3900	4600	5400	6200	7000
<b>Thermocouple type</b>	N	N	N	N	N	N	N
<b>Weight (kg)</b>	-	37	40	51	55	-	-
<b>Power supply</b>	Single phase or 2 phase	Single, 3 phase or Universal	Universal	Universal	Universal	Universal	Universal

"Universal" models are easily altered between single phase (220V), 3 phase-neutral (e.g. 380/220V) and delta (e.g. 220V) electrical supplies.

Continuous operating temperature is 100°C below maximum temperature.

\* Average of uniform lengths at 100°C intervals from 800°C to 1200°C, measured with end plugs fitted.

\*\* To ensure tube end temperatures that are compatible with sealing assemblies, worktubes extending beyond the standard length are required when working with modified atmosphere. Radiation shields may also be required.

# F FURNACES Tube, 1200°C, 3 Zone, Large Diameter



**GHC 12/1200/3216P1  
with over temp.**

## GHC Series, Wire Embedded Three Zone Tube Furnaces, 1200°C

Three zone control provides a considerably longer uniform temperature zone than is possible with single zone furnaces. However if a programmed controlled cooling ramp is required then specify the "Retransmission of Setpoint" control option at the time of ordering. Requires but does not include an appropriate accessory worktube up to 170mm outer diameter.

### Features:

- 1200°C maximum operating temperature
- Excellent uniformity results from the heated length divided into 3 zones each with its own controller & thermocouple
- Power to the end zones is automatically adjusted to compensate for heat loss, even without end plugs fitted
- Provides a longer uniform zone than that which can be achieved in a single zone tube furnace
- Heated tube lengths of 450, 600, 750, 900, 1050, or 1380mm
- Accepts accessory worktubes with outer diameter up to 170mm
- All three zones are controlled to the same set-point
- Horizontal configuration with furnace mounted onto control module
- PID controller with single ramp to setpoint & process timer.

### Options:

- End zones of either 150mm or 300mm long
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- Gas injection & vacuum compatible tube end, seal assemblies
- 8 & 20 segment programmable controllers
- RS232 communications & graphical recorders
- "Retransmission of Setpoint" control configuration to facilitate programmed cooling
- Alternative furnace sizes can be supplied upon request.

Model		GHC-12/450	GHC-12/600	GHC-12/750	GHC-12/900	GHC-12/1050	GHC-12/1200
Max. temp. (°C)		1200	1200	1200	1200	1200	1200
Heat-up time (mins)		98	64	74	79	100	-
Max. o/d accessory tube (mm)		170	170	170	170	170	170
Tube/ Worktube length(mm)	Heated For work in air	450	600	750	900	1050	1200
	For modified atmosphere work	750	900	1050	1200	1350	1500
		1050	1200	1350	1500	1650	1800
External H x W x D (mm) Furnace body length (mm)		672x676x468 630	672x827x468 780	672x976x468 930	672x1126x468 1080	672x1276x468 1230	672x1426x468 1380
*Average Uniform length ±5°C (mm)		300	440	500	640	880	-
Max. power (W) Holding power (W)		3100 1500	3900 1800	4600 2200	5400 2800	6200 2800	7000 3100
Thermocouple type		N	N	N	N	N	N
Weight (kg)		6.5	40	40	51	55	-
Power supply		Single phase or Universal	Universal	Universal	Universal	Universal	Universal

"Universal" models are easily altered between single phase (220V), 3 phase-neutral (e.g. 380/220V) and delta (e.g. 220V) electrical supplies.

Continuous operating temperature is 100°C below maximum temperature.

Holding power is measured at the continuous operating temperature.

Uniform length measured with end plugs fitted.



**STF Series, Vertical High Temperature Single Zone Tube Furnaces, 1500°C & 1600°C**

A range of tube furnaces offering the higher temperatures that are available from silicon carbide heating elements, with the additional option of a vertical 'L' stand and separate controller if preferred. The user must select an accessory worktube specific to their application. Requires but does not include an appropriate accessory work tube 19.5mm to either 60mm or 90mm outer diameter

**Features:**

- 1500°C & 1600°C maximum operating temperatures
- Using worktubes of 60 or 90mm outer diameter
- Accepts worktubes with 180, 450 or 610mm heated tube length
- Silicon carbide heating elements
- Horizontal configuration
- Our Controller, with single ramp to set-point facility
- Delayed start / process timer function as standard.

**Options:**

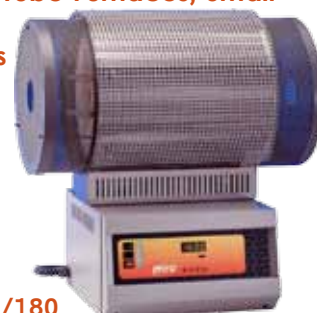
- Available with 'L' stand kit or wall bracket for vertical or horizontal use
- Available in 'Blank-stand' or 'Separate-stand' configurations
- Non-permeable inner worktubes to contain modified atmosphere
- Impervious inner worktubes to protect against chemical attack or damage from thermal shock
- Over-temperature protection (recommended to protect valuable contents & for unattended operation)
- Insulation plugs & radiation shields to prevent heat loss & improve uniformity-recommended for vertical tubes
- Gas injection & vacuum compatible tube end, seal assemblies
- 3 Phase or 'universal' power supply, depending upon model
- 8 or 20 Segment programmer
- RS232 communications & graphical recorders



**STF Series, High Temperature Single Zone Tube Furnaces, Small 1500°C & 1600°C**

**Power Supplies for Silicon Carbide Furnaces**

The characteristics of the control systems that are used with silicon carbide elements result in maximum power supply requirements that are not as intuitively derived as those for furnaces using other heating technologies. For this reason a more detailed description of the maximum power supply that is required per phase has been included in the specification table.



Model	STF-15/180	STF-15/450	STF-15/610	STF-16/180	STF-16/450	STF-16/610
<b>Max. temp. (°C)</b>	1500	1500	1500	1600	1600	1600
<b>Heat-up time (mins)</b>	Rate will vary with state of oxidation and age of elements					
<b>Max. o/d accessory tube (mm)</b>	60	90	90	60	90	90
<b>Tube/ Worktube length(mm) **For modified atmosphere work</b>	180 600 900	450 900 1200	610 1200 1500	180 600 900	450 900 1200	610 1200 1500
<b>External H x W x D (mm) Furnace body length (mm)</b>	500x600x375 600	660x830x445 900	660x1130x445 1200	500x600x375 600	660x830x445 900	660x1130x445 1200
<b>*Uniform length ±10°C (mm)</b>	80	350	400	80	350	400
<b>Max. power (W) Supply Required (W)</b>	- 1500	3800 5500	4200 6000	- 2500	- 6000	- 7000
<b>T/C type</b>	R	R	R	R	R	R
<b>Weight (kg)</b>	29	34	45	29	40	50
<b>Power supply required per phase</b>	<b>a1=12A, d1=24A</b>	<b>a1=39A, a2=19.5A, c3=25A</b>	<b>a1=32A, b1=44A, a2=19.5A, f3=19.5A, a3=34A</b>	<b>a1=23A</b>	<b>a1=47A, a2=24A, h3=21A, a3=39A, g3=21A</b>	<b>a1=50A, a2=25A, h3=25A, i3=27A, d3=43A, e3=46A</b>

**a1**=Single 200-240V, **b1**=Single 200-208V, **d1**=Single 110-120V, **a2**=380-415V 2 phase + N, **a3**=200-240V 3 phase delta, **c3**=200-208V 3 phase+N, **d3**=200-220V 3 phase delta, **e3**=230-240V 3 phase delta, **f3**=Single 220-240V 3 phase+N, **g3**=380-415V 3 phase no N, **h3**=380-415V 3 phase + N, **i3**=400-415V 3 phase+N.

Continuous operating temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating temperature. Uniform length measured with end plugs fitted.

\*\* To ensure tube end temperatures that are compatible with sealing assemblies, worktubes extending beyond the standard length are required when working with modified atmospheres. Radiation shields may also be required.

# F FURNACES High Temp. Tube, 1700°C, 1800°C



CTF 17/75/300/3216P1

## CTF 17/18 Series / PVT Series, High Temp. Horizontal/Vertical Tube Furnaces , 1700°C & 1800°C

### Features:

- 1700°C & 1800°C maximum operating temp.
- molybdenum disilicide elements
- Using worktubes with outer diameters of up to 90mm
- 300mm or 600mm heated tube lengths
- Horizontal configuration
- 8 Segment programmable controller & separate over-temperature protection.

### Options:

- Insulation plugs & radiation shields to prevent heat loss & improve uniformity
- Gas injection & vacuum compatible worktube end, seal assemblies
- Tube supports essential for use with high vacuum seals
- 2 phase or 3 phase or power supply
- 20 segment programmer
- RS232 communications & graphical recorders
- Alternative furnace sizes can be supplied upon request.



Vertical Furnace

Designed for high temperature applications utilizing high temperature RCA (recrystallized alumina) worktubes. Vertical elements heat an horizontal tube. Requires but does not include an appropriate RCA (recrystallized alumina) accessory worktube 19.5mm to 90mm maximum outer diameter.

Model	CTF-17/300	CTF-17/600	CTF-18/300	CTF-18/600
Max. temp. (°C)	1700	1700	1800	1800
Heat-up time (mins)	Rate will vary with state of oxidation and age of elements			
Max. o/d accessory tube(mm)	90	90	90	90
Heated tube length(mm)	300	600	300	600
Overall furnace length (mm)	650	950	650	950
External H x W x D(mm) Furnace body length(mm)	880x720x630 650	880x1020x630 950	945x720x630 650	945x1020x630 950
Uniform length ±5°C (mm)	200	400	200	400
Max. power (W) Holding power (W)	4125 2500	6875 3800	6000 5200	9300 5700
Thermocouple type	B	B	2 <sup>±</sup>	2 <sup>±</sup>
Weight (kg)	126	220	130	230
Power supply	Single phase	Single, 2 or 3 phase	Single phase	Single, 2 or 3 phase

Model	PVT-18/50/200	PVT-18/75/350	PVT-18/100/350	PVT-18/125/350
Max. temp. (°C)	1800	1800	1800	1800
Heat-up time (mins)	Rate will vary with state of oxidation and age of elements			
Max. o/d accessory tube (mm)	60	90	115	140
Heated tube length(mm)	200	350	350	350
External H x W x D(mm) Control module H x W x D(mm)	850x700x810 222x570x375	1000x700x810 222x570x375	1000x700x810 222x570x375	1000x700x810 222x570x375
Furnace body length (mm)	-	-	-	-
Max. power (W) Holding power (W)	5500 4000	9000 5000	6000 5000	9300 7000
Thermocouple type	2 <sup>±</sup>	2 <sup>±</sup>	2 <sup>±</sup>	2 <sup>±</sup>
Weight (kg)	270	300	400	500
Power supply	2 or 3 phase	3 phase	3 phase	3 phase

Continuous operating temperature is 100°C below maximum temperature. Holding power is measured at the continuous operating temperature. Uniform length measured with end plugs fitted. ±A MRC proprietary thermocouple design.





TFV-12NT

**TFV-12NT, Vacuum Tube Furnace, 1200°C**

Model	TFV-12NT
Inside Chamber Size	dia60x300mm (diameter 2.5" x 12")
Standard Working Temp.	1100°C (continuous)
Maximum Working Temp.	1200°C (< 3 hrs)
Temperature Control	30 steps programmable and PID automatic control
Heating Rate	0~10°C/ min (suggestion: =< 10°C)
Temperature Accuracy	±1°C
Heating Element	Fe-Cr-Al resistance wire
Working Voltage	AC 220V Single Phase 60/50 Hz (or according to your requirement)
Max. Power	2 KW
Net Weight	70 Kg

**Standard Sizes:**

- Dia40x300mm (1.5"x12")
- Dia40x450mm (1.5"x18")
- Dia60x300mm (2.5"x12")
- Dia60x450mm (2.5"x18")
- Dia80x300mm (3.0"x12")
- Dia80x450mm (3.0"x18")
- Dia100x450mm (4.0"x18").



Stainless Steel Tube Protecting Cover

TFV-14ST

**TFV-14ST, Vacuum Tube Furnace (Heated by SiC elements), 1400°C**

Model	TFV-14ST
Inside Chamber Size	dia60x300mm (diameter 2.5" x 12")
Standard Working Temp.	1300°C (continuous)
Maximum Working Temp.	1400°C (< 3 hrs)
Temperature Control	30 steps programmable and PID automatic control
Heating Rate	0~10°C/ min (suggestion: =< 10°C)
Temperature Accuracy	±1°C
Heating Element	SiC heating elements
Working Voltage	AC 220V Single Phase 60/50 Hz (or according to your requirement)
Max. Power	5 KW
Net Weight	90 Kg

**Note:** The furnace tube is High purity Al<sub>2</sub>O<sub>3</sub> ceramic with Outer diameter dia. 40mm, inner diameter is about 32mm  
The length of hot zone is 300mm  
Total length is 1000mm

**Standard Sizes:**

- Dia40x300mm (1.5"x12")
- Dia40x450mm (1.5"x18")
- Dia60x300mm (2.5"x12")
- Dia60x450mm (2.5"x18")
- Dia80x300mm (3.0"x12")
- Dia80x450mm (3.0"x18")
- Dia100x450mm (4.0"x18")



TFV-14ST tube furnace is a precision bench-top furnace using quality ceramic SiC rod as heating elements. It is widely used for materials or chemical lab to sinter all types of new materials samples under vacuum or other gases condition. It is controlled by high precision SCR (Silicon Controlled Rectifier) digital controller with accuracy ±1°C and 30 segments programmable up to 1400°C.



TFV-16MT

### TFV-16MT, Vacuum Tube Furnace (Heated by MoSi2 elements), 1600°C

TFV-16MT tube furnace is a precision bench-top furnace using quality ceramic MoSi2 rods as heating elements. It is widely used for materials or chemical lab to sinter all types of new materials samples under vacuum or other gases condition. It is controlled by high precision SCR ( Silicon Controlled Rectifier) digital controller with accuracy  $\pm 1^\circ\text{C}$  and 30 segments programmable up to 1600°C.

**Note:** The furnace tube is made from High purity Alumina ( $\text{Al}_2\text{O}_3$ ).  
The ceramic outer diameter is 60mm and the inner diameter is about 52mm  
The hot zone length is 300mm and the total length is 1000mm.



Model	TFV-16MT
<b>Standard Working Temp.</b>	1600°C (continuous)
<b>Maximum Working Temp.</b>	1650°C (< 3 hrs)
<b>Temperature Control</b>	30 steps programmable and PID automatic control
<b>Heating Rate</b>	0~10°C/ min (suggestion: $\leq 10^\circ\text{C}$ )
<b>Temperature Accuracy</b>	$\pm 1^\circ\text{C}$
<b>Heating Element</b>	MoSi2 heating elements
<b>Working Voltage</b>	AC 220V Single Phase 60/50 Hz (or according to your requirement)

Model	Outside DIM.	Weight	Inside Tube DIM.	Power	Uniformity
TFV-16MT-40-300	Dia40x300mm (1.5"x12")	140Kg	30mm	3kw	80mm
TFV-16MT-40-450	Dia40x450mm (1.5"x18")	210Kg	30mm	5kw	150mm
TFV-16MT-60-300	Dia60x300mm (2.5"x12")	160Kg	50mm	4kw	80mm
TFV-16MT-60-450	Dia60x450mm (2.5"x18")	230Kg	50mm	6kw	150mm
TFV-16MT-80-300	Dia80x300mm (3.0"x12")	170Kg	70mm	4kw	80mm
TFV-16MT-80-450	Dia80x450mm (3.0"x18")	250Kg	70mm	6kw	150mm
TFV-16MT-100-450	Dia100x450mm (4.0"x18")	210Kg	90mm	8kw	150mm



TFV-MZT

### TFV-MZT, Multi-Zones Tube Furnace

<b>Inside Chamber Size</b>	dia60x300mm (diameter 2.5" x 12")
<b>Standard Working Temp.</b>	1500°C (continuous)
<b>Temp. Range</b>	1000-1600°C (< 3 hrs)
<b>Temperature Control</b>	30 steps programmable and PID automatic control
<b>Heating Rate</b>	0~10°C/ min (suggestion: $\leq 10^\circ\text{C}$ )
<b>Temperature Accuracy</b>	$\pm 1^\circ\text{C}$
<b>Heating Element</b>	MoSi2 heating elements
<b>Vacuum Level</b>	0.1 Torr
<b>Working Voltage</b>	AC 220V Single Phase 60/50 Hz (or according to your requirement)
<b>Max. Power</b>	8 KW
<b>Net Weight</b>	230 Kg

**Note:** The furnace tube is made from High purity Alumina ( $\text{Al}_2\text{O}_3$ ).  
The ceramic outer diameter is 60mm and the inner diameter is about 52mm  
The hot zone length is 300mm and the total length is 1000mm  
One zone reach 1600°C, and another reach 1300°C.



#### Standard Sizes:

- Dia40x300mm (1.5"x12")
- Dia40x450mm (1.5"x18")
- Dia60x300mm (2.5"x12")
- Dia60x450mm (2.5"x18")
- Dia80x300mm (3.0"x12")
- Dia80x450mm (3.0"x18")
- Dia100x450mm (4.0"x18")

TFV-MZT tube furnace is controlled by two precision 30 segments digital temperature controllers independently. One zone is heated by MoSi2 elements up to 1600°C, and another zone is heated by SiC element up to 1300°C, So the tube furnace can create various thermal gradient by adjust two zone temperature. It is excellent furnace to prepare functional materials under thermal gradient, and also can be used for epitaxial film growth by CVD or PVD with a vacuum system.



BLF 17/3/3508P1

**BLF Series, 1700°C, 1800°C, Bottom Loading Furnaces**

Rapid heating and cooling are achievable by raising and lowering the hearth, whilst the operator is protected from direct exposure to radiant heat from the chamber.

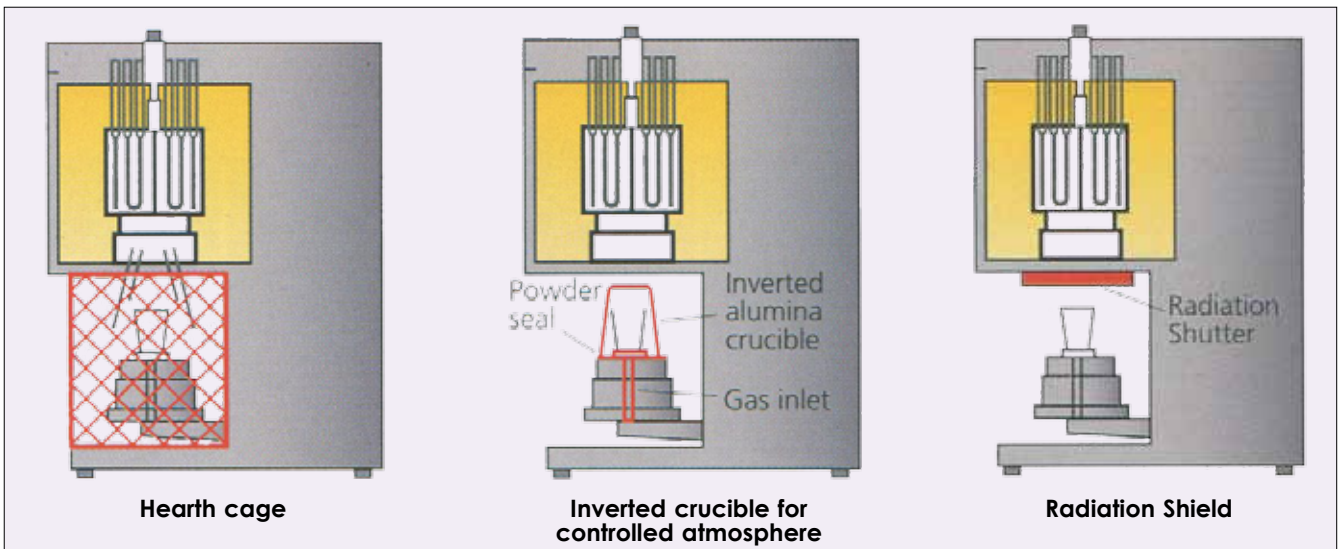
**Standard Features:**

- 1700°C or 1800°C maximum operating temperature.
- 3 to 21 Liter capacities
- Ideal for; sintering high performance ceramics, melting glass under high temperature, or working with modified atmospheres
- Extremely rapid heating & cooling cycles can be achieved through raising & lowering the hearth
- Electrically operated elevator hearth, protects operator from the chamber's radiant heat & gives easy loading of workpieces & crucibles
- Excellent temperature uniformity as a result of the round chamber
- Over temperature protection to protect load or furnace during unattended operation
- Programmable 3216P1 controller & separate over-temperature protection
- Molybdenum disilicide heating elements.

**Options:**

- Compatible crucibles
- Modified hearth for the introduction of gases
- Adaptation to introduce thermocouple or stirrer through the chamber top
- Rotating hearth option

- Radiation shutters
- Hearth cages
- RS232 & RS485 communications
- Fieldbus & Ethernet connectivity
- DAQ or graphical recorders.



Model	Max temp (°C)	Heat up time (mins)	Dimension		Vol. (Li-ters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm)					
BLF 17/3	1700	80	190x150	H975xW750xD530 Bench mounted	3	4125	B	155	Single
BLF 17/8	1700	80	250x200	H1950xW1360xD800 Floor standing	8	8130	B	424	3 phase
BLF 17/21	1700	180	300x300	H1850xW1250xD850 Floor standing	21	12000	2	600	3 phase
BLF 18/3	1800	110	190x150	H975xW750xD530 Bench mounted	3	4775	2	155	Single phase
BLF 18/8	1800	110	250x200	H1950xW1360xD800 Floor standing	8	7010	2	424	3 phase

Continuous operating temp. is 100°C below maximum temp.

# F FURNACES Top Hat, 1100°C, 1200°C



LTH 11/49

## LTH Series, 1100°C, 1200°C, Top Hat Chamber Furnaces

This furnace configuration enables very easy sample loading and rapid heating and cooling from lowering and raising the heated chamber on the hearth. It is also ideal for use with a modified atmosphere using an inverted crucible and optional gas inlet hearth.

### Standard Features:

- 1100°C or 1200°C maximum operating temperature.
- 3.5, 31, or 49 Liter chamber volumes.
- Rapid heating powerful free radiating wire elements & efficient low thermal mass insulation
- Rapid sample cooling can be achieved by raising the chamber
- Electrically elevated element chamber (the 3.5 Liter chamber raises or lowers in 5 seconds)
- Chamber rises to full internal height for easy loading
- All around heating chamber provides maximum heat transfer & uniformity
- During loading, elements switch off & are fully retracted
- Separate control module on 2 metre conduit for 3.5, 31 & 49 Liter models
- Hard wearing ceramic hearth
- Two handed elevator operation, with audible alarm and emergency stop button, for operator safety (except for LTH 12/3).



LTH 12/3

### Options:

- Over-temperature protection (always recommended for unattended operation or protection of valuable samples)
- Optional gas inlet
- Refractory metal bell jar to improve gas usage when working with modified atmosphere
- 8 or 20 segment programmer
- RS232 communications
- Optional leg extension stand for LTH/31 (illustrated).



LTH 11/31+Stand

Model	Max temp (°C)	Heat up time (mins)	Dimension		Volume (Liters)	Max power (W)	Thermocouple type	Weight (kg)	Power supply
			Inside (mm)	Outside (mm)					
LTH 12/3	1200	-	H200xDia.150	H655xW410xD540 H222xW570xD375	3.5	3000	R	38	single phase
LTH 11/31	1100	-	H500xW250xD250	H1900xW500xD600 H370xW225xD375	31	8000	N	-	3 phase
LTH 11/49	1100	-	H400xW350xD350	H2200xW640xD1057	49	9000	N	-	3 phase

Continuous operating temperature is 100°C below maximum temperature.



PTC 12/20

**PTC 12/20 Portable Thermocouple Calibration Furnace, 1200°C**

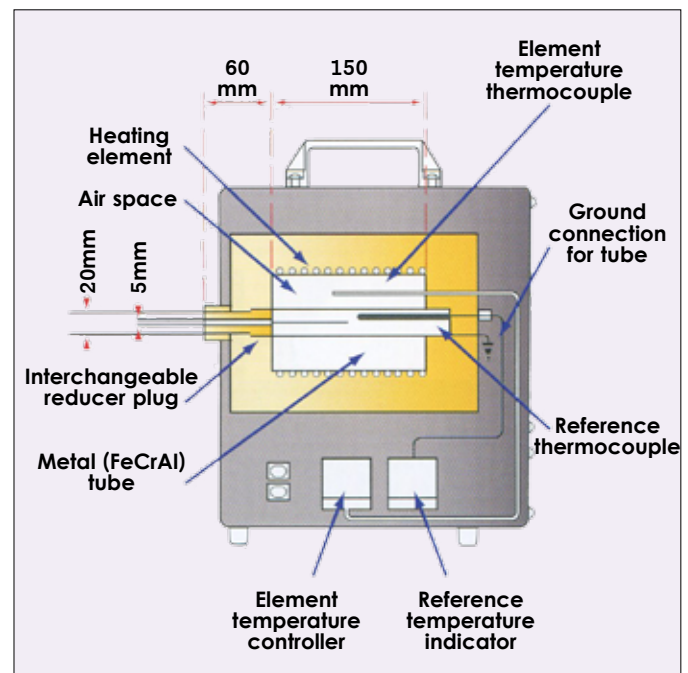
**Features:**

- 1200°C maximum operating temperature
- High stability heat source with temperature range 400 to 1200°C
- Accepts thermocouples up to 7.5mm diameter
- Thermocouple is inserted & compared to the PTC 12/20's displayed temp.
- Supplied with traceable calibration certificate stating the error between workspace temperature & displayed value at 700°C, 900°C & 1100°C
- PID temperature control & separate temperature display to 1.0°C resolution
- Portable & self contained

- The special work tube design provides a much higher temp. uniformity than is typical for a furnace of this size
- The metallic worktube is earthed for operator safety when testing metal sheathed mineral insulated mineral thermocouples
- Weighing in at only 8kg, the rapid heat up and stabilization of the PTC 12/20 make it ideal to set up and use in the lab or on site.

**Options:**

- A NAMAS traceable calibration certificate for customer defined setpoints is available.
- A NAMAS traceable thermocouple is available.



Model	PTC 12/20
Max. temp. (°C)	1200
Heat-up time (mins)	20 (to 1150°C)
Continuous temp. (°C)	1150
Temp. range (°C)	400 ~ 1200
Stability (°C)	±0.5 (1150°C)
Heated tube length(mm)	150
Cavity diameter (mm)	20
External H x W x D (mm)	399 x 310 x 225
Max. power (W)	1100
Thermocouple type	N
Weight (kg)	8.8
Power supply	single phase 120-240V

Continuous operating temperature is 50°C below maximum temperature.



**BacBasic**

<b>Exterior Dimensions (mm)</b>	W883xD712xH756
<b>Interior Dimensions (mm)</b>	W819xD482xH540
<b>Weight</b>	103kg
<b>Temperature Range</b>	Ambient to 42°C
<b>Temperature Uniformity</b>	+/- 0.5°C

**The MRC BacBASIC offers:**

- An ample, ergonomic, user-friendly work station with a minimal, space-saving exterior footprint.
- Excellent lighting and visibility.
- A quick-entry, gloveless sleeve system.
- A rapid\* Auto-Purge Pass Box for introducing up to 12 Petri plates, specimens & supplies. (\*Purge time less than 50 sec.)
- Incubated storage capacity for up to 150 Petri plates.
- Incubation temp. range from ambient temp. to 42°C.
- Easy-Change anatox & catalyst packs & the catalyst can be used for up to six months before replacement or reactivation.

**BacBasic, Environmental Work Station & Incubator For Anaerobic Applications, 215L**

The only thing "basic" about the MRC BacBASIC is its very reasonable price.

The BacBASIC is the ideal, entry level chamber for performance of truly anaerobic microbiology. Move beyond jars and the unnecessary exposure of your anaerobes to deadly oxygen.

Already have a chamber? Then the BacBASIC offers the perfect auxiliary chamber option for over-flow work, extra plate storage and emergency back-up for your primary chamber.



Ergonomic, "Gum Drop" \* Arm Port Doors offer maximum reach & comfort!

\*ARM PORT DOOR DESIGN PATENT PENDING



Removable viewing shield for introduction of equipment, cleaning, decontamination or maintenance.



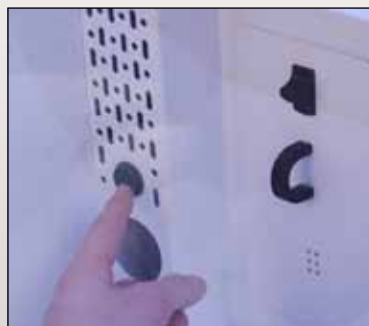
Simple Push Button Operation



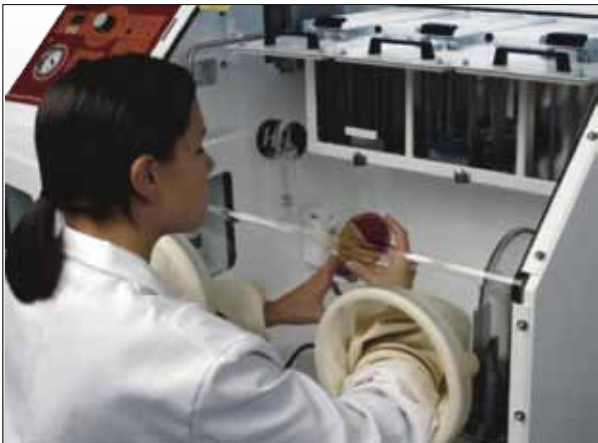
Central Pass Through Box



Easy Change Anatox & Catalyst Packs



Interior Auto-Purge Button



**Included with each system:**

- Vacuum pump with fittings and hoses .
  - One year warranty.
  - Two Catalyst Cartridges.
  - Petri plate racks.
  - Sleeve assembly with medium cuff.
- (Large and small cuffs are also available)

**BACTRON, Environmental Microbiology Work Station Anaerobic, Hypoxic, & other Gas Environments**

Patented BACTRON anaerobic/environmental systems allow efficient and dexterous glove-free handling and inspection of samples. Comfortable arm cuffs, which are available in three sizes, fit snugly around the users forearm. The convenient foot pedals are used to evacuate oxygen and add anaerobic gas to the sleeves while the airlock auto-cycle facilitates oxygen-free transfer of samples and supplies in the chamber.

Indicator Lights will signal that the air-lock is anaerobic and ready to be opened into the chamber. Simply open arm port doors and place on the convenient shelf or racks for out-of-the-way storage. Samples and supplies can then be brought into the chamber with ease from the sliding airlock shelf.

**Features/Benefits:**

- Gloveless design for dexterous, easy handling of samples.
- Separate incubator and work chamber for increased efficiency and user comfort.
- Condensate controller for virtually condensation-free work area and fog-free viewing.
- Catalyst cartridge increases anaerobic results and efficiency.
- System ready for out-of-the-box use, just add gas.
- Airlock can be operated manually or via unique auto-cycle.
- Microprocessor temperature controller with accurate & user-friendly keypad calibration.
- Independent over-temperature safety controller.
- Easy-to-use sliding airlock shelf preserves work space.
- Chamber pressure relief system featuring BACTRON manometer for comfort and maintenance of anaerobic environment.

**Vacuum pump, hoses and fittings are included**

**The air-lock feature offers ample pass-through capacity with a sliding shelf (shelf comes with II, III, IV only)**

**Durable, powder-coated, stainless steel body with rigid plexiglas front for clear viewing of samples.**

**Versatile, glove-free cuff system allows dexterous handling for users of any size**

**Optional powder-coated, stand with locking casters.**

**Internal incubator ranging from 100-900 plates depending on the model.**

**Large, ambient temperature workspace for user comfort and convenience.**

# G GLOVE-BOX Anaerobic Microbiology Work Station



**Quick Tip:**

Many BACTRON users have learned to save time, and conserve gas by bringing small items into the chamber using the gloveless sleeve system.



**Airlock Tray:**

The Interior Airlock of the BAC II, III, & IV is equipped with a sliding tray to easily bring items into the anaerobic workspace.

**Applications:**

- Anaerobic Microbiology Assays • Clinical Microbiology • Anaerobic Tissue Culture Research • Anaerobic Bacteriology • Hypoxic Tissue Culture Research • Microaerophilic/Hypoxic • Quality Control • Packaging • R&D • Industrial Research.

**The Bactron Product Offering:**



**BACTRON-I-II**

The BACTRON I & II are very similar units differing in size but not in performance. The BACTRON-I is the smallest of the fleet with a 100 plate capacity. Our most popular seller, the BACTRON-II, provides larger workspace & plate capacity.

**BACTRON Value:**

The BACTRON Anaerobic Chamber systems are just that: a system.

All components for trouble-free use are included with your initial purchase, including a vacuum pump, sleeves, cuffs and all the necessary tubing.

**BACTRON Versatility:**

The MRC BACTRON Anaerobic & Environmental Chamber line offers multiple high-value features and essential benefits. Incubator Petri plate capacities and chamber dimensions accommodate varied laboratory needs and budgets. Ranging from 100 to 900 Petri plate incubator capacities, the BACTRON Chamber Line can address a myriad of anaerobic, hypoxic or other special gas environment applications.

**BACTRON Innovation:**

The dedicated incubators mean that all Bactron Chambers have an ambient-temperature workspace. This allows users to stay inside the chamber for extended periods of time without becoming uncomfortable.

Our innovative humidity control system provides a condensation free environment that allows for clear, easy inspection of cultures. The Bactron Chamber is constructed of highly resilient materials. The sturdy PLEXIGLAS hood and durable stainless steel body ensure years of long, trouble-free use. The BACTRON line of anaerobic chambers feature a unique pressure-management system inside the chamber for comfortable use and strict anaerobic conditions. A manometer is located inside the chamber to provide a visual reference and to relieve pressure during use for comfort and convenience.

**Over-temperature Safety**

**Incubator Temp. Control**

**Vacuum Gauge**

**Airlock Cycle Switch  
Operation Indicator Lights**







### BACTRON-III

The BACTRON-III uses a rear wall incubator with sliding doors to increase plate capacity to 300. This compact design provides the largest incubation room with the smallest foot print.



### BACTRON-IV

The BACTRON-IV offers 600 plate capacity by using a space saving rotating shelf design. Two rear mounted shelves help keep your workspace organized.



### BACTRON-IV900

The BACTRON-IV900 has the same specifications as the standard BACTRON-IV with the addition of a rear wall incubator. With capacity of 900 plates this unit will suffice for even the busiest lab.

Model *2 denotes 230V	BACTRON-I BACTRON-I-2	BACTRON-II BACTRON-II-2	BACTRON-III BACTRON-III-2	BACTRON-IV BACTRON-IV-2	BACTRON-IV900 BACTRON-IV900-2
<b>Exterior DIM. WxDxH</b>	124x82x69.9cm	155.7x82x69.9cm	124x82x85.1cm	223x82x69.9cm	155.7x82x69.9cm
<b>Exterior Volume</b>	710.3L	892.3L	865.3L	1278L	892.3L
<b>Interior DIM. WxDxH</b>	83.8x72.4x63.5cm	107.4x72.4x63.5cm	83.8x72.4x63.5cm	107.4x72.4x63.5cm	107.4x72.4x63.5cm
<b>Interior Volume</b>	346.4L	444L	346.4L	444L	444L
<b>Air Lock (Access)</b>	22.9x27.9x22.9cm	30.5x35.6x30.5cm	22.9x27.9x22.9cm	30.5x35.6x30.5cm	30.5x35.6x30.5cm
<b>Air Lock Volume</b>	17.3L	37.8L	17.3L	37.8L	37.8L
<b>Incubator WxHxD</b>	68.1x23.5x21.1cm	91.4x23.5x21.1cm	69.9x34.5x21.6cm	58.4dia x- x 47cm	107x72.4x64.1cm
<b>Incubator Volume</b>	33.7L	45.3L	52.1L	126L	153L
<b>Electrical</b>					
<b>Volts/Hertz</b>	120-230/50-60	120-230/50-60	120-230/50-60	120-230/50-60	120-230/50-60
<b>Watts</b>	1100	1100	1100	1350	1100
<b>Phase/amps</b>	Single/9.17	Single/9.17	Single/9.17	Single/11.25	Single/9.17
<b>Interior Outlets</b>	2**1amp. Max.	2**1amp. Max.	2**1amp. Max.	2**1amp. Max.	2**1amp. Max.
<b>Exterior Outlet, Vacuum</b>	5amp. Max	5amp. Max	5amp. Max	5amp. Max	5amp. Max
<b>Circuit Breakers main/Vacuum</b>	2	2	2	2	2
<b>cUL, CE approved</b>	UL, CSA, EU, CE				
<b>Incubator Performance</b>					
<b>Temp. Range</b>	Amb +5° to 70°C	Amb +5° to 70°C	Amb +5° to 70°C	Amb +5° to 70°C	Amb +5° to 70°C
<b>Temp. uniformity @37°C</b>	±0.5°C	±0.5°C	±0.5°C	±0.5°C	±0.1°C
<b>Weight</b>					
<b>Shipping Weight (kg)</b>	218	277	218	345	277
<b>With Optional Stand (kg)</b>	323	346	323	596	346
<b>Miscellaneous</b>					
<b>Petri plate racks included</b>	6	8	7	10	10
<b>Optional Stand DIM.</b>	124.5x76.2x78.7cm	156x76.2x78.7cm	124.5x76.2x78.7cm	225x76.2x78.7cm	156x76x78.7cm
<b>Plate Capacities</b>	100	200	300	600(900with upgrade)	900

\* The height DIM. of the interior is a subjective working height. This measurement reflects the dimension from the floor of the chamber to the top of the body without regard for shelves, interfering incubators or the airlock door.

\*\*220 volt units are supplied with one interior outlet. Specifications subject to change without notice.

# G GLOVE-BOX Anaerobic/Hypoxia Microbiology Work Station



## Bactrox, Hypoxia Chamber

This latest addition to the MRC Bacatron line offers precise oxygen control ranging from 1% to 20% for microaerophilic bacteriology and hypoxic tissue or cell culture applications. It has the additional capability of controlling carbon dioxide from 1% to 20%. The MRC Bactrox permits oxygen and carbon dioxide control in increments of 0.001%. Unlike a tri-gas incubator, the Bactrox allows for microaerophilic bacteriology and hypoxic tissue or cell culture work to be performed in desired oxygen conditions throughout all culturing processes. The Bactrox is a complete workstation so bacteria and cells are more likely to grow faster and show less damage.

### Advanced Atmospheric PID Controller:

Highly Accurate Zirconium Dioxide Oxygen Sensor, CO<sub>2</sub> Control & Logging, O<sub>2</sub> Control & Logging, Uses Ambient Air Pump Instead of O<sub>2</sub> Tank, Uses Standard Nitrogen & CO<sub>2</sub> Tanks Independent Incubator (5°C above ambient to 70°C): Temperature Control & Logging, 300 Plate Capacity, Incubate Your Experiment, Not Yourself. Ultra-Fast Extra Large Passbox: Vacuum-less Pass Box, Complete Cycle Time of 60 Seconds, 90 Plate Capacity Vacuum-less Sleeve Entry: Immediate Entry Into Chamber, Foot Pedal Vacuum System Eliminated.

### Features:

- Ultra Bright LED Examination Lights
- Stainless Steel Construction for Long Term Durability
- Independent Gas Controls
- RS232 Data Collection
- Condensation Control - High Humidity With Little or No Condensate
- Immediate Access to Chamber Via Sleeves
- Standard Microscope Adapter Accessories
- PC Calibration of Oxygen Sensor
- 24 Month Limited Warranty.



## Bactron X, MRC Anaerobic Chamber

The Bactron X is designed to provide 17 cu.ft. of workspace and gloveless dexterity in closed environment industrial, research and development, quality control and packaging applications. Atmospheres of nitrogen, CO<sub>2</sub>, or any other inert gas are possible.

Bactron systems have airtight construction of stainless steel and rigid Plexiglas for unobstructed vision and integrity. The patented cuffs form a comfortable seal around the operator's arms permitting bare hand manipulation of plates and specimens inside the working chamber, making work more comfortable and efficient.

Chamber atmosphere circulates through a condensate controller then through a catalyst, which removes any trace amounts of oxygen. High relative humidity is maintained while condensate moisture is removed without the unnecessary desiccants, which can dehydrate media and samples. Each unit contains an integral vacuum pump to provide rapid evacuation of air from the air lock module for replacement by an inert gas mixture.

Unlike many anaerobic chamber manufacturers, the MRC Bacatron chambers have full third party verified safety compliance certificates. We meet EN61010, UL61010 and Can/CSA61010 standards.

Installation is included with purchase. In addition, every purchase of a Bacatron system in the USA includes an operator training workshop in anaerobic bacteriology and use of the system.

### Features:

- Ergonomic Arm Port Doors - based on our patented teardrop shaped BacBasic armport doors, this new design lets you reach all areas in the chamber with comfort and ease
- Control Panel Layout - functions are logically grouped together to make chamber operations more user-friendly
- Catalyst Design - new ergonomic handle makes changing out your catalyst easier than ever
- Component Upgrades - new digital vacuum gauge and more reliable pressure sensor make viewing and changing setpoints a breeze
- Anatox Fan Accessory - removes volatile fatty acids and sulfur compounds to extend the life of your palladium catalyst as well as toxic and corrosive compounds that can shorten the life of electronic components (see part number 9490578)V.

Model	Bactron-X	Bactrox
<b>Weight</b>	246kg	N/A
<b>Airlock Interior DIM. WxDxH (cm)</b>	30.8x42x30.8	23x27.5x22
<b>Working Chamber Interior DIM. WxDxH (cm)</b>	106.7x73x62.9	87x73.7x64.1
<b>Incubator Interior DIM. WxDxH (cm)</b>	N/A	70x20x34
<b>Exterior DIM. WxDxH (cm)</b>	158.8x82.6x74.9	124x79.5x82.5
<b>Airlock Volume (L)</b>	39.6	17.3
<b>Working Chamber Volume (L)</b>	490	346.4
<b>Incubator Volume (L)</b>	N/A	52.1
<b>Plate Capacity (L)</b>	N/A	300



**Application:**

Acrylic glove box is widely used for preparing nano-materials and battery electrode materials.

**GBOX-1/1-P, Acrylic Glove Box**

**Features:**

- Bench-top transparent glove box offers larger inert gas environmental workspace with vacuum air locker and side door.
- The Glove box is made of transparent polycarbonate for clear viewing from any angle.
- Polycarbonate construction affords resistance to a wide range of chemicals, high-impact strength and scratch-resistance and the smooth, hemispherical interior cleans easily.

Model	GBOX-1	GBOX-1-P
Material	Plastic	
Plastic Type	PVC	
Air Locker Chamber Size	230L x 230W x 230H mm	
Containment Chamber Size	875L x 480W x 500H mm	
Product Overall Size	1150L x 500W x 500H mm	
Net Weight	21kg	25kg
Pressure Controller	No	Yes



**GBOX-2/3/4, Stainless-Steel Glove Box**

**Features:**

- Stainless Steel Vacuum Glove Box with Airlock chamber and gauges, transparent front panel make operation easy.
- Vacuum Pressure: in airlock chamber: up to 0.05 Torr (0.067 mbar); In all glove box: up to 0.5 Torr (0.67 mbar) (Note: The glove box is not designed for ultra-high vacuum. Stainless steel case may deform at higher vacuum).
- Positive Pressure: Max: 1.1 atm (note: gloves can not work if pressure is higher that 1.1 atm 810 torrs).
- Inert gases pressure maintain: > 12 hours. Main chamber leakage rate: < 3 torr/hour.

**Application:**

Heavy duty stainless steel structure glove box: a clean, air-tight, controlled environment for a wide range of researching processes in material science, chemistry and semiconductor and related industries.

Model	GBOX-2	GBOX-3	GBOX-4
Material	Stainless steel		
Air Lock Size	200 dia. x 260 length mm	240 dia. x 260 length mm	410 dia. x 610 length mm
Main Chamber Size	550W x 440D x 410H mm	780W x 650D x 700H mm	1160W x 665D x 900H mm
Front Window Size	500W x 165H mm	710W x 320H mm	1050W x 600H mm
Gross Weight	96kg	236kg	400kg



HT1-1 & HT1-2

### Heating Tapes Width 1" up to 450°C

- Extremely flexible.
- Exceptional durability.
- Rapid temp. response.
- Max. Exposure temp. 450°C
- Choice of power plugs
- Temp. or voltage controller required.
- Electrical cable length 80cm.
- Perfect for heating of curved parts of irregular shapes such as valve, pump, vacuum line, pipe, flange, elbow, etc.
- It must be used with a separate temperature voltage controller.
- Insulation type fiber glass.
- Technical Data:
  - Heating Element: Ni-chrome wire.
  - Heating Element Temperature: Up to 450°C
  - Power Supply: AC220 ~230V, 50/60Hz
- Products are not waterproof.



HT11-2.5

Model	Width (") x Length (m)	Wattage
HT 1-1	1"x1m	200 W
HT 1-1.5	1"x1.5m	250 W
HT 1-2	1"x2m	300 W
HT 1-2.5	1"x2.5m	350 W
HT 1-3	1"x3m	400 W
HT 1-4	1"x4m	460 W



### Silicon Heaters

300Watt/18x17cm

45Watt/6x9cm

250Watt/8x20cm

130Watt/5x23cm

500Watt/10x37.5cm

### For control of heating tapes, max. watt – 2000 watt. Power regulator: 0-100%

- Solid state electronics make this variac the perfect instrument for research and especially teaching labs.
- Safety features include sparkless solid state regulation of voltage output to oil baths, heat lamps, heating mantles, or virtually any heater.

### Power Wattage Controller



MS-C

### Temperature Controller



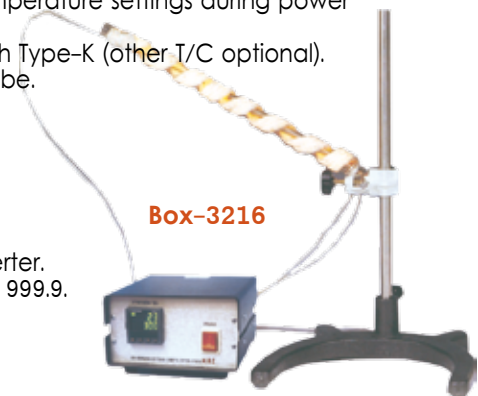
Box-3216

Back

### Box-3216, Precise Digital Temperature Controller

For Control Of Heating Tapes, Heating Mantles, Hotplates, Ovens, Water Baths, Immersion Heaters, incubators etc.

- Wide range of temperature controls to match most heating applications: mantles, hotplates, heating tapes, small ovens & other resistive heating loads up to 3500 Watt.
- Quick connections for load and temperature sensor.
- Digital dual display for set point and process temperature indication.
- Easy to operate.
- Non-volatile memory retains temperature settings during power interruptions.
- Models are available for use with Type-K (other T/C optional).
- Supplied with Thermocouple Probe.
- Fuzzy modified PID control.
- Auto tune function.
- Soft start ramp and dwell timer.
- Bright dual color display.
- Fast sampling rate 5meas/sec.
- Power 110-250VAC 50/60Hz.
- High accuracy 18 Bit A/D converter.
- Max. temp. 1370°C dec point to 999.9.
- Size: W185xD190xH115mm.
- Weight: 1.4kg.



Box-3216

### Available power sockets



ISR

USA

EURO

UK

CHIN

Model	Function	Thermocouple	Temp. range	Power output
Box-3216	Control with ramp to set point & 100 hrs timer	K	-50~1200°C	3500 watt 230V/50Hz
		T	-20~400°C	
Box-2416P4	Programmer with 4 programs of 8 segment	K	-50~1200°C	3500 watt 230V/50Hz
		T	-20~400°C	

**MN-C/MN-D Series, Metal Case Mantles, Analog/Digital Control**



Model Manual Control	Model Digital Control	Capacity	Power
MN-50C	MN-50D	50ml	60W
MN-100C	MN-100D	100ml	80W
MN-250C	MN-250D	250ml	200W
MN-500C	MN-500D	500ml	300W
MN-1000C	MN-1000D	1000ml	400W
MN-2000C	MN-2000D	2000ml	500W
MN-3000C	MN-3000D	3000ml	600W
MN-5000C	MN-5000D	5000ml	700W
MN-10LC	MN-10LD	10L	1300W
MN-12LC	MN-12LD	12L	1300W

**Features:**

Aluminum housing is chemical resistant, tough, lightweight and easy to clean • Built-in controller regulated element temperature to 450°C • 10 Series mantles sizes available from 50 to 12Liter • Unique air flow through ventilation slots beneath & around the rim & case keeps the exterior safe to touch • Flexible coiled heating element provides good heat transfer while absorbing shock minimizing risk of flask breakage • Heating element and insulation form an easily replaceable heating cartridge • A "Heater On" light indicates when power is being supplied to the heaters • Aluminium housed case, rigid housing to support the weight of the vessel • Provide uniform heating of vessel without the danger of open frame • Covering only the bottom half of the vessels & provide full view of the contents of the vessel • Fabric mantles for effective heating & protection of glass vessels from thermal shock • MN-C Series manual control-proportional voltage control from 0-100% • MN-D Series with external probe for precise control of the sample.



# H HEATING MANTLES Digital & Analog, With Magnetic Stirrer

## MNS Series, Heat And Stir Cool Case Heating Mantles



Model	Model for beakers	Capacity	Speed range	Power
MNS-250	BMNS-250	250ml	0-1200rpm	200W
MNS-500	BMNS-500	500ml	0-1200rpm	300W
MNS-1000	BMNS-1000	1000ml	0-1200rpm	400W
MNS-2000	BMNS-2000	2000ml	0-1200rpm	500W
MNS-5000	BMNS-5000	5000ml	0-1200rpm	700W

### Features:

- Built-in electronic controller
- Designed for stirring and heating of liquid
- Heating cartridge can be quickly & easily replaced in the event of failure
- Stirring is Independently controlled with a variable speed control up to 1200rpm
- Built-in temp. control maintains element temp. from ambient to 450°C
- Combines the traditional Electrothermal heating element with easily controlled solid state stirring
- Vented case creates a unique air flow which allows housing to be safe to the touch when in use.

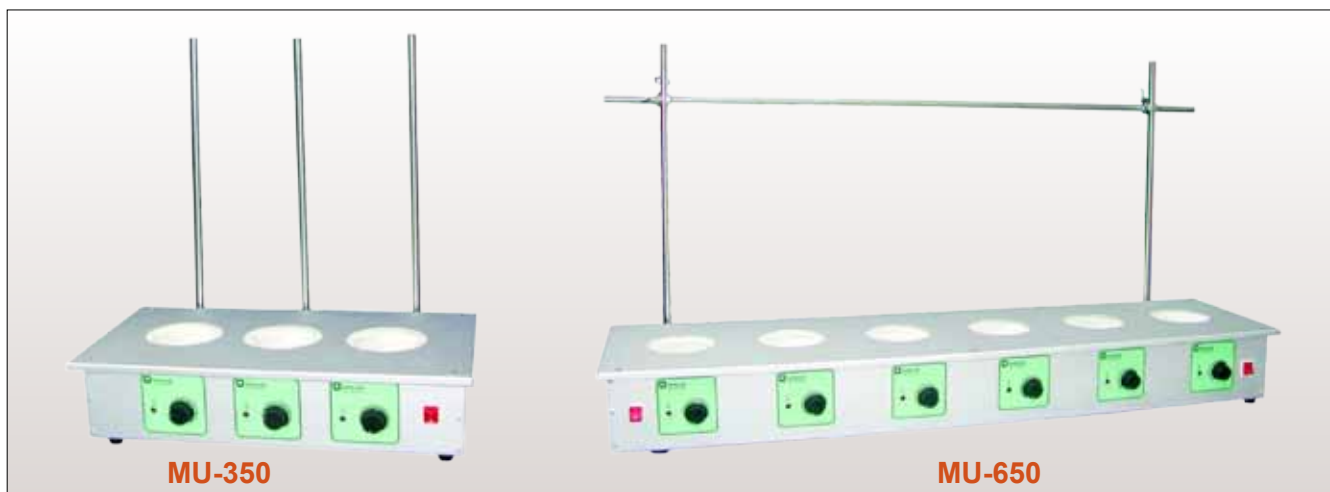
## BMN-C Series, Heating Mantles For Beakers



Model Manual Control	Model Digital Control	Capacity	Power
BMN-50C	BMN-50D	50ml	60W
BMN-100C	BMN-100D	100ml	80W
BMN-250C	BMN-250D	250ml	200W
BMN-500C	BMN-500D	500ml	300W
BMN-1000C	BMN-1000D	1000ml	400W
BMN-2000C	BMN-2000D	2000ml	500W
BMN-3000C	BMN-3000D	3000ml	600W
BMN-5000C	BMN-5000D	5000ml	700W
BMN-10LC	BMN-10LD	10L	1300W
BMN-12LC	BMN-12LD	12L	1300W
BMN-20LC	BMN-20LD	20L	2400W
BMN-22LC	BMN-22LD	22L	2400W
BMN-50LC	BMN-50LD	50L	3200W

### Features:

- Maximum 450°C operating temperature
- Aluminium housed case, rigid housing to support the weight of the beaker
- Provide uniform heating of beaker without the danger of open frame
- For beaker capacity: 250ml, 500ml, 1 Liter, 2 Liter, 3 Liter, 5 Liter
- Fabric mantles for effective heating & protection of glass beaker from thermal shock
- Manual control- proportional voltage control from 0-100%.



**Multi-position Heaters**

Choice of three or six recesses • Build-in electronic controller • Choice of heater only or heater/stirrer combination • Vented case ensures case remains “cool to the touch”.

**Product Description:**

- Individual built-in solid state electronic controls enable easy regulation of each heater, while removing sparking associated with mechanical switching.
- Units include three 0.5" (12.7mm) diameter support rods.
- The robust construction permits continuous operation of the units as required by routine extraction tests.
- MUS models incorporate a stirring module that allows the solution to be stirred and heated at the same time.
- MUS stirrer models include stirring control for each heater.
- Element temperature range to 450°C.
- Stirrer models include a stirring speed range of 50-1000 rpm.
- The coiled heating element is suspended within a thermal insulating cartridge to provide maximum heat transfer and support while removing sparking associated with mechanical switching.
- Heater cartridge can readily be replaced when necessary.
- For additional operator protection a safety earth (ground) screen encloses the heaters.
- Unique air flow ensures unit is safe to the touch.
- Pilot lights indicate when power is on, supplied to heaters and supplied to stirrers.

Models	Capacity	Units	Total watts	Dimension (mm)		
				H	W	L
<b>MU-325</b>	250 ml	3	600W	135	300	660
<b>MU-350</b>	500 ml	3	900W	135	300	660
<b>MU-3100</b>	1000 ml	3	1200W	170	300	750
<b>MU-625</b>	250 ml	6	1200W	135	300	1200
<b>MU-650</b>	500 ml	6	1800W	110	300	1200
<b>MU-6100</b>	1000 ml	6	2400W	170	300	1500

Models with stirrers	Capacity	Units	Speed Range	Total watts	Dimension (mm)		
					H	W	L
<b>MUS-325</b>	250 ml	3	0~1200 rpm	600W	210	300	660
<b>MUS-350</b>	500 ml	3	0~1200 rpm	900W	210	300	660
<b>MUS-3100</b>	1000 ml	3	0~1200 rpm	1200W	245	300	750
<b>MUS-625</b>	250 ml	6	0~1200 rpm	1200W	210	300	1200
<b>MUS-650</b>	500 ml	6	0~1200 rpm	1800W	210	300	1200
<b>MUS-6100</b>	1000 ml	6	0~1200 rpm	2400W	245	300	1500

## Specialty Heating Mantles



K-2

K-1



Heating Mantle with Magnetic Stirrer

KM-2

KM-1

Built-in electronic controller regulates heating element from ambient to 750°C, 2 ranges: low & high

- Durable housing is chemically resistant
- Accept a large range of flasks
- For maximum operator protection, models are grounded should spillage or flask breakage occur
- Units are designed with a built-in stainless steel liner that gives electrical & mechanical protection against spillage & enables easy cleaning
- All models include support rod holder.

### Three Flask Size In One Mantle

#### Model K-1

- For flasks up to 1000ml.
- Stepless heat control.
- Operating temp. up to 750°C.

Model K-2 for flasks up to 2000ml.



KM-1D

Optional: Digital Temp. control

#### Features:

- Three in one design accommodates 250, 500 or 1000ml round bottom flasks (K-1, KM-1).
- Three in one design accommodates 500, 1000 or 2000ml round bottom flasks (K-2, KM-2).
- Different vessel sizes, spill proof heater.
- Includes rear bracket for support rod.
- Stepless heat control up to 750°C (650°C with stirrer)
- Variable speed control up to 1800rpm (KM-1, KM-2).
- Heater on light.
- Element temperature range of ambient to 750°C.

### Heating Mantle With Magnetic Stirrers

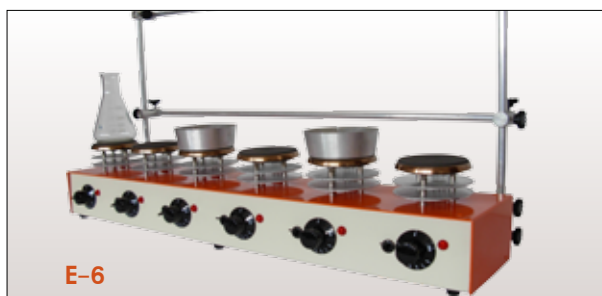
#### Model KM-1/KM-2

- Stepless heat control up to 650°C
- Variable speed control up to 1800 RPM

### Specifications:

Analog Model	Digital Model	Temp. range	Capacity	Stirring	Dimensions	Weight	Watt
K-1	K-1D	up to 750°C	250-1000ml	-	W12xD17xD18cm	1.2kg	550
K-2	K-2D	up to 750°C	500-2000ml	-	W21xD20xD24cm	1.4kg	750
KM-1	KM-1D	up to 650°C	250-1000ml	up to 1600rpm	W16xD17xD23cm	2.3kg	550
KM-2	KM-2D	up to 650°C	500-2000ml	up to 1600rpm	W21xD20xD24cm	2.5kg	750

## E-Series, Multi Position Round Top Extraction Heater



E-6

### Application:

- Allows you to run different projects concurrently or to make simultaneous multiple runs of the same project.
- Ideal for extraction, distillation, and digestion.
- Optional: Aluminium top mould for round bottom flasks up to 250ml/500ml for extraction apparatus soxhlet.

The Multi Heating Apparatus offers such versatility that is suitable for many laboratory purposes: extractions, distillations, digestions, evaporation etc. The 6 separate heat controls allow the heaters to be used for several different projects or multiple runs of the same project. The Multi Heating Apparatus in conjunction with interchangeable top mould for round bottom flasks - solves the most varied heating problems.

**Model E-6** Six individual heat controls with pilot lights • Built-in temperature regulator • For 6 places, 220 Volt (on request 115 V), 2700 Watts (6x450 W) • Approximate temp.: 40 - 450°C • Hotplate top 85 mm. dia. • Dimensions (WxHxD): 80x17x20 cm • Accessories: Optional: 6 interchangeable aluminum top moulds for round bottom flasks up to 100 ml or 250 to 500ml (Kjeldahl flasks 500-800 ml) • 4 support rods 800x12 mm. with 4 clamps.

**Model E-4** as described above, but for 4 places 220Volts 1800Watts (4x450W). DIM. (WxHxD): 60x17x20 cm.





**Model K-6, 6 Positions**

Up to 6 flasks • 220 Volt (or 110V), 6x550 Watt • Dimensions: (WxHxD) 80x19x20 cm (D includes rear bracket for support rod) • Nett weight: 6.8 Kgs.

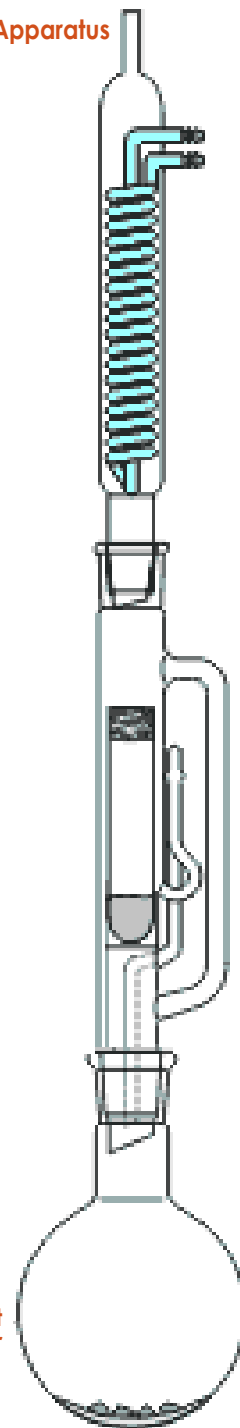


**Model: K-4, 4 Positions**

Up to 4 flasks • 220 Volt (or 110 V), 4 x 550 Watt • Dimensions: (WxHxD) 60x19x20cm (D includes rear bracket for support rod) • Net weight: 4.8 Kgs.

**K-Series, Multi Unit Macro Kjeldahl Apparatus**

- For flasks 250 up to 1000 ml.
- Spillproof–Stainless Steel Heater.
- Stepless– heat control.
- Operating temp.: up to 750°C.
- Includes 4 support rods and 4 clamps.
- Durable housing is chemically resistant.
- Built-in electronic controller regulates element temp. to 750°C, 2 ranges: low & high.
- Robust aluminium construction permits operation of the units as required by extraction and distillation processes.
- "Heat on" light for each recess indicates when power is being supplied to the heater.
- For maximum operator protection, models are grounded should spillage or flask breakage occur.
- Units are designed with a built-in stainless steel liner that gives electrical and mechanical protection against spillage & enables easy cleaning.
- Lower profile for space-saving convenience.
- Ideal for repetitive extracting (kjeldahl, soxhlet, and other extraction procedure), refluxing & distilling laboratory applications.
- Analog controller built-in system.
- Rods & clamps are offered as standard.
- Ideal for all brands round flasks.
- Highly-processed aluminium case offers robust standing, easy handling.



Soxhlet Extractor

**Soxhlet Extractors**

For the extraction from solids with solvents. The solvent is recirculated continuously and distilled from the extracted sample before contacting the solid again. The extract is concentrated in the distillation flask.

The method allows an effective separation with relatively small amounts of extracting solvents.

The complete apparatus consists of

- round bottom flask
- compact and robust designed extractor with NS 29/32 flask connection.



Cat.No.	Extractor ml	Condenser NS	Flask ml	Condenser
5.3600.25	30	29/32	100	dimroth
5.3600.31	70	34/35	100	dimroth
5.3600.37	100	45/40	250	dimroth
5.3600.43	150	45/40	250	dimroth
5.3600.46	200	45/40	250	dimroth
5.3600.49	250	45/40	500	dimroth
5.3600.52	300	60/46	500	dimroth
5.3600.58	500	60/46	1000	dimroth
5.3600.70	1000	71/51	2000	dimroth

# HOMOGENIZERS Hand Held, BenchTop, 160Watt, 0.1–250ml

The Homogenizer is widely used in fields of Biotechnology, Human & veterinary medicine/clinical medicine, Pharmaceutical industry, Cosmetics industry, Food industry, Petrochemistry, Paint & lacquer industry etc. The material is repeatedly cycled through narrow slits in the stator where it is rapidly sheared and disintegrated by high shear mechanical action. Complete homogenization of tissues (muscle, liver, breast tissue, etc.) is usually achieved in a few seconds. Little, if any, heat is produced during the process.



HOG-160-1/2

### Features:

- Easy to hold & light weight for one hand operation.
- Sample Volume Range: 0.1–50 ml or 1–250ml
- Autoclavable stainless steel shafts. Inert to aggressive solutions.
- All shafts are interchangeable shafts and are easily removed for cleanup.
- High speed motor. Speed control from 8,000 to 30,000rpm.

### HOG-160-1/2, Handheld Homogenizer

Use for mixing, emulsification, shredding, or chopping.

Practical answer for small samples.

D-160 is a rotor/stator type hand held tissue homogenizer which can rapidly homogenize, disperse and emulsify samples in 0.1–250ml. During operation, the suspended material is drawn into the core of the homogenizer by a rotor turning at up to 30,000 rpm.



Model	HOG-160-1/2
<b>Power Supply</b>	110-120V/60Hz , 220-240V / 50-60 Hz
<b>Motor Type</b>	Universal motor, 160 Watt
<b>Speed range (rpm)</b>	8,000 – 30,000
<b>Max. Circum. Speed</b>	6.3-14m/sec
<b>Speed control type</b>	Dial knob 6 stage
<b>Working Volume (ml, H<sub>2</sub>O)</b>	0.1-50ml(Dispersing shaft DS-160/5) 1-250ml(Dispersing shaft DS-160/10)
<b>Max. Viscosity</b>	5000mPas
<b>Material of Dispersing Shaft</b>	SS 316L stainless steel / PTFE
<b>Dimension LxWxH (mm)</b>	46 x 55 x 230
<b>Weight (kg)</b>	0.6
<b>Noise</b>	72 dB(A)
<b>Operating Environment</b>	0-40°C, 85% rel. humidity
<b>Protection class</b>	IP20

### Homogenizers of HOG-160-1/2

Model	Package Include	Power supply
<b>HOG-160-1 (Package 1)</b>	HOG-160 drive, H 370 Stand, DS-160/5 shaft, Dispersing shaft 5mm, for solid/liquid media volumes from 0.1-50ml	110-120V, 50/60Hz
		220-240V, 50/60Hz
<b>HOG-160-2 (Package 2)</b>	HOG-160 drive, H370 Stand, DS-160/10 shaft Dispersing shaft 10mm, for solid/liquid media volumes from 1- 250ml	110-120V, 50/60Hz
		220-240V, 50/60Hz

Model	Description of Dispersing Shaft	Applications / Industry Examples	Treatable Volume (ml)	Max. Circum. Speed (m/sec)	Dia. of the Rotor (mm)	Min/Max Emersion Depth (mm)	Ultimate Fineness (µm)	
							Suspension	Emulsion
<b>DS-160/5</b>	5mm for Solid/ liquid media	Biotechnology, Pharmaceutical industry 0.1ml – 50ml	0.1-50	6.3	5	7/50	10-50	1-10
<b>DS-160/10</b>	10mm for Solid/ liquid media	Biotechnology, Pharmaceutical industry 1ml – 250ml	1-250	14	10	10/120	10-50	1-10

\* All kind of sterilization possible



**HOG-020D**

**HOG-020, HOG-020D, HOG-022, BenchTop Homogenizers**

**Applications:**

- Widely used in dispersing various materials.
- Also applied to biology & medical research for skin tissue, cells and so on.
- Fiber, paper, cloth, cosmetic, dye & ink can be applied.
- Water and oil mixing and emulsifying.

**Features:**

- Digital speed meter display (HOG-022).
  - Spring elevator for easy positioning the pole (HOG-022).
  - With an overheat protection and fuse safety device (HOG-022).
  - Various containers can be used.
  - Operating capacity: 0.3m1–3L with the same driver but different homogenizer head choices.
- \*Any homogenizer head need be purchased separately.  
(Photo shown here is for reference only).



**HOG-020**

- The impeller can be separated completely and cleaned easily.



**HOG-022**

Model	HOG-020	HOG-020D	HOG-022
<b>Digital</b>	NO	YES	YES
<b>Motor</b>	DC 250W		
<b>Speed (rpm)</b>	26,000		20,000
<b>Size (mm)</b>	W200xD315xH500		W310xD270xH690
<b>Weight (kg)</b>	7		10
<b>Power</b>	AC110/220V, 50/60Hz		

	Model	Capacity (H <sub>2</sub> O)	Dimension	Application
	<b>GEN-0010</b>	0.3~10 ml	Ø7x130 mm	To homogenized and mix cell tissue in small amount
	<b>GEN-0250</b>	2~250 ml	Ø12x170 mm	To disperse plant and animal tissue, To dispose suspensions and emulsions for homogenizing, mixing & extraction
	<b>GEN-2000</b>	2~2000 ml	Ø20x200 mm	To disperse plant and animal tissue, To dispose suspensions and emulsions for homogenizing, mixing & extraction
	<b>GEN-3000</b>	100~3000 ml	Ø30x250 mm	To disperse organic and inorganic matters for homogenizing, mixing and extraction

# HOMOGENIZERS BenchTop, 500Watt, 10ml-8Liter

## HOG-500, Homogenizer

Philosophy made simple, so easy to handle. Ability to achieve quality results fast. It has the speed and power to emulsify, suspend, cut-up and disrupt to yield accurate results every time. Full flexibility as hand-held, post or wall



mounted, with H-stand or plate-stand support. Top speed of high 10,000-30,000rpm, reduces processing time significantly. Big safety switch for unexpected emergency stop. Smooth motor drive makes working very safe and comfortable. Additional feature of automatic overload protection increases the life span of the motor. Smooth start also prevents unnecessary spills.

### Process of dispersing:

The material is sucked in to the head axially, then accelerated using the rotor's high rpm rate, circumferential or peripheral velocity. The centrifugal acceleration between the outer rotor wall and the inner stator wall propels the material through the stator shearing slits.

### Quick-change-system:

MRC tools consists of only a few parts. One shaft, one axle, one Teflon bearing and one rotor stator. No special tools are needed to disassemble. Only requirement is a simple piece of cloth.

### Optional Dispersing shaft: SS5CSR5. Model: DS-500/5

- Volume 1-50 ml • Max. Circum. Speed 5,8m/sec
- Applications: Dispersing shaft 5mm for solid/liquid media Dispersing of tissue decomposition, clinical & medical diagnostics and suspensions. Suitable for centrifuge products and Eppendorf tubes, centrifugal glasses etc. Dia. 5mm.



Model	HOG-500
<b>Motor type</b>	Universal motor, 500 Watt
<b>Voltage / Frequency</b>	110-120V/60Hz , 220-240V / 50-60 Hz
<b>Speed range (rpm)</b>	10,000 - 30,000
<b>Max. Circum. Speed</b>	22.7-36m/sec
<b>Speed control type</b>	Dial knob 7 stage
<b>Working Volume (ml, H<sub>2</sub>O)</b>	10-40000ml (Optional)
<b>Max. Viscosity</b>	10,000mPas
<b>Noise emission(drive only)</b>	< 79 dB(A) at 30,000 rpm
<b>Material of Dispersing Shaft</b>	SS 316L stainless steel / PTFE
<b>Dimension LxWxH (mm)</b>	70 x 70 x 255
<b>Weight (kg)</b>	1.3
<b>Operating Environment</b>	0-40°C, 85% rel. humidity
<b>Protection class</b>	IP20

### Features:

- Viscosity up to 10,000 mPas
- Continuously adjustable speeds for better results
- Light-weighted and small-dimensioned for better handling
- Triple safety of the drive, overload protection & Smooth start - against jerky work, safety switch
- 316L steel High quality dispersing tools as standard for better resistance to corrosion
- Quick-change system of the dispersing tools for a short changing time between preparations.

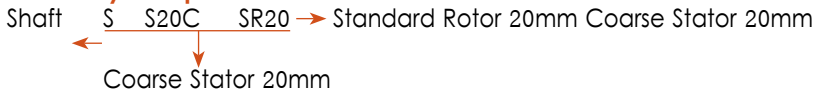
### Homogenizers of HOG-500-1/2

Model	Package Include	Power supply
HOG-500-1 (Package 1)	HOG-500 drive, with dispersing shaft 1 for solid/liquid media & H-600 stand, 10-5000ml of water	110-120V, 50/60Hz 220-240V, 50/60Hz
HOG-500-2 (Package 2)	HOG-500 drive, with dispersing shaft 2 for W/O or O/W emulsions & H-600 stand, 10-5000ml of water	110-120V, 50/60Hz 220-240V, 50/60Hz

Model	Description of Dispersing Shaft	Applications / Industry Examples	Treatable Volume (ml)	Max. Circum. Speed (m/sec)	Dia. of the Rotor (mm)	Min/Max Emersion Depth (mm)	Ultimate Fineness (µm)	
							Suspension	Emulsion
DS-500/1	Solid/liquid media	Coarse crushing of hard solids in liquid / Pharma, Petro Industry, Ceramic industry	10-5000	23.5	20	40/175	10-50	1-10
DS-500/2	W/O or O/W emulsions	Emulsions, intensive mixing of w/o & o/w emulsions. Dispersing of resins & pigments for paint & lacquer industry / Sewage/Pollution Control, Paint Industry, Paper & Tissue Industry, Pharmaceutical industry	10-5000	23.5	20	40/175	10-50	1-10

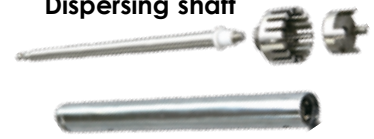
\* All kind of sterilization possible

### Summary of Options:



- Material used for shaft is high grade fine 316L stainless steel and PTFE for seal
- Dispersing shaft consists of shaft tube, axle, PTFE seal, a rotor and a stator.

### Components of Dispersing shaft



### Stators:



**18900118**  
S20C Stator  
20 coarse (C)



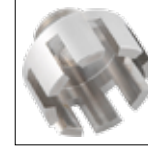
**18900119**  
S20F Stator  
20 fine (F)



**18900120**  
S30C Stator  
30 coarse (C)

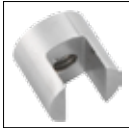


**18900121**  
S30F Stator  
30 fine (F)



**18900122**  
S40C Stator  
40 coarse (C)

### Rotors:



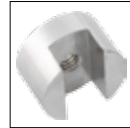
**18900123**  
SR20 Rotor  
Standard 20



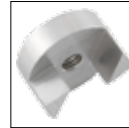
**18900124**  
SR30 Rotor  
Standard 30



**18900125**  
CR20 Rotor  
Cutter rotor 20



**18900126**  
CR30 Rotor  
Cutter rotor 30



**18900127**  
MR20 Rotor  
Mixing rotor 20



**18900128**  
MR30 Rotor  
Mixing rotor 30



**18900129**  
ER20 Rotor  
Emulsifying rotor 20



**18900130**  
ER30 Rotor  
Emulsifying rotor 30

Model	Description of Shaft	Applications / Industry Examples	Treatable Volume (ml) (H <sub>2</sub> O)	Max. Circum. Speed (m/sec)	Dia. of the Rotor (mm)	Min/Max Immersion Depth (mm)	Ultimate Fineness (µm)	
							Suspension	Emulsion
<b>18900118/18900125</b>	Dispersing tool with knives for brous/stringy materials	Fragmentation of vegetable, animal and human tissues / Sewage/Pollution Control, Pharma, Food, Paper & Tissue, Tobacco Industry	10-5000	23.5	20	40/175	10-50	1-10
<b>18900118/18900127</b>	Solid/liquid media	Suspensions, intensive mixing / Ceramic Industry, Paint Industry	10-5000	23.5	20	40/175	10-50	1-10
<b>18900119/18900125</b>	Dispersing tool with knives for brous/stringy materials	Fragmentation of vegetable, animal and human tissues / Sewage/Pollution Control, Bio Technology, Pharma, Food, Paper & Tissue, Tobacco Industry	10-5000	23.5	20	40/175	10-150	1-10
<b>18900119/18900127</b>	Solid/liquid media	Emulsions, intensive mixing of w/o & o/w emulsions / Ceramic, Cosmetic, Paint, Food, Paper & Tissue, Petro Chemistry Industry	10-5000	23.5	20	40/175	10-150	1-10
<b>18900120/18900124</b>	Solid/liquid media	Coarse crushing of hard solids in liquid / Sewage/Pollution Control, Pharma, Food, Paper & Tissue, Petro Chemistry Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900120/18900126</b>	Dispersing tool with knives for brous/stringy materials	Fragmentation of vegetable, animal and human tissues / Sewage/Pollution Control, Pharma, Food, Paper & Tissue, Pharma Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900120/18900128</b>	Solid/liquid media	Suspensions, intensive mixing / Ceramic Industry, Paint Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900121/18900124</b>	Solid/liquid media	Dispersing of resins and pigments for paint and lacquer industry / Sewage/Pollution Control, Paint Industry, Paper & Tissue, Pharma Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900121/18900130</b>	W/O or O/W emulsions	Emulsions, intensive mixing of w/o and o/w emulsions. Dispersing of resins and pigments for paint & lacquer industry / Sewage/Pollution Control, Paint Industry, Paper & Tissue, Pharma Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900121/18900128</b>	Solid/liquid media	Emulsions, intensive mixing of w/o and o/w emulsions / Sewage/Pollution Control, Cosmetic, Pharma, Tobacco Industry	100-8000	36.1	30	40/175	5-25	1-5
<b>18900120/18900127</b>	Stirring Shaft	High speed mixing without crushing / Ceramic, Food, Sewage/Pollution Control Industry	250-20000	36.1	30	40/175	High-Speed Mixer	
<b>18900122/18900128</b>	Stirring Shaft	High speed mixing without crushing / Ceramic, Food, Sewage/Pollution Control Industry	1000-40000	36.1	30	40/175	High-Speed Mixer	

\* All kind of sterilization possible

# HOMOGENIZERS Spin-Mix

## HOG-08/09/011, Homogenizers Spin-Mix

Homogenizer can be widely used in mixing and dispersing, emulsifying for Medicine, foods, Cosmetics, Industrial products.



HOG-08

HOG-09

HOG-011

### Features:

There are many uses for homogenizer as following different fields:

- Chemical: Dyestuff, pigment, additive .. etc.
- Medical: Biochemistry, virus, bacteria, yeast .. etc.
- Pharmacy: Medicine test, vaccines, syrup .. etc.
- Food: Trial, study check.
- Others: Magnetized chemical tape analysis, silicone .. etc.

### Optional Tank Sets:



COTR-100  
30~100ml



COTR-200  
60~200ml



COTR-500  
100~500ml



COTR-1000  
500~1000ml

Model	HOG-08	HOG-09	HOG-011
Motor	100W	250W	150W High Frequency Motor
Max. Rotational Speed	18,000rpm	15,000rpm	18,000rpm
Capacity	30~1,000ml	30~1,000ml	30~1,000ml
Timer	15 min or Continuous running	15 min or Continuous running	1~60min or Continuous running
Dimensions(mm)	W250×D250×H396	W250×D250×H396	W250×D250×H413
Weight	6kg	8kg	8kg
Control System	Thyristor Control System	Thyristor Control System	Inverter Control System
Power Source	AC100V 50/60Hz 3A	AC100V 50/60Hz 6A	AC100V 50/60Hz 5A



**HOG-24**

**Typical Samples:**

- Human, animal, plant cells
- Micro-organisms
- Soil and sediments
- Swabs and feces
- Drugs, polymers, lotions, etc.

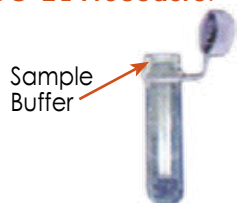
**Sample Preparations:**

As heat generated by grinding process will make part of sample tissue damaged, we recommend:

- After putting the sample into the sample tube, please preserve the sample for 6-12 hours at low temperature (below -60°C degree)
- Then take out for grinding to make the effects achieve the best.

**Overview of the HOG-24 Procedure:**

- Prepare lysis tube



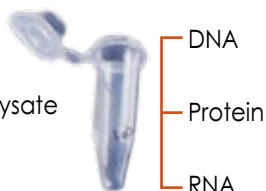
- Process about 30 seconds



- Centrifuge to pellet debris about 1 minute



- Transfer cleared lysate



**HOG-24, Homogenizer**

Fast, effective and reproducible homogenization of a wide range of samples, including hard to lyse tissues and cells. It also holds extraordinary powerful processing of even impact resistant samples such as bones or cartilage. The HOG-24 is an ideal solution for releasing DNA, RNA, Proteins, Enzymes, etc. from very tough samples while still retaining molecular integrity.

**Features:**

- "3D Rotating High Speed Motion" for quick disruption of those fibrous tissues and resistant cells
- 50 programmable memory settings and user optional condition settings
- A wide range of rotation speed settings from 4.0 m/s to 7.0 m/s, increment 0.05 m/s
- Brushless motor realizing no brush particle generation and no brush replacement
- Easy to remove sample tube holder and easy to fix sample tubes
- Easy to monitor the disruption process through the clear lid
- Simultaneously homogenize either 24x2.0ml/1.5ml/0.5ml or 12x5ml tubes
- Disposable tubes ensure no threat of cross-contamination
- Most samples can be processed in 35 sec. or less.



Model	HOG-24
<b>Speed Range</b>	4.0m/s - 7.0m/s (in steps of 0.05m/s)
<b>Cycle Duration</b>	1~90s (in steps of 1s)
<b>Pause Time</b>	0~2 minutes
<b>Acceleration</b>	≤2 sec. to max. speed
<b>Deceleration</b>	≤2 sec. to stop
<b>Programmable</b>	50 Saved Programs
<b>Number of Cycles</b>	10
<b>Display</b>	O-LED, High light and no visual angle limit
<b>Number of Samples</b>	1~24 samples
<b>Running Noise</b>	< 68db
<b>Weight</b>	25kg
<b>Dimensions (WxDxH)</b>	280mm x 360mm x 385mm

Code	Description
<b>301-13010-00</b>	HOG-24 AC 1 00-240V 50/60Hz
<b>301-13011-01</b>	Rotor for 24x2.0ml
<b>301-13011-02</b>	Rotor for 12x5.0ml
<b>301-13011-11</b>	Grind tube with 1.4mm Silica beads
<b>301-13011-12</b>	Grind tube with 2.8mm Silica beads
<b>301-13011-13</b>	Grind tube with 3mm Metal beads
<b>301-13011-14</b>	Grind tube with 0.7mm Garnet beads
<b>301-13011-15</b>	Grind tube with 0.15mm Carbide beads
<b>301-13011-16</b>	Grind tube with 0.25mm Carbide beads
<b>301-13011-17</b>	Grind tube with 0.1 mm Glass beads
<b>301-13011-18</b>	Grind tube with 0.5mm Glass beads



**GHP-4**  
250x250mm  
hotplate

**HP-4**  
175x175mm  
hotplate

**HP-1**  
115x115mm  
hotplate

Compact & lightweight hotplate, great to use in limited space. Making possible for processing of delicate materials at low critical temperatures.

### HOP Series Aluminium Top Hotplates

#### Uniform Heating at a Reasonable Price!

This modern range of aluminium hotplates provides superior temperature uniformity and stability is available in 4 sizes.



**GHP-4X2**  
250x500mm  
hotplate

#### Features:

- Chemical resistant top plate, easy to clean.
- Excellent heat conduction distributes the heat evenly and uniformly over the entire heating surface.
- Sensitive "stepless" temperature control is maintained by means of a hydraulic thermostat with minimum overshoot and undershoot Making possible the processing of delicate materials at low critical temperatures.
- Pilot lamp indicates when heat is on.
- Special radiation shields keep apparatus relatively cool during continuous operation.
- Supplied with a 3-wire line cord and sturdy screw type support device at the rear of the base to hold standard rod.

#### Application:

- Distillations, extractions & digestions
- Heat aqueous reagents
- Semiconductor baking
- Acid/Base digestions - trace metal analysis. etc.
- Sample drying
- General reagent heating
- Heating TLC plates
- Evaporations
- Warning/curing applications - pastes, adhesives, & solder
- Ideal for general lab heating
- Liquid evaporations



**E-1**  
Iron hotplate, up to  
450°C, dia. 80mm



support device at the rear of the base to hold standard rod.

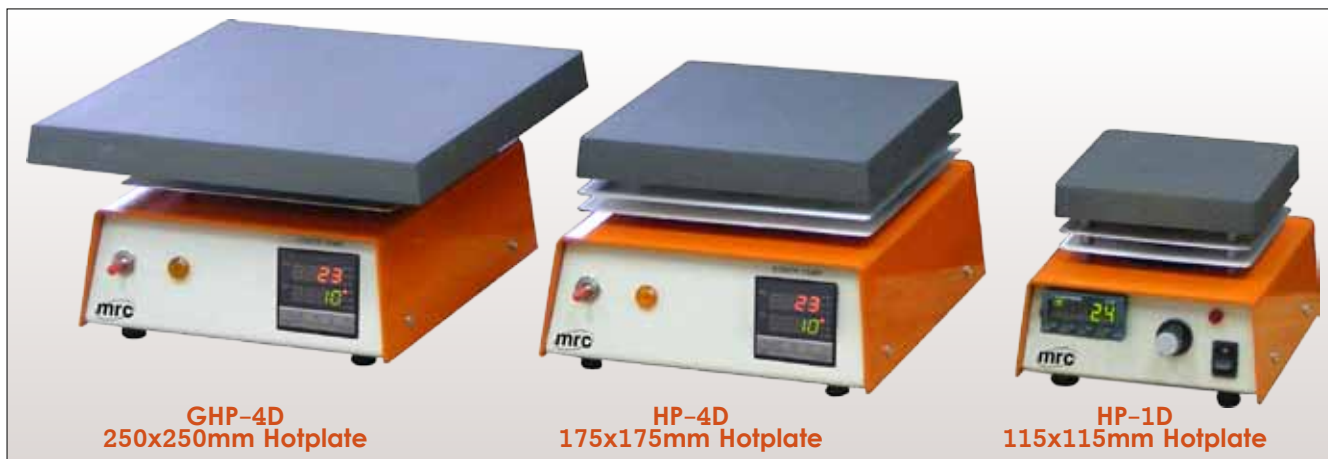
**GHP-4**  
250x250mm  
hotplate



**SHP-4X2D**  
250x500mm  
Digital Sand Bath

Model	Temperature range	Top plate	Dimensions	Watt	Weight
HP-1	40-300°C (optional 350°C)	115x115mm	W140xH110xD220mm	450W	1.2kg
HP-4	40-300°C (optional 350°C)	175x175mm	W200xH150xD260mm	750W	2.3kg
GHP-4	40-300°C (optional 350°C)	250x250mm	W250xH150xD260mm	1500W	3.3kg
GHP-4X2	40-300°C (optional 350°C)	500x250mm	W500xH150xD250mm	3000W	6.5kg
HP-1X5	40-300°C (optional 350°C)	588x115mm	W600xH150xD145mm	2000W	5kg
E-1	up to 450°C	Diameter 80mm	W120xH120xD180mm	450W	1.1kg





**GHP-4D**  
250x250mm Hotplate

**HP-4D**  
175x175mm Hotplate

**HP-1D**  
115x115mm Hotplate

**HP-D Series Digital & Programmable Hotplates, Aluminium Top**

**Application:**

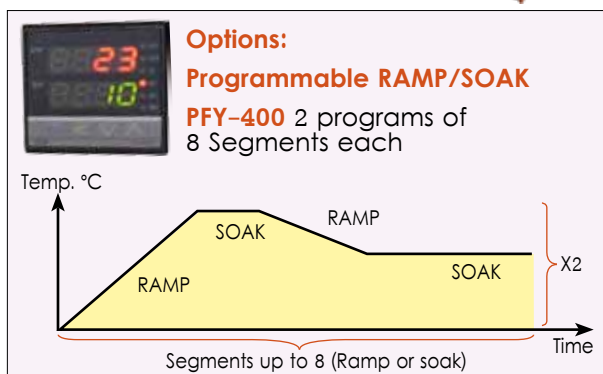
- Distillations, extractions and digestions
- Heat aqueous reagents
- Semiconductor baking
- Acid/Base digestions – trace metal analysis. etc.
- Sample drying
- General reagent heating
- Heating TLC plates
- Evaporations
- Warning/curing applications-pastes, adhesives, & solder
- Viscosity studies
- Reaction optimization
- Solubility studies
- Safety thermostat.

**Features:**

- Temperature can be displayed in °C or °F.
- Digital timer and ramp to temperature function.
- Digital set-point and read-out of actual temperature.
- PID microprocessor controller provides precise temperature regulation all over the temp. range, include the low temp close to the ambient.
- Temperature may be controlled either at the plate surface by internal sensor, or at the sample by a Thermocouple Immersion probe.
- Safety: in the event of broken sensor, power to the heater is shut-down.
- Temperature range: above ambient to 300°C (optional 400°C).
- Chemical resistant top plate, easy to clean.
- Excellent heat conduction distributes the heat evenly & uniformity over the entire heating surface.
- Pilot lamp indicates when heat is on.
- Special radiation shields keep apparatus relatively cool during continuous operation.
- Support device at the rear of the base.
- Option: External temp. sensor 200mm length, 3.2mm diameter.



**HP-1X5D**  
588x115mm Hotplate



**GHP-4X2D**  
Large surface for large loads, 500x250mm Hotplate



**2416P4 Programmer** 4 x programs of 16 segments

**RS232 Communication** This permit a single hotplate to communicate with computer.

**RS485 Communication** permits multiple hotplates to communicate with a single computer.

**Separate Control box** You can have your controller separated for wide variety of applications for example for glovebox.

Model	Temp. range	Top plate	Temp. stability	Dimensions	Watt	Weight
<b>HP-1D</b>	40-300°C (optional 400°C)	115x115mm	±1°	W140xH110xD220mm	450W	1.3kg
<b>HP-4D</b>	40-300°C (optional 400°C)	175x175mm	±1°	W200xH150xD260mm	750W	2.4kg
<b>GHP-4D</b>	40-300°C (optional 400°C)	250x250mm	±1°	W250xH150xD260mm	1500W	3.4kg
<b>GHP-4X2D</b>	40-300°C (optional 400°C)	500x250mm	±1°	W500xH150xD250mm	3000W	6.6kg
<b>HP-1X5D</b>	40-300°C (optional 400°C)	588x115mm	±1°	W600xH150xD145mm	2000W	5kg
<b>SHP-4X2D</b>	40-300°C (optional 400°C)	500x250mm	±1°	W500xH200xD250mm	3000W	6.6kg



HOP-5843



HOP-6116-1



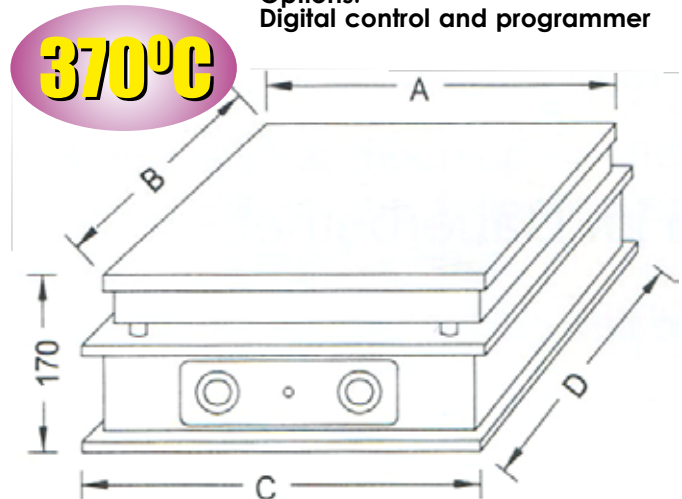
HOP-5843D  
Digital Control

### HOP-3030-6116, Hotplate With Wattage Power Control Or Digital PID Control

Electrical hotplates with variable wattage control. Robust construction for continuous performance. Aluminium alloy hotplate. Because of the asymmetrical, long-term heating system (hotplate corners and edges are subjected to more heat) an even temperature is guaranteed over the entire heating surface. Asbestos-free insulation. The housing is constructed from high-grade, stainless steel No. 1.4301, whereby the central section has been additionally sprayed in orange. Four adjustable feet ensure extra stability. Connecting cable approx. 1,7 m. long.



Options:  
Digital control and programmer



#### Hot plates with wattage power control:

Type	Temp. Range	A (mm)	B (mm)	C (mm)	D (mm)	Watt	Volt	Weight
HOP-3030	max. 370°C	300	300	312	312	1800	230	10kg
HOP-3535	max. 370°C	350	350	358	358	2200	230	12kg
HOP-4429	max. 370°C	290	440	308	458	2400	230	13kg
HOP-5035	max. 370°C	350	500	364	514	2850	230	18kg
HOP-5843-230	max. 370°C	430	580	442	592	4000	230	25kg
HOP-5843-400	max. 370°C	430	580	442	592	4000	3x400, N+PE	25kg

#### Hot plates with wattage power control and thermostatic control:

Type	Temp. Range	A (mm)	B (mm)	C (mm)	D (mm)	Watt	Volt	Weight
HOP-3030C-110	30 - 110°C	300	300	312	312	1000	230	11kg
HOP-3030C-370	100 - 370°C					1800		
HOP-3535C-110	30 - 110°C	350	350	358	358	1150	230	13kg
HOP-3535C-370	100 - 370°C					2200		
HOP-4429C-110	30 - 110°C	290	440	308	458	1650	230	14kg
HOP-4429C-370	100 - 370°C					2400		
HOP-5035C-110	30 - 110°C	350	500	364	514	1800	230	19kg
HOP-5035C-370	100 - 370°C					2850		
HOP-5843C-110	30 - 110°C	430	580	442	592	2000	230	26kg
HOP-5843C-370-230	100 - 370°C					4000	230	
HOP-5843C-370-400	100 - 370°C					4000	3x400, N+PE	
HOP-6116C-110	30 - 110°C	610	160	200	618	1000	230	11kg
HOP-6116C-300	50 - 300°C					2000		

**CERA-Series, CERAN® Hot Plate With Thermostatic Temp. Control 50-500°C**



CERAN® an unusual glass ceramic material which is highly resistant to breakage and temperature changes, free from distortion, permeable to ultra-violet light and highly acid-resistant.

Construction: The low mass CERAN® plate is electrically heated over its full surface and is bedded into a stainless steel frame which is mounted on an internally insulated stainless steel housing. The temperature control system consists of an



electronic regulator, activated by a NiCr-Ni temperature sensor (adjustable 50 ... 500°C) installed in a Aluminium pressure cast housing.

Warm-up time, e. g. 500°C in 8 minutes.

Four feet, which can be individually adjusted to an approx. height of 8 mm to ensure horizontal stability.

Type 4A has 4 supporting rod holders (distance 100mm) In Types SR and EB, the electrical connection between the control housing and the hot plate is protected by a flexible metal hose.



**Options: Digital control and programmer**

**CERA-Series - with built-in control housing, CERA-SR-Series - with separate control housing**

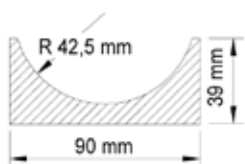
Types	WxHxD(mm)	CERAN® mm	Watt	Volt	Weight
CERA-4314 / CERA-4314SR	440x100x300	430x140	1500	230 V, 50-60 Hz	5.0kg
CERA-2828 / CERA-2828SR	290x100x410	280x280	2000	230 V, 50-60 Hz	5.5kg
CERA-4328 / CERA-4328SR	290x100x560	280x430	3000	230 V, 50-60 Hz	6.5kg
CERA-4343 / CERA-4343SR	440x100x560	430x430	4400	3x400 V, N+PE, 50-60 Hz	9.0kg
CERA-5843 / CERA-5843SR	590x100x560	580x430	5700	3x400 V, N+PE, 50-60 Hz	11.5kg

The conducting wire between control housing and hot plate measures 1.3 m.

**Accessories for CERA-4314SR**

**ST-12** - support rod 12mmØ, 650mm.

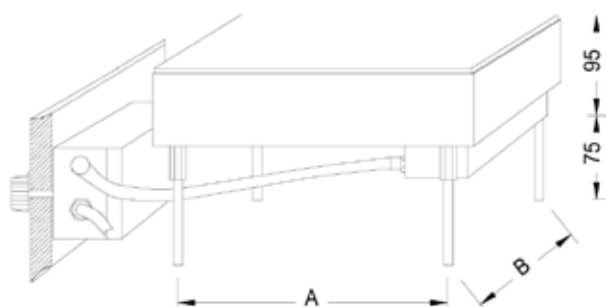
**AM-25** - interchangeable top mulde for round bottom flask 250ml.



**CERA-EB-Series - as built-in units for bench installation**

Types	WxHxD(mm)	CERAN® mm	AxB mm	Watt	Volt	Weight
CERA-2828EB	290x100x290	280x280	240x240	2000	230 V, 50-60 Hz	5.5kg
CERA-4328EB	290x100x440	280x430	240x390	3000	230 V, 50-60 Hz	6.5kg
CERA-4343EB	440x100x440	430x430	390x390	4400	3x400 V, N+PE, 50-60 Hz	9.0kg
CERA-5843EB	590x100x440	580x430	540x390	5700	3x400 V, N+PE, 50-60 Hz	11.5kg

The conducting wire between control housing and hot plate measures 0.65 m.



type = Order-No. other voltage on request.

**Further Fabrications**

High temperature TITANIUM hot plate up to 600°C - Precision hot plates - Stand hot plates with supporting rod - rapid incinerator - Multi-purpose, extremely deep, heating bath - sand bath - Series heating units - Multipurpose heating equipment - Water- and Oil baths - Development - Special orders. The right to make modification serving further technical development, is reserved.



HOP-2820-TIT

**Temp. controller TR 28-3T**

This microprocessor controlled temperature regulator is suitable for the high temperature hot plate. After adjustment of the temperature setpoint by the membrane keypad, the PID controller keeps it constant (control deviation 2 K or less).

**Programmer PR 5-3T**

The microprocessor controlled ramp regulator offers a comprehensive time/temperature regulation for the high temp. hot plate. Pressing the START key activates a program of up to 5 ramps. Max. 5 ramps (consisting of ramp time, constant temp. and time of constant temp.) can be programmed. 3 program sets can be loaded into the non-volatile memory. A programmed lead time enables the activation of the start up to 99 hours in advance.

Every temperature and time parameter can be selected with its own key. Consequently the setting is easy and clear. It is possible to pass over single ramps by setting the according parameter to '0'. Every set value can be controlled during a program.

Back-up by an EEPROM. The device is equipped with a change-over switch to continuous control; buzzer signal at the program.

**HOP-2820-TIT, High temperature Hotplate of TITANIUM up to 600°C, for continuous operation****with PID – Temperature Controller or Programmer.**

High temperature hot plate of TITANIUM up to 600°C  
HOP-2820-TIT.

This high temperature hot plate reaches its max. temp. of 600°C within about 20 min. The upper plate consists of TITANIUM, overall dim. 280 x 200 mm. The marked area of constant temperature is 230 x 160 mm. Owing to a special insulation the device can be placed even on surfaces sensitive to heat. Metal sheets all around keep the casing temperature to a minimum.

The insulated snap-lid ensures little loss of heat and short times of warming. Between the closed lid (inner surface Ceran<sup>®</sup>) and the heating plate remain 26 mm, enabling an intensive heating of plain parts at high precise temperatures. The whole casing is made of stainless steel. The temperature regulator is connected by two plugged cables.

HOP-2820-TIT is available either with a temperature controller or with a programmer. The temperature controller keeps the device constant to an adjusted temperature within the whole range.

The programmer allows the control of certain programs including phases of heating up, constant temperature and cooling.

**Equipment of PR5-3T and TR 28-3T**

2-poled main switch; individual adjustment of proportional range, derivative/integrating factor and cycle time; control range limitation (to avoid the setting of values not useful or harmful to an application); contact maker input, actual value correction, junction bush for high temperature hot plate, wattage power control 1...100%, uninterrupted switching. Both regulators show the actual value constantly. Furthermore the programmer shows the remaining time of a ramp. When the SET key is pressed, the display changes to show the setpoint. On request the devices are available with a temperature limiter to avoid superheating.

Type	HOP-2820-TIT without cover	HOP-2820-TIT-C with cover
<b>Titanium plate size</b>	280 mm x 200 mm	
<b>Constant heating area</b>	230 mm x 160 mm	
<b>Max. temperature</b>	600°C	
<b>Voltage</b>	230 Volt / 50..60 Hz	
<b>Power</b>	2000 Watt	
<b>Spread of temperature</b>	±2K	
<b>Cable length (standard)</b>	1.5m	
<b>Overall dimensions</b>	350 mm x 300 mm	
<b>Height</b>	110 mm	145 mm
<b>Effective height with closed cover</b>	-	26 mm*
<b>Weight</b>	8 kg	10 kg

\*Covers for more effective height on inquiry



HOF-604A

**HOF-604 Series, Ashing & Burn Off Hotplate Furnace Up To 950°C**

For single & Series incineration of solid & liquid substances. The operating temperature of approx. 950°C can be reached within the space of a few minutes. The upper platform has 8 recesses with a diameter of 35 mm which can accommodate porcelain crucibles of up to 50mm diameter for drying, pre-heating & fuming-off. The uninhibited exposure to oxygen speeds up the incineration process. The inclined position of the crucibles in the lower incinerating bed (which has a length of 400 mm) allows excellent observation and access to the contents during operation. Modern design, easy to operate, reliable, space-saving and of very good value.

**Model HOF-604:** The upper part and the main housing are made of high grade stainless steel, the housing comes with an orange finish (RAL 2002). There is electrical wattage control.

The appliance is fitted with a safety switch which cuts off the mains supply to the heater immediately the service flap is opened. When the flap is closed, power is restored to the element. The ready-to-use apparatus is delivered complete with a 1.8 m cable & Schuko plug.

**Model HOF-604A:** As HOF-604 but with an additional electronic temperature regulation by means of a performance control.

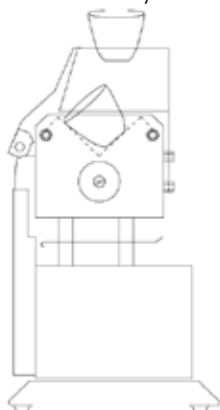
**Model HOF-604D:** As HOF-604A, but with an additional Eurotherm PID temperature controller up to 999°C, this is controlled by a built-in, K type thermocouple.

The pre-selected temperature is shown on the digital display with a constant ACTUAL temp.

950°C



HOF-604D



Model	HOF-604	HOF-604A	HOF-604D
<b>Control</b>	Power	Power & Thermostat	Digital
<b>Performance</b>	2500 Watt		
<b>Width &amp; Depth</b>	450mm x 180mm		
<b>Height</b>	310mm		
<b>Maximum crucible diameter</b>	50mm		
<b>Maximum crucible height</b>	50mm		
<b>Weight</b>	7.4kg	8.0kg	7.8kg



E-1  
Iron hotplate, up to 450°C, dia. 80mm

GHPI-2D

450°C

GHPI-3D

Model	Temperature range	Top plate	Dimensions	Watt	Weight
<b>E-1</b>	up to 450°C	Diameter 80mm	W120xH120xD180mm	450W	1.1kg
<b>GHPI-2D</b>	up to 450°C	220x220mm	W260xH195xD260mm	2000W	10kg
<b>GHPI-3D</b>	up to 450°C	300x300mm	W340xH195xD340mm	3500W	12kg



#### SH/SGK/SG/SGR Series, Heating Units Hotplate for supporting rod, Plate diameter 85mm and 150mm

##### Series and supporting rod hot plates

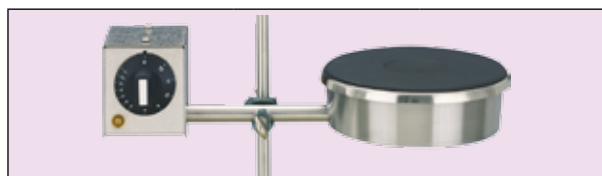
Smoothly finished, cast-iron, hot plate with concave central expansion recess for warp free operation. All housing parts are constructed from stainless steel and each unit has a screw-on fitting for a supporting rod. The appliances have been specifically designed for non-stop use.

##### Regulation of models SG/SGK/SH

Each unit has a heating output controller that enables a variable adjustment between 10 - 100%.



**Regulation of model SGR** Each unit has an additional, built-in, electronic relay and an extra low-voltage, 3-pole diode output bushing for an optional contact thermometer. When in use, the regulation via the thermometer takes automatic precedence. Without the thermometer, the operation of the SGR is the same as the SG model.



Type	SH-15	SH-85
plate-Ø (mm)	150	85
Wattage (W)	1000	450
Weight (kg)	1.7	1.0
Length (mm)	340	280
Height (mm)	80	
Depth (mm)	150	110
Voltage	230..240 V, 50-60 Hz	



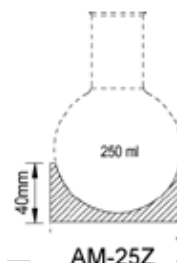
Type	SGK-1	SGK-4	SGK-6
No. of units	1	4	6
Wattage (W)	450	1800	2700
Weight (kg)	1.5	4.8	7.0
Length (mm)	125	485	725
H x D (mm)	145 x 155		
Space between units	120mm		
Voltage	230..240 V, 50-60 Hz		

Plate diameter 85mm



Type without relay	SG-1	SG-2	SG-3	SG-4	SG-5	SG-6
Type with relay	SGR-1	SGR-2	SGR-3	SGR-4	SGR-5	SGR-6
No. of units	1	2	3	4	5	6
Wattage (W)	500	1000	1500	2000	2500	3000
Weight: SG (kg)	2.8	5.2	7.6	10.0	12.4	14.8
Weight: SGR (kg)	2.9	5.4	7.9	10.4	12.9	15.4
Length (mm)	180	355	530	705	880	1055
H x D (mm)	160 x 210					
Space betwin units	175mm					
Voltage	230..240 V, 50-60 Hz					

Accessories	Type	SH-85	SH-15	SGK	SG	SGR
Support rod, 12mmØ, 660mm	ST-12			X	X	X
Holder for contact thermometer	HK-3					X
Cable for contact thermometer	SK-83					X
Sand bath crucible	SA-14		X		X	X
Interchangeable top with recess for 250ml round bottom flask	AM-25Z	X		X		





Model	PHP-4429	PHP-4429/2P
Voltage	230-240V, 50/60Hz	2 x400 V,N+P
Performance	3300 Watt	
Plate size	440mm x 290mm	
Temp. Range	20°C - 450°C	
Constant Temp.	±1 K	
Width and Depth	310mm x 475mm	
Height	205mm	
Weight	26kg	

**Accessories:**

S-3P	Cable with plug for temp.-fuse, time itch or contact-thermometer
TS-Series	Temperature-fuse (±5°C) 82-128-156-170-182-212-228-254°C

**Details and structure of PHP-4429**

The hot plate is constructed of solid, low-distortion GG15 casting. Cold housing, also in continuous operation. Material No. 1.4301, from rustproof high grade steel. Centre section is additionally sprayed in orange. Four adjustable feet for extra stability. Study construction, 150 kg max. hot plate load. Ready for connection with 1.5 m. cable.

**PHP-4429 / PHP-4429/2P, Digital Precision Hotplate up to 450°C**

**Temperature Range: 20 - 450°C**

PHP-4429 is a hot plate with automatic control for precise temperatures from 20 to 450°C. The required temperature is preset on the digital regulator and remains automatically constant, The actual temperature is continuously displayed with 13mm high numbers. The long-lasting electrical heating unit can be used in three heating stages - 825 - 1650 - 3300 Watt. Each stage can be finely tuned from 10 to 100% by an electronic output control to prevent overheating and any after- heating due to excessive power. The heating stages 825 and 3300 Watt, heat the total area of the plate. The special 1650 Watt stage heats only the right-hand section of the plate. Due to creeping heat, the temperature drops off from the right-hand section to the left-hand plate edge, by approx. 40% (temperature decline).

A low voltage 3-pole socket mounted on the right-hand side of the housing allows the following extras to be connected (however not conditional):

1. Time switch, for switching the heating unit on and off at preset times.
2. Contact Thermometer
3. Temperature fuse cut-out

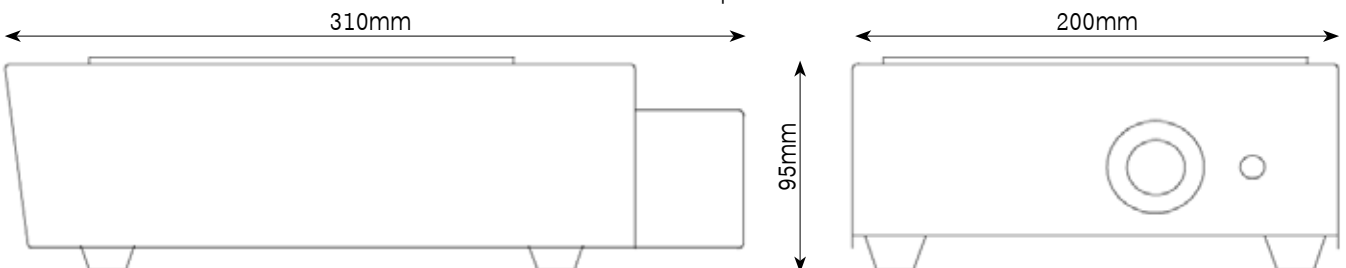
As temperature fuses must have heat contact, a 4mm diameter hole has been bored on the edge of the right-hand plate for their insertion. The heating unit is automatically cut off from the mains supply after the fuse blows and the contact has switched to the off position. The fuse has to be renewed once it has blown.



Type	HOP-1717
voltage	230 - 240 V, 50-60 Hz
performance	1200 Watt
glass ceramic	175 mm x 175 mm
heating surface	145 mmØ
width and depth	200 mm x 310 mm
height	95 mm
Weight	2.8 kg

**HOP-1717, High power, rapid, glass ceramic hotplate up to 500°C**

The glass ceramic used for the heating surface is manufactured by the Schott company and is in use in millions of households. This glass ceramic is highly resistant to breakage and sudden changes of temp. (a temperature shock of over 700°C can be withstood without damage), it is also distortion and pore-free as well as being permeable to ultra-violet light and resistant against chemicals. Construction: The low-density, glass ceramic hot-plate, electrically heated centrally over an area of 145 mm dia., is mounted on a high-grade, stainless steel housing. The variable temperature control system is regulated by an energy regulator 10..100% for temperatures up to 500°C. The energy regulator is housed in a separate, heat resistant container. Thereby ensuring that the regulator is not influenced by excess heat during non-stop operation. A lighted control lamp shows when the hotplate is switched on. The appliance has a integrated temperature sensor to safeguard against overheating. The ready-to-connect hotplate is delivered complete with a 1.8 m mains cable.





### PHP-3535F/6116F, Precision Hot Plates for non-stop operation

The heating surfaces of the hot plates are composed of a good heat conducting Aluminium alloy, and have a smooth anodized finish for easy maintenance. The electrical long-term heating ensures that the temperature remains uniform, even on the corners and edges. The microprocessor controlled digital regulator allows the operating temperature to be preset in 0.1°C stages up to 99.9°C and in 1.0°C stages for temperatures over 100°C. The preset temperature remains programmed, even when the equipment has been switched off. Presetting is only possible by using two fingers; this is to prevent any unintentional alterations that could occur by

accidentally touching only one key. The actual temperature is permanently displayed by 14mm high numerals after the keys have been released.

An adjustable self-protection against overheating prevents the hotplate and the substance to be heated from being subjected to dangerously high temperatures.

This protective device is activated when the START button has been depressed. A removable Plexiglass cover prevents any unauthorized adjustments.

All models are equipped with an electronic output regulator that allows the heating output to be adjusted between 10 to 100%, this prevents the hotplate exceeding the predetermined temperature and/or to avoid any after-heating effect. The temperature of all precision hotplates is measured with an integrated, quick-reaction sensor (PT 100).

All models are equipped with a 3-pole diode output bushing (extra-low voltage), to permit the connection of one of the following appliances:

1. Contact Thermometer – to measure the temperature directly from the heated material and to regulate.
2. Time switch – in order to heat or cool the apparatus at preset intervals.

Model PHP-6116F (long shape) is equipped with 5 screw-in sockets for support rods, at intervals of 125 mm.

Special Feature:

Due to the asymmetrical, quick-reaction special heating and thermal sensors as well as output adaptation to the thermal requirements, very precise temperatures with a good uniform heat are obtainable over the whole heating surface.



#### Accessories:

<b>SK-83</b>	Cable with plug for contact thermometer
<b>ST-12</b>	Support rod, 12 mm, 660 mm long
<b>HK-3</b>	Holder for contact thermometer

Model	PHP-3535F	PHP-6116F
<b>Voltage (Volt)</b>	230-240 V, 50-60 Hz	
<b>Performance (Watt)</b>	2200	2000
<b>Plate size</b>	350 x 350	610 x 160
<b>Temperature Range (°C)</b>	20 - 300	
<b>Constant temperature</b>	± 0.5 K	
<b>Width and Depth</b>	365 x 380	615 x 215
<b>Height (mm)</b>	155	160
<b>Weight (Kg)</b>	14.4	12.2





**PHP-Series, Precision Hot Plates non-stop operation**

The heating surfaces of the precision hot plates are composed of an efficient heat conducting Aluminium alloy, and have a smooth anodized finish for easy maintenance. The electrical long-term heating ensures that the temperature remains constant, even on the corners and edges. The microprocessor controlled digital regulator allows the operating temperature to be preset in 0.1°C stages up to 99,9°C and in 1.0°C stages for temperatures over 100°C. The preset temperature remains programmed, even when the equipment has been switched off. Presetting is only possible by using two fingers; this is to prevent any unintentional alterations that could

occur by accidentally touching only one key. The actual temperature is permanently displayed by 14mm high numerals after the keys have been released. An adjustable safety device against overheating prevents the hotplate and the substance to be heated, from dangerously high temperatures. A removable Plexiglass cover prevents any unauthorised adjustments. All models have an electronic output control that allows the heating output to be adjusted between 10..100%, this prevents the hotplate exceeding the preset temperature and/or avoids any after-heating. The temperature of all hotplates is measured with a built-in, quick-reaction sensor (PT 100). All models are equipped with a 3-pole diode output bushing (extra-low voltage), to permit the connection of one of the following appliances:

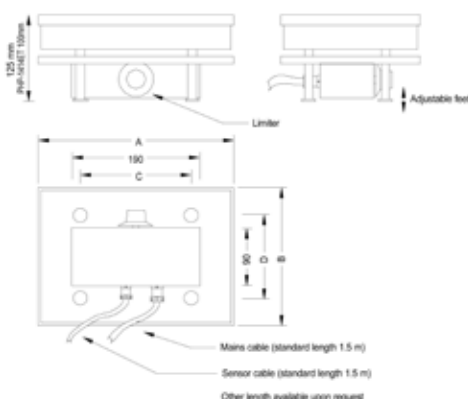
1. Contact Thermometer – to measure the temperature directly from the heated material and to regulate.
2. Time switch – in order to heat or cool the apparatus at preset intervals. Model PZ-6116 (long shape) is equipped with 5 screw-in sockets for support rods, at intervals of 125 mm.

**Special Feature:** Due to the asymmetrical, quick-reaction special heating and thermal sensors as well as output adaptation to the thermal requirements, very precise temperatures with a good uniform heat are obtainable over the whole heating surface.

\* PHP-4358 is also available for 2x400 V,N+PE For an additional charge, all models can be delivered with an anodized black or Teflon coated heating surface

Model	PHP-2028-1	PHP-2028-2	PHP-3535	PHP-6116	PHP-4358
Plate size (mm)	200x280	200x280	350x350	610x160	430x580
Temperature range (°C)	20 – 110	20 – 300			
Division (K)	bis 99,9°C 0,1K, über 100°C 1K				
Constant temp. (±K)	0.1	0.5			
Limiter (°C)	30 – 110	50 – 300			
Performance (Watt)	500	1100	2200	2000	3300
Voltage (Volt)	230 V, 50–60 Hz*				
Overall dimensions (mm)	210x300		365 x 380	620 x 215	445 x 610
Height (mm)	135		155		185
Weight (Kg)	7		14	12	22

Model	PHP-1414ET	PHP-2020ET	PHP-2820-1ET	PHP-2820-2ET	PHP-3535ET	PHP-6116ET	PHP-5843ET
Plate size (mm)	140x140	200x200	280x200	280x200	350x350	610x160	580x430
Weight (Kg)	2.2	4.0	5.4	5.4	10.8	8.9	21.2
Watt	450	800	500	1100	2200	2000	3300
Volt	230	230	230	230	230	230	230*
Max.Temp.	350	350	110	350	350	350	350
Limiter (°C)	-	100 – 350	30 – 110	100 – 350	100 – 350	100 – 350	100 – 350



PHP-SeriesET



Model	PHP-1414ET	PHP-2020ET	PHP-2820-1ET	PHP-2820-2ET	PHP-3535ET	PHP-6116ET	PHP-5843ET
A	140	200	280	280	350	610	580
B	140	200	200	200	350	160	430
C	100	120	160	160	286	478	510
D	100	120	120	120	286	98	437



SOD-3636

**370°C**

### SOD-Series, Sand Baths Up To 370°C

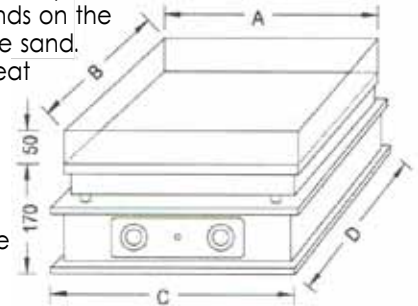
Electrical sand baths with variable temperature control, available with or without a thermostatic regulator. Robust construction for continuous performance. Aluminium alloy hotplate. Because of the asymmetrical, long-term heating system (hotplate corners and edges are subjected to more heat) an even temperature is guaranteed over the entire heating surface. The sand baths consist of an aluminium alloy hotplate with a screwed-on, sealed stainless steel frame with a usable height of 50 mm. The sand has direct contact with the hotplate. The housing is constructed from high-grade, stainless steel No. 1.4301, whereby the central section has been additionally sprayed in orange.

4 adjustable feet ensure extra stability. Connecting cable approx. 1.7m long, 230 Volt/3200 Watt with mains plug.

Sand baths: Change in temperature

The data shown depends on the quality & graining of the sand.

Since sand is a poor heat conductor, warming towards the surface of the sand occurs very slowly. These measurements were taken after a 90 minute heating period.



### Sand baths with wattage power control:

Type	Temp.	A (mm)	B (mm)	C (mm)	D (mm)	Watt	Volt	Weight
SOD-3636	Max. 370°C	360	360	358	358	2200	230	13 kg
SOD-5136		360	510	364	514	2850	230	21 kg
SOD-5944-230		440	590	442	592	4000	230	27 kg
SOD-5944-400							3x400, N+PE	

### Sand baths with wattage power control and thermostatic control:

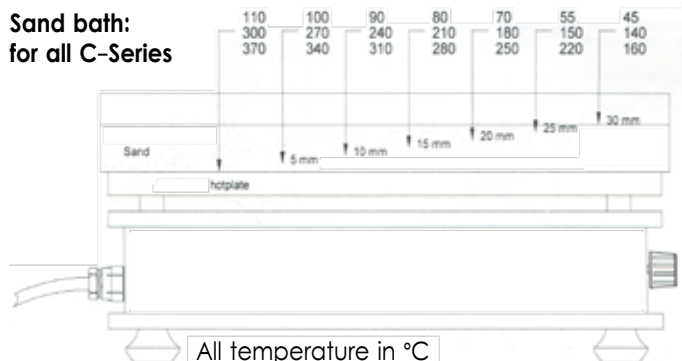
Type	Temp. Range	A (mm)	B (mm)	C (mm)	D (mm)	Watt	Volt	Weight
SOD-3636C-110	30 - 110°C	360	360	358	358	1150	230	14kg
SOD-3636C-300	50 - 300°C					2200		
SOD-3636C-370	100 - 370°C							
SOD-5136C-110	30 - 110°C	360	510	364	514	1800	230	21kg
SOD-5136C-300	50 - 300°C					2850		
SOD-5136C-370	100 - 370°C							
SOD-5944C-110	30 - 110°C	440	590	442	592	2000	230	28kg
SOD-5944C-300-230	50 - 300°C					4000	230	
SOD-5944C-300-400	50 - 300°C						3x400, N+PE	
SOD-5944C-370-230	100 - 370°C						230	
SOD-5944C-370-400	100 - 370°C					3x400, N+PE		

The appliances with a performance up to and including 3300 Watt by 230 Volt are delivered complete with a Schuko plug.

Appliances with a performance exceeding 3300 Watt by 230 Volt are only suitable for use with a permanent connection and, for that- reason, do not come with a plug.

Appliances with 2x400 V, N+PE and 3x400 V, N+PE are delivered with prepared connections but without a plug.

### Sand bath: for all C-Series





### MH-Series Hotplate Magnetic Stirrers

#### Powerful Stirring and Uniform Heating!

Quiet direct drive motor/magnet system provides speed from 100 to 1200 RPM.



**MH-1** 115x115mm Hotplate Stirrer

**GMH-5** For large capacity up to 30Liter, stir viscous solution

#### Features:

- Chemical resistant top plate, easy to clean.
- Excellent heat conduction distributes the heat evenly & uniformity over the entire heating surface.
- Sensitive "stepless" temperature control is maintained by means of a hydraulic thermostat with minimum overshoot & undershoot Making possible the processing of delicate materials at low critical temperatures.
- Pilot lamp indicates when heat is on.
- Special radiation shields keep apparatus relatively cool during continuous operation.
- Supplied with a 3-wire line cord and sturdy screw type support device at the rear of the base to hold standard rod.
- Uniform, stable heating
- Designed for continuous use, to handle fluids of varying viscosities in up to 30Liter capacity
- Available in 4 models to accommodate most laboratory applications requiring mixing and temperature control.
- Gentle or vigorous stirring

#### Applications:

- Warming/mixing applications - gels, pastes, & adhesives
- Standard reagent mixing and heating
- Preparing culture media
- Evaporation and distillation procedures
- Titration requiring heating and stirring of solution
- Gentle heating
- Micro scale chemistry
- General lab heating & stirring
- Sample drying
- Media preparation
- General microbiological applications

#### Specifications:

Model	Temp. range	Speed range	Capacity max.	Top plate	Dimensions	Watt	Weight
<b>MH-1</b>	40-300°C (optional 350°C)	100-1200rpm	8 Liter	115x115mm	W140xH110xD220mm	450W	1.9kg
<b>MH-4</b>	40-300°C (optional 350°C)	100-1200rpm	10 Liter	175x175mm	W200xH150xD260mm	750W	3kg
<b>MH-5</b>	40-300°C (optional 350°C)	100-1400rpm	25 Liter	175x175mm	W200xH150xD260mm	750W	3.4kg
<b>GMH-5</b>	40-300°C (optional 350°C)	100-1400rpm	30 Liter	250x250mm	W250xH150xD260mm	1500W	4.4kg

# HOTPLATES STIRRERS 300°C, 400°C Digital & Programmable

## MH-D Series Digital Magnetic Stirrers

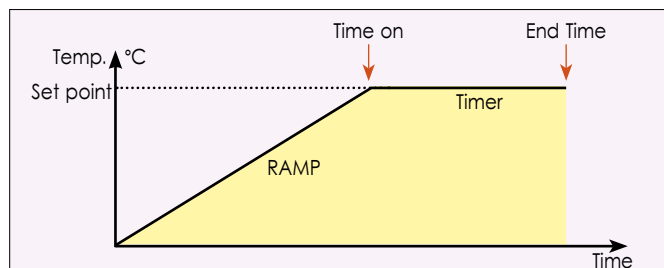
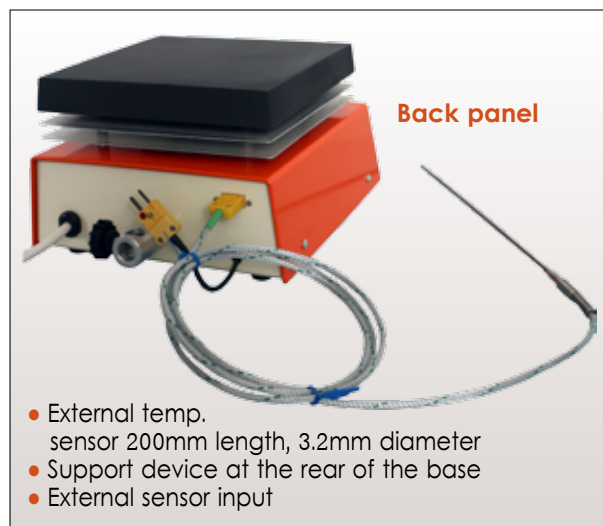
### Application:

- Warming/mixing applications – gels, pastes, and adhesives.
- Standard reagent mixing and heating.
- Preparing culture media.
- Evaporation and distillation procedures.
- Titration requiring heating & stirring of solution.
- Gentle heating.
- Micro scale chemistry.
- General lab heating & stirring.
- Sample drying.
- Media preparation.
- General microbiological applications.

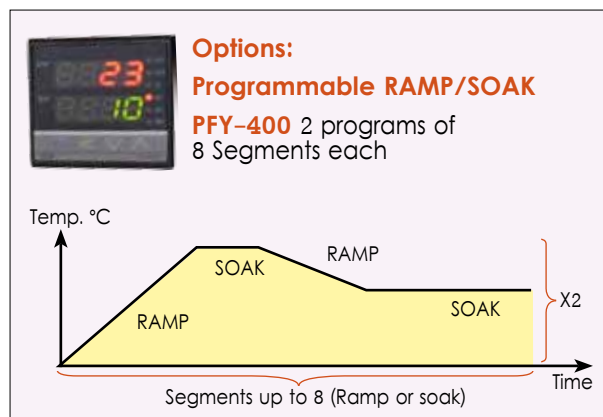


### Features:

- Temperature can be displayed in °C or °F.
- Digital timer and ramp to temperature function.



- Digital set-point and read-out of actual temperature.
- PID microprocessor controller provides precise temperature regulation all over the temp. range, include the low temp close to the ambient.
- Temperature may be controlled either at the plate surface by internal sensor, or at the sample by a Thermocouple Immersion probe.
- Safety: in the event of broken sensor, power to the heater is shut-down.
- Temperature range :above ambient to 300°C (optional 400°C).
- Chemical resistant top plate, easy to clean.
- Excellent heat conduction distributes the heat evenly and uniformity over the entire heating surface.
- Pilot lamp indicates when heat is on.
- Special radiation shields keep apparatus relatively cool during continuous operation.
- Designed for continuous use, to handle fluids of varying viscosities in up to 30Liter capacity.
- Available in 3 models to accommodate most laboratory applications requiring mixing and temperature control.
- Gentle or vigorous stirring.



### Option: Separate Control box

You can have your controller separated for wide variety of applications for example for glove-box.

**2416P4 Programmer** 4 x programs of 16 segments

**RS232 Communication** This permit a single hotplate to communicate with computer.

**RS485 Communication** permits multiple hotplates to communicate with a single computer.



### Specifications:

Model	Temp. range	Speed range	Capacity max.	Top plate	Dimensions	Watt	Weight
<b>MH-4D</b>	40-300°C (optional 400°C)	100-1200rpm	10 Liter	175x175mm	W200xH150xD260mm	750W	3kg
<b>MH-5D</b>	40-300°C (optional 400°C)	100-1400rpm	20 Liter	175x175mm	W250xH150xD260mm	750W	3.1kg
<b>GMH-5D</b>	40-300°C (optional 400°C)	100-1400rpm	30 Liter	250x250mm	W500xH150xD250mm	1500W	3.5kg



**MHK-4**  
175x175mm Ceramic hotplate stirrer



**HPK-4**  
175x175mm Ceramic hotplate

**500°C**

**MHK-1 & MHK-4, Analog Models**

**Features:**

- High impact strength, Acid and alkali resistance
- Heats rapidly up to 500°C in 8 minutes
- Stepless heat control
- Ceramic top remains perfectly flat to ensure maximum heat transfer.
- Reflective white top makes sample viewing easy.
- Not recommended for use with metal vessels.

**Applications:**

- Models are excellent for microscale chemistry
- General lab heating and stirring
- Sample drying
- Media preparation
- General microbiological applications.

**Back Panel**

support device at the rear of the base to hold standard rod



**HPK-4D & MHK-4D, Digital Models**  
**Measures Temp. on Plate or in Sample**

**Features:**

- Microprocessor closed-loop control
- Digital display of all parameters for easy operation. Temperature can be displayed in °C or °F
- PID microprocessor controller provides precise temperature regulation all over the temp. range, include the low temp close to the ambient.
- Temperature may be controlled either at the plate surface by internal sensor, or at the sample by a Thermocouple Immersion probe.



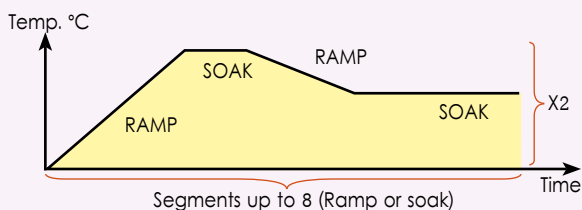
**MHK-4D**  
175x175mm



**Options:**

**Programmable RAMP/SOAK**

**PFY-400** 2 programs of 8 Segments each



**2416P4 Programmer** 4 x programs of 16 segments

**RS232 Communication**

This permit a single hotplate to communicate with computer.

**RS485 Communication**

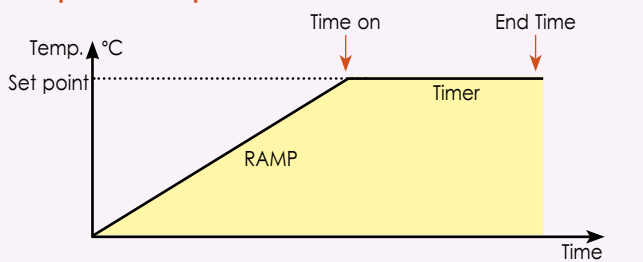
permits multiple hotplates to communicate with a single computer.



**Separate Control box**

You can have your controller separated for wide variety of applications for example for glove-box.

**Ramp rate to setpoint & timer**



**Description:**

- Solid state feedback control monitors & adapts to sudden changes in ambient or sample temperature, preventing boil-overs, ruined samples, and lost time.
- Digital display for quick and easy observation.
- Previous set point is stored in memory & will appear on the display when the unit is switched on.

Model	Temp. range	Top-plate	Temp. control	Magnetic stirrer
<b>HPK-4</b>	up to 500°C	175x175mm	Analog	No
<b>HPK-4D</b>	up to 500°C	175x175mm	Digital	No
<b>MHK-4</b>	up to 500°C	175x175mm	Analog	100~1200rpm
<b>MHK-4D</b>	up to 500°C	175x175mm	Digital	100~1200rpm
<b>HPK-1</b>	up to 500°C	115x115mm	Analog	No
<b>HPK-1D</b>	up to 500°C	115x115mm	Digital	No
<b>MHK-1</b>	up to 500°C	115x115mm	Analog	100~1200rpm



### HSD-135, LED Digital Magnetic Hotplate Stirrer

The magnetic stirrers of the HSD-135 is designed for a gentle to intense mixing of low viscous liquids and ideal for the digestion of organic and inorganic substances. Important aspects such as safety, convenience and cost savings have been considerably taken into account during the development of the MRC stirrers. This is reflected in various unique product advantages of our lab hot plates. The ceramic coated hot plates allow for immediate heat transfer resulting in quick heat up times and chemically resistant surface.

- LED-Display for accurate regulation of speed and temperature
- digital controlled speed and temperature
- Indicator for hot surface, even when the stirrer is shut-off
- connector for PT-1000
- integrated temperature control function
- compact construction, sealed housing (IP42)



### HS-135, BlueSpin Classic Magnetic Hotplate Stirrer

- Stainless steel and ceramic coated hotplates are optional
- Separated safety circuit, automatically stop heating when temperature over 350°C
- Motor with electronic speed control, constant speed even during changes in load
- Variable speed of motor
- High magnetic adhesion, prevent the stirrer bar escape
- Enclosed assembly with protection class IP42 and DC brushless motor guarantees long service.

### HSCD-7, BlueSpin LCD Digital 7 Inch Square Magnetic Hotplate Stirrer

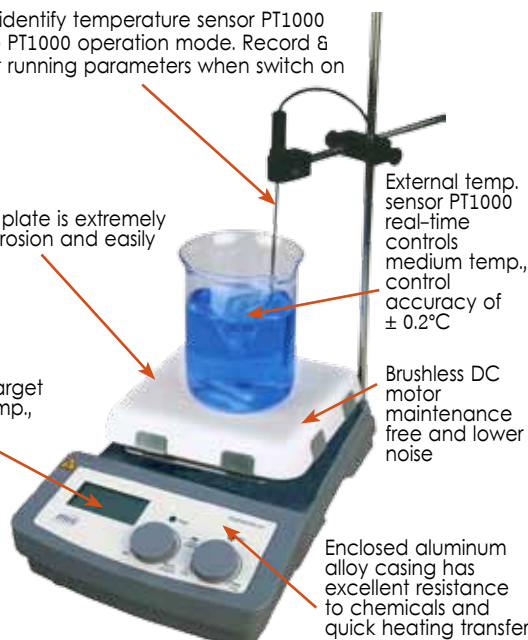
7 inch square hotplate magnetic stirrers are widely used in chemical synthesis, physical and chemical analysis, pharmaceuticals and other fields. PID temperature technology precise controls heating process, rapidly reaches target temperature and enhances control accuracy, heating temperature up to 550°C. Our 7 inch square magnetic stirrers have glass ceramic plate extremely resistant to corrosion and easy to clean. The heating models are suitable for external temperature sensor PT1000, display and control actual medium temperature.



Automatically identify temperature sensor PT1000 and transfer to PT1000 operation mode. Record & display the last running parameters when switch on

Glass ceramic plate is extremely resistant to corrosion and easily clean

LCD displays target and actual temp., as well as set speed and actual speed can be displayed



## Specifications:

Model	HSCD-7	HS-135	HSD-135	MUSH-10
Dimension of work plate (mm)	184 x 184	Ø135	Ø135	180 x 450
Work plate material	Glass ceramic	Stainless steel	ceramic coated	Stainless steel with silicone Film
Motor type	DC brushless motor	DC brushless motor	DC motor	DC motor
Motor rating input (W)	18	18	5	12
Motor rating output (W)	10	10	3	4
Power (W)	1050	530	515	490
Voltage (VAC)	100-120/200-240	200-240	200-240	200-240
Frequency (Hz)	50/60	50/60	50/60	50/60
Stirring positions	1	1	1	10
Max. stirring quantity (H <sub>2</sub> O), L	20	20	3	0.4 (each stirring position)
Max. magnetic bar(L x Ø) (mm)	80	80	50	40
Speed range (rpm)	100-1500	0-1500	100-1500	0-1100
Speed display	LCD	Scale	LED	Scale
Speed display resolution (rpm)	±1	-	±10	-
Heating output (W)	1000	500	500	470
Heating temperature range (°C)	RT-550, increment 1	RT-340	RT-280, increment 1	RT-120
Control accuracy of work plate (°C)	±1(<100°C) ±1%(>100°C)	-	±1(<100°C) ±1%(>100°C)	-
Safety temperature (°C)	580	350	320	140
Temperature display	LCD	Scale	LED	Scale
Temperature display accuracy (°C)	±0.1	-	±1	-
External temperature sensor	PT1000	N/A	PT1000	N/A
Control accuracy with external temperature sensor PT1000 (±°C)	±0.2	-	±0.5	-
Heating warning (°C)	50°C	N/A	50°C	N/A
Remote control (RS232 interface)	Yes	N/A	N/A	N/A
Protection class according to DIN EN60529	IP21	IP21	IP42	IP42
Dimension (W x D x H) mm	215 x 360 x 112	160 x 280 x 85	150 x 260 x 80	182 x 552 x 65
Weight (kg)	5.3	2.8	1.4	3.2
Permissible ambient temp. (°C)	5-40	5-40	5-40	5-40
Permissible relative humidity	80	80%	80%	80%



MUSH-10

### MUSH-10, BlueSpin 10-Channel Classic Magnetic Hotplate Stirrer

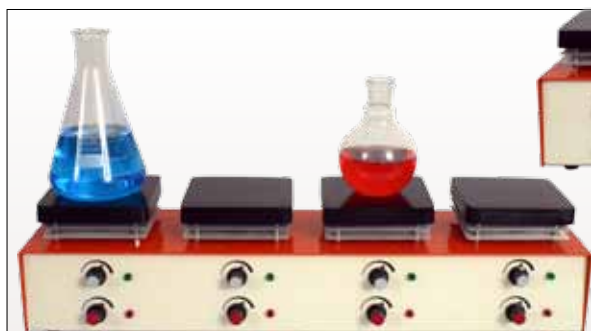
- Heating temperature up to 120°C
- High-performance multi-position magnetic stirrer with uniform temperature distribution
- Individually controlled stirring for consistency with various samples
- Electronic speed control motor provides constant speed
- DC brushless motor maintenance free and quiet running
- Stainless steel plate with silicone films, anti-slip and anti-corrosion.



# H HOTPLATES STIRRERS 300°C, 350°C Multi Position

## Multi-Position Hotplate Stirrers, 2,3,4 Or 6 Places

- Aluminium Top Plate 115x115mm
- Independent Heating & Stirring Control
- up to 300°C (optional 350°C)/1600rpm



MH-1/4, 4 position hotplate stirrer



MH-1/3  
3 position  
hotplate stirrer



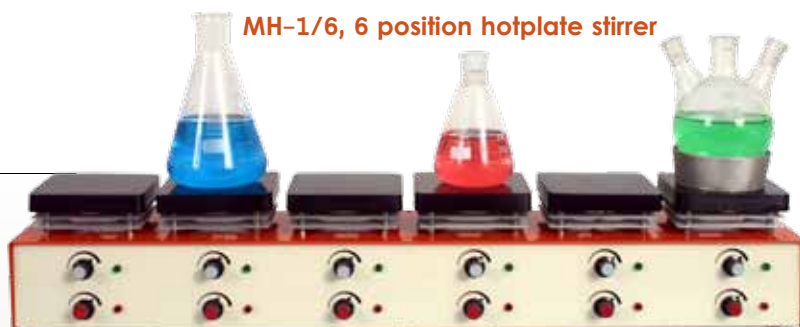
MH-1/2  
2 position  
hotplate stirrer



MH-1/2x2, 4 position hotplate stirrer



MH-1/3x2, 6 position hotplate stirrer



MH-1/6, 6 position hotplate stirrer

Excellent for Multi-use & a Wide Various Sample Testing • Systemized 2,3,4 and 6 Hotplate-Stirrer • Independent Heating and Stirring Control • Maximum Temperature of 300°C (optional 350°C) • Aluminium tops heat up quickly and uniformly. Great for low temp. applications • Units are built from durable cast aluminium cases & painted with chemically resistant paint.

### Model: MH-1/6, 6 Positions

- Multi position hotplate stirrer with six positions.
- Six individually controlled stirring and heating positions.
- Each position can be used to stir only, heat only or heat and stir at the same time.
- Ideal for a narrow bench-top or for applications needing support rack system.
- The top plates are chemical resistant and heat up quickly.
- Stirrers are equipped with strong magnets and high torque motors.

up to 8Liter of water for each position.

**Temperature range:** Up to 300°C (optional 350°C)

**Speed control:** Up to 1600RPM

**Dimensions:** Top plate 11.5x11.5cm,  
Overall W81xH14.5xD22cm  
(D includes support rod clamp)

**Power:** 230V (or 115V), 50/60Hz, 2400W-6x400W

**Net weight:** 12Kg.

### Model: MH-1/4, 4 Positions

Multi-position hotplate stirrer with four positions (in one row), Same as model MH-1/6, except dimensions which are: 60.5x14.5x22cm, weight 8 kg, power 1600 watt-4x400 watt.

**Model MH-1/3,** 3 positions, 1200watt

**Model MH-1/2,** 2 positions, 800watt

### Model: MH-1/2x2

- Multi position hotplate stirrer with four positions (in 2 rows 2+2).
- 4 individually stirring and heating positions.
- 4 chemical resistant top-plates, 11.5x11.5cm.
- The top plates are chemical resistant & heat up quickly.
- Stirrers are equipped with strong magnets and high torque motors.

**Temperature range:** Up to 300°C (optional 350°C)

**Speed control:** Up to 1600RPM

**Dimensions:** Top plate 11.5x11.5cm  
Overall W30xH14.5xD31cm  
(D includes support rod clamp)  
Placed in two rows 2+2

**Power:** 230V (or 115V), 50/60Hz, 1600W-4x400W

**Net weight:** 8Kg.

### Model: MH-1/3x2

Multi-position hotplate stirrer with six positions (in 2 rows 3+3) Same as model MH-1, except dimensions which are: 45x14.5x31cm, weight 12 kg, power 2400 watt-6x400 watt.

- 6 individually stirring and heating positions.
- 6 chemical resistant top-plates, 11.5x11.5cm.
- The top plates are chemical resistant and heat quickly.
- Stirrers are equipped with strong magnets and high torque motors.





**Ceramic Hotplate Stirrers Multi-Position, 2,3,4 Or 6 Places, 115x115mm**

Heat to 500°C on plate surface in minutes • Stir from up to 1600 rpm on each stirring position with individual controls  
 • Plate size for all units is 115x115 or 175x175mm • Solid ceramic heater surface for excellent chemical resistance



**Model: MHK-1/6, 6 Positions**

- Multi position hotplate stirrer with six positions.
- Six individually controlled stirring and heating positions.
- Each position can be used to stir only, heat only or heat and stir at the same time.
- Ideal for a narrow bench-top or for applications needing support rack system.
- The top plates are chemical resistant and heat quickly.
- Stirrers are equipped with strong magnets & high torque motors, up to 8Liter of water.



**Temperature range:** Up to 500°C

**Speed control:** Up to 1600RPM

**Dimensions:** Top plate 11.5x11.5cm,  
Overall W81xH14.5xD22cm  
(D includes support rod clamp)

**Power:** 230V (or 115V), 50/60Hz, 2400Watt-6x400W

**Net weight:** 12Kg

**Model: MHK-1/4, 4 Positions**

Multi-position hotplate stirrer with four positions (in one row), Same as model MHK-1/6, except dimensions which are: 60.5x14.5x22cm, weight 8 kg, power 1600 watt-4x400 watt.

**Model: MHK-1/3** 3 positions, power 1200watt

**Model: MHK-1/2** 2 positions, power 800watt

**Model: MHK-1/2x3**

Multi position hotplate stirrer with six positions (in 2 rows 3+3).

**Temperature range:** Up to 500°C

**Speed control:** Up to 1600RPM

**Dimensions:** Top plate 11.5x11.5cm  
Overall W45xH14.5xD31cm  
(D includes support rod clamp)  
Placed in two rows 3+3

**Power:** 230V (or 115V), 50/60Hz, 2400W-6x400W

**Net weight:** 12Kg

**Model: MHK-1/2x2**

Multi-position hotplate stirrer with 4 positions (in 2 rows 2+2) Same as model MHK-1/2x2, except dimensions which are: 30x14.5x31cm, weight 8 kg, power 1600 watt-4x400 watt.

**Model: MHK-4/3** 3 positions, 175x175mm plate, 3x1100watt=3300watt

**Model: MHK-4/2** 2 positions, 175x175mm plate, 2x1100watt=2200watt.





## CHS-29/32/34, Fluorescence/Chemiluminescence

CHS Fluorescence/Chemiluminescence imaging system is a powerful scientific grade imaging system that can handle both Fluorescence and Chemiluminescence imaging applications. Equipped with a high sensitivity cooled CCD camera, the ChemiScope offers the versatility and quality you need in a multipurpose imaging system with no sacrifice in sensitivity or quality. The ChemiScope offers a complete range of acquisition modes suitable for imaging the most commonly encountered fluorescent and chemiluminescence samples.

### Features:

- Three-Stage Peltier Cooled CCD Camera, -60°C below ambient
- High resolution up to 2048x2048
- F0.95 Ultra fast lens
- Multi-wavelength fluorescent light source
- Motorized filter wheel
- Optional motorized lift tray
- Easy-to-use capture software and versatile image analysis software.

### Application:

- Chemiluminescence - Western Lightning, ECL, ECL plus, CDP Star, Super Signal, CSPD, lumiGlo
- Nucleic acid detection - Ethidium bromide, SYBR™ Gold, SYBR™ Green, SYBR™ Safe, GelStar™, Fluorescein, Texas Red
- Protein detection - Coomassie blue, Silver Star, Sypro™ Red, Sypro™ Orange, Pro-Q Diamond, Deep Purple™
- Other - Petri dish imaging, Microplate imaging, Auto radiograph imaging.

### Capture and Analysis Software:

CHS Series analysis software is a sophisticated and intuitive software combining the power of a comprehensive set of analytical tools and automatic functions in an easy to use environment.

### CIS 1D Analysis Software

- Recognize and number gel lanes/bands and background automatically: add or delete any band, adjust or move any lane as you want
- Density contrast: scan appointed gel lane, describe the scan curve, and then compute the density integral calculus and peak value of each band in this lane. You can also carry on tiny adjustment to light density measurement scope and contrast several gel lanes
- Calculate migration rate of each band, electrophoretic distances for the molecular weight, the fragments sizes and the RF values(IEF)
- Calculate the volume quantification, the height and the area, You can also compare the volume of one spot to a reference, Cancel or redo all the operations infinitely.



### CIS Capture Software

- Obtain gel image through USB interface/TWAIN interface
- Live view 16bit original image
- Time lapse acquisition
- Control light source and lens through software.

### CIS Array Analysis Software

- Change the row and col of select area as well as set dot diameter size
- Calculate the od value very easily
- Clear all the data and re-select the test area as you want
- Export your analysis results to Excel compatible file or save your analyzed image to any where on your computer
- You can preview the report (including company name and test department, the analyzed image and data) and print up the results.

Model	CHS-29	CHS-32	CHS-34
CCD Size	8.9mm x 6.7mm	11.8mm x 8.9mm	15.2mm x 15.2mm
Pixels	1392x1040, 6.45x6.45um	1600x1200, 7.4x7.4um	2048x2048, 7.4x7.4um
A/D	16bit		
CCD Temperature	-55°C below ambient	-50°C below ambient	-60°C below ambient
Lens	17mm F0.95	25mm F0.95	

### Optional Components

Lens	50mm F1.4, 50mm F0.95, 28-70mm F2.8 zoom lens
Filter Wheel	5 position filter wheel/6 position filter wheel
Filters	530nm, 590nm, 630nm, 670nm
White Light	EPI-Whit LED light, White light panel
UV Transilluminator	Filter size 21cm x 26cm, Wavelength 302nm/254nm/365nm
Fluorescent light source	365nm, 395nm, 460nm, 490nm, 530nm, 630nm
Multi-Wavelength light source	Optical fiber coupled, 300nm-800nm
Sample Tray	Motorized lift sample tray

DNI Series, 10 Liter, 20 Liter, 30 Liter, 50 Liter, 80 Liter, 150 Liter, 300 Liter Incubators



Lab incubators are specially designed for long-term and stable continuous operation. Ideal for gentle incubation of organisms, such as on agar plates, and also for conditioning of heat sensitive media. **Lab Incubators** are ideal for cultures, eggs, microbiology, and other biology samples in hospitals, industries, and laboratories. **PID Temp. Control** provides automatic compensation after load changes, setting changes or door opening for excellent accuracy. **Natural convection** heat distribution combines with the adjustable air vents to provide excellent uniformity.

**Double wall** construction, **fiberglass** insulation provided on 5 sides as well as between inner and outer walls, and **silicon rubber** door sealing reduce heat loss and power drain. **Stainless steel interior** chamber and shelves are corrosion resistant, durable and easy to clean. **Powder coating exterior** is beautiful, durable, and corrosion resistant. Internal transparent door to facilitate product inspection.

**Features:**

- Simple keypad input allows easy temperature setting.
- LED digital display enables users to monitor the chamber temperature at any given time.
- Visual alarm indicator alerts users of abnormal conditions if the chamber temperature exceeds the setting point by 10°C.
- The temperature can be controlled and maintained to 70°C.
- Double doors allow samples viewing from the inner door.
- Shelves can be adjustable.
- The temperature stability is ±0.3°C at 37°C; ±0.4°C at 70°C.
- DNI-10 incubator: a reliable efficient and compact chamber in a sturdy design at a very favorable price. Units are stackable.



DNI-300D

**Specifications:**

Model	DNI-10	DNI-20	DNI-30	DNI-50
<b>Convection</b>	Natural convection			
<b>Temperature Range</b>	Ambient +5°C ~ 70°C			
<b>Volume (Liters)</b>	10	20	30	50
<b>Inside Dimensions (mm)</b>	W282xD200xH190	W300xD310xH230	W325xD310xH315	W380xD365xH390
<b>Heater: Incubator</b>	150W	200W	300W	500W
<b>Outside Dimensions (mm)</b>	W500xD270xH300	W412xD420xH500	W425xD420xH610	W480xD475xH695
<b>Shelves</b>	1 Shelf	2 Shelves		
<b>Power supply</b>	AC220V 50/60Hz (110V 60Hz available)			

Model	DNI-80	DNI-150	DNI-300
<b>Convection</b>	Natural convection		
<b>Temperature Range</b>	Ambient +5°C ~ 70°C		
<b>Volume (Liters)</b>	80	150	300
<b>Inside Dimensions (mm)</b>	W420xD450xH463	W625xD510xH500	W625xD510xH1000
<b>Heater: Incubator</b>	700W	800W	1000W
<b>Outside Dimensions (mm)</b>	W522xD560xH770	W725xD620xH795	W725xD620xH1465
<b>Shelves</b>	2 Shelves		
<b>Power supply</b>	AC220V 50/60Hz (110V 60Hz available)		

### DFI Series, 36 Liter, 80 Liter, 150 Liter, 240 Liter Incubators



#### Microbiological Incubator With Forced Convection

Premium equipment for all gentle incubation applications, including processing large numbers of samples at high throughput. Outstanding dynamics keep the required temperature virtually stable with homogenous distribution, irrespective of how many times the door is opened. The modern range of incubators is available in 4 sizes. DFI Series offers excellent uniformity and stability & are used for many applications as incubation of culture test, drying slides, microbiological incubation, bacteriological test and more. The inner case is constructed from polished stainless steel. Internal glass door for incubator. All units are provided with wire plated shelves with multi position settings. All models are with fans assisted air circulation. The chamber ventilation and exhaust vent are easily adjustable. Wide choice of control options is available. PID controller is fitted as standard with dual display of measured value and setpoint.

#### Options:

- 38mm cable port
- Gas inlet
- 5 programs of 8 segments model: 3216CP
- 4 programs of 16 segments model: 2416P4
- RS-232/485 communication model: 3216E
- Datalogger



DFI-36

Model	DFI-36	DFI-80	DFI-150	DFI-240
Temp. range	Room temperature - 80°C			
Temp. constancy	±0.1°C			
Temp. uniformity	±2% at 37°C			
Temp. control	PID			
Temp. sensor	Thermocouple K			
Heater: Incubator	400W	400W	600W	800W
Inside Material	S.S -430			
Timer	99hr 59min			
Safety devices	Short circuit breaker, over heat protector, sensor abnormality			
Inside dimensions (mm)	W400xD300xH300	W500xD400xH400	W600xD500xH500	W600xD500xH800
Outside dimensions (mm)	W525xD420xH595	W620xD520xH620	W720xD620xH720	W720xD620xH1020
Volume (Liters)	36	80	150	240
Shelves	2	2	2	3
Weight	34kg	47kg	60kg	76kg



**DFI-N Series, 50 Liter, 70 Liter, 140 Liter, 240 Liter Incubators**

Precise incubating, Micro-processor based temperature controller up to  $\pm 0.1^{\circ}\text{C}$ .  
 Silent hot conditioned axial fan and the unique design of air circulation for uniformity up to  $\pm 1.5\%$ .  
 Patented ventilator featured with safe & easy access for exhausting of damp and fume, fast cool-down and ultra-low intrinsic temperature close to ambient.  
 Available with power-on modes of standby and auto restart after power failure for additional reliable and uninterrupted operation.  
 Bright cool white temperature screen, easy access symbolic key icon and status display.  
 Hair-style polished stainless steel interior and rounded corner bottom for easy cleaning and long service life.  
 Adjustable shelves for more space & different heights.

**Applications:**

Applicable fields of medical Is & pharmaceuticals, life science, agriculture, food industries and, electric and electronics



**DFI-240N**

**Specifications:**

Model	DFI-50N	DFI-70N	DFI-140N	DFI-240N
<b>Temp. range</b>	Room temperature 80°C			
<b>Temp. constancy</b>	$\pm 0.1^{\circ}\text{C} \sim 0.3^{\circ}\text{C}$			
<b>Temp. uniformity</b>	$\pm 1.5 \sim 2.0\%$			
<b>Temp. control</b>	PID			
<b>Heater: Oven</b>	240W		375W	500W
<b>Inside Material</b>	SUS-304, hair style polishing			
<b>Timer</b>	Auto start-up, Auto shut-up			
<b>Safety devices</b>	Protection and warning against short-open-circuit temperature sensor High-temperature cutout and low-temperature alarm Independent over temperature cutout (STB), RCD ATC (Absolute Temperature Calibration), Auto start-up or standby after power fail ure			
<b>Inside dimensions (mm)</b>	W400xD400xH320	W440xD400xH400	W550xD550xH460	W640xD610xH610
<b>Outside dimensions (mm)</b>	W510xD550xH698	W550xD550xH778	W660xD705xH858	W750xD765xH1008
<b>Capacity (Liters)</b>	50	70	140	240
<b>Shelves/Maximum</b>	2/3	2/4	2/5	3/7
<b>Power input</b>	220-240V- 50/60Hz, 100V- 50/60Hz, 120V-50/60Hz			
<b>Observation window</b>	Yes			
<b>Insulation material</b>	Rock wool			
<b>Door gasket</b>	Silicone rubber			
<b>Duty cycle</b>	Continuous			
<b>Air convection mode</b>	Forced convection			



GI12-2

### GI-Series, General Purpose

MRC General Purpose Incubators are the ideal solution for industrial protocols, biological research and environmental studies that demand accurate and repeatable results. Their best in class temperature uniformity is usually found only in more expensive, application specific incubators. MRC General Purpose Incubator's wide temperature and size range make them a perfect solution for any lab.

Heated doors and a unique air jacket design achieve precise temperature uniformity. An independent secondary temperature controller offers the added safety and security of over temperature protection.

The GI Series models include a sealed, inner glass door which provides a view into the chamber without compromising samples or the chamber environment. Stainless steel panels and doors reduce contamination, provide durability and allow for easy cleaning.

### Precise Temperature Control – Superior Uniformity:

- Independent Over Temperature Thermostat
- Over Temperature Alarm
- Temperature Uniformity  $\pm 0.35^{\circ}\text{C}$  at  $37^{\circ}\text{C}$
- Temperature Range Ambient  $+8^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

### Applications:

- Hematology Studies
- Microbiological Determinations
- Pharmaceutical Stability Assays
- General Purpose Incubator Applications
- Large Scale Roller Apparatus Applications
- Bacterial Culturing and Research
- Food Processing Quality Control
- Biochemical Studies.



GI2-2



GI11-2



GI6-2

Model	GI2-2	GI6-2	GI7-2	GI11-2	GI12-2
Net Weight (kg)	37	72	74	89	144
Capacity	56 L	163 L	185 L	306 L	163 L each
Control/Displays	Microprocessor/Digital LED				
Exterior DIM.(cm)	55.9Wx55.9Dx66.1H	64.8Wx69.3Dx96.6H	76.2Wx80.7Dx82H	108Wx68.6Dx96.6H	64.8Wx69.3Dx192.5H
Chamber DIM.(cm)	38.1Wx38.1Dx38.1H	48.9Wx50.8Dx65.4H	60.3Wx60.9Dx50.2H	92Wx50.8Dx65.4H	48.9Wx50.8Dx65.4H
Interior Outlet	One			One each	
Temperature Range	$5^{\circ}$ above amb. to $70^{\circ}\text{C}$				
Temp. Uniformity	$\pm 0.35^{\circ}\text{C}$ at $37^{\circ}\text{C}$				
Chamber Style	Single			Single-2 doors	Dual-over/under
Tempered Safety Glass Door	Yes				
Access Port	Yes				
Over Temp. Safety	Independent Overtemp Protection				
Electrical Specifications Phase-120V Phase-220V	450W / 4.5A / 50/60Hz 500W / 2.5A / 50/60Hz	700W / 4.5A / 50/60Hz 725W / 2.5A / 50/60Hz	650W / 4.5A / 50/60Hz 700W / 2.5A / 50/60Hz	850W / 5.9A / 50/60Hz 3840W / 16A / 50/60Hz	Each chamber 650W / 5.0A / 50/60Hz 725W / 2.5A / 50/60Hz
Shelving	6	12	9	12	12 each



PIN200

**PIN-Series, incubators**

The incubators are of the same basic construction as the ovens & have a maximum operating temperature of 80°C. Minimum operating temperature 10°C above ambient.

Both gravity convection & fan assisted versions are available. All units have an integral sealed glass door to



PIN30

facilitate product inspection and are designed for long term accuracy and reliability. As with all products in the Peak range, a wide choice of control and programming options and other optional features is available. The 400 & 800 Liter capacities are floor standing models. Heat up times are excellent and temperature stability with microprocessor three term control varies from  $\pm 0.2^{\circ}\text{C}$  to  $\pm 0.5^{\circ}\text{C}$ , depending on the model type.

		Incubators Without Fans				Incubators With Fans					
Model		PIN30	PIN60	PIN120	PIN200	PIF30	PIF60	PIF120	PIF200	PIF400	PIF800
Max Temp (°C)		80	80	80	80	80	80	80	80	80	80
Chamber Dimensions (mm)	H	255	350	450	700	300	400	500	750	1500	1500
	W	330	392	492	592	292	392	492	592	605	1200
	D	320	420	520	520	320	420	520	520	510	510
External Dimensions	H	470	570	670	920	470	570	670	920	1970	1720
	W	655	765	865	965	665	765	865	965	980	1585
	D	470	570	670	670	470	570	670	670	720	1000
Chamber Capacity (Liters)		27	58	115	215	28	66	128	230	400	800
Weight (Kg)		30	45	60	75	30	45	60	75	200	280
Shelves (number supplied) (max. possible) (max dist load/shelf kg) (max load kg)		2 3 10 20	2 5 10 30	2 9 10 40	2 15 10 50	2 3 10 20	2 5 10 30	2 9 10 40	2 15 10 50	3 30 10 75	3 30 10 100
<b>PERFORMANCE</b>											
Power Rating at 240V (watts)		250	550	675	1000	250	675	675	1000	2000	4000
Holding Power * at max. temp (watts)		70	95	140	250	115	150	200	300	530	840
Temperature Uniformity * (at max temp as a %)		$\pm 3.5$	$\pm 3.5$	$\pm 3.5$	$\pm 3.5$	$\pm 1.5$	$\pm 1.5$	$\pm 1.5$	$\pm 1.5$	$\pm 2.0$	$\pm 2.0$
Temperature Stability on/off control (°C)		$\pm 2.0$	$\pm 2.0$	$\pm 2.0$	$\pm 2.0$	$\pm 1.0$	$\pm 1.0$	$\pm 1.0$	$\pm 1.0$	$\pm 1.0$	$\pm 1.0$
Temperature Stability PID control (°C)		$\pm 0.5$	$\pm 0.5$	$\pm 0.5$	$\pm 0.5$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$
Heat Up Times * (mins)	37°C	6.5	6.5	6.5	8	2.5	3	3	4	15	17
	60°C	12.5	12.5	12.5	16	8.5	7	8.5	12	40	45
	80°C	18	8	8	25	16.5	12	15.5	23	85	100
Recovery Times * (mins)	37°C	0.5	1	2	2.5	1	0.5	1	1.5	10	12
	60°C	1	2.5	3.5	4	2	1	1.5	3	12	15
	80°C	1.5	3	4.5	6	3.5	1.5	2.5	5	25	30
Door Open 60secs 240V											
Air Exchanges vol (l/h)		N/A	N/A	N/A	N/A	1400	1400	1400	1400	12000	12000
Air Exchanges Exchanges/Hour		N/A	N/A	N/A	N/A	50	21	11	6	30	15

Note: A uniformity of  $\pm 1\%$  =  $\pm 1^{\circ}\text{C}$  at  $100^{\circ}\text{C}$ .  
\* With vents closed



**BOD-250A**

### BOD-80A/BOD-150A/BOD-250A, Cooling

#### Features:

- Supplied with high quality cold rolling plate, sprayed with Dupont powder.
- The inner chamber is made of stainless still SUS304.  
The incubators are insulated using German Bayer CFC-free Polyurethane one-time foaming technology.
- Also provided are independent temperature controller and creepage protector to insure maximum safety.
- The unique air duct structure and configuration can guarantee even temperature throughout the chamber and accurate heating/cooling rate as well as full air circulation inside the chamber.
- RS232 Communication interface is provided.  
One 45 mm test tube with mold protection is located at either the left or right side of the incubator.
- Provided with advanced fuzzy PID programmable temperature controller system.
- Intelligent programmable mode, over temperature protection, creepage protection, door open alarm, current failure alarm and sensor alarm.



Model	BOD-80A	BOD-150A	BOD-250A
Control method	Fuzzy PID type controller		
Range of temperature control	-10°C ~ 65°C (optional -40°C ~ 65°C)		
Temperature display accuracy	0.1°C		
Precision temperature control	± 0.1°C (45°C)		
Temperature evenness	± 0.1°C (45°C)		
Working room temperature	5 ~ 35°C		
Overall dimension (mm)	W525xD607xH1100	W625xD657xH1270	W705xD747xH1500
Inner dimensions (mm)	W400xD400xH500	W500xD450xH670	W580xD540xH800
Product weight	About 87.5KG	About 95.5KG	About 117KG
Effective volume	80L	150L	250L
Temperature control method	Fuzzy logic PID control method		
Defrost method	Force/manual (optional)		
Power supply voltage	AC-220V 50/60HZ		
Programed control	Normal mode/program mode		
Refrigerating power	123W	175W	222W
Heating power	550W	750W	1000W
Test hole	Left right double test hole		
Tray (standard)	Two-layers	Three-layers	Three-layers

- Performance parameter testing under no-load conditions: ambient temperature 20°C, humidity 50%RH.





BOD-250A



**Air duct structure**

It applies circular airflow design concept and forced convection simulated air circulation principle. The large power air circulating blades design can produce higher air flow rate and guarantee high, even and stable inner chamber temp.



**Test hole**

One test hole with the diameter of 45mm made with special mould is arranged on the left & right of the incubator respectively for observation. Internal silica gel soft plugs are provided to make sure the temperature inside the incubator is not effected.



**RS232 interface**

It is a special interface for PC.



LI20P-2

**LI6P-2, LI20P-2, Incubators Peltier Cooled LIP Series**

Innovative peltier cooling technology, eliminates the need for a refrigeration compressor in the LI6P-2 & LI20P-2. These units use 78% less power than alternative models and reduce room air conditioning loads by 75%. They also include 75 pound capacity shelves, which eliminates sagging. These incubators meet APHA specifications for Biochemical Oxygen Demand (B.O.D.) & include a mechanical convection system to ensure even air distribution, digital temperature set controller, over temperature limit control, and a digital temperature display.



LI6P-2

**Features:**

- Independent Over Temperature Thermostat.
- Over Temperature Alarm.
- Temperature Uniformity  $\pm 0.5^{\circ}\text{C}$  at  $20^{\circ}\text{C}$ .
- Temperature Range  $15^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  at  $20^{\circ}\text{C}$  Ambient.

Model	LI6P-2	LI20P-2
<b>Exterior Dimensions (wxdxh)</b>	762x801x851mm	762x801x1766mm
<b>Chamber Dimensions (wxdxh)</b>	647x609x469mm	647x609x1384mm
<b>Incubator Chamber Capacity</b>	185L	546L
<b>Power</b>	230V, 50/60Hz	230V, 50/60Hz
<b>Bottle Capacity</b>	120	300
<b>Number of Shelves</b>	2 included	5 included



- Automatic high and low temperature alarm to prevent the temperature from going too high and dropping too low
- Built-in circulating fan for temperature stability
- Humidity System, illumination and Timer can be install if required
- The compressor will be delayed to start working if power cut & with timer for defrost.  
Using environmental protection cold-media R134a
- Internal Power socket
- Touch-screen panel.

### BOD-80/175-Dual/400, Orbital Shaking, BenchTop

#### The MRC model BOD-80/150/175x2

cooled incubator designed to obtain freezing, incubating, drying & test temperatures between 0°C and +70°C (or -10°C and +60°C). It has stainless steel chamber and two doors, when the outer metallic door is opened there is inner glass door. Very good uniformity is achieved by forced air circulation. A PID temperature controller provides constant and accurate temperature. Inside power socket enable the use of the shaker rotator or other instrument inside. Cable port with cup is available upon request.

#### The MRC model BOD-400/550/590

is ideal for BIOCHEMICAL OXYGEN DEMAND of sewage and waste water. Other applications includes fermentation studies, drug stability tests. Excellent temperature uniformity is obtained by forced air circulation. A PID microprocessor temperature controller provide accurate and constant temperature. Dual display of setpoint and chamber temperature. Hermetically sealed compressor and automatic defrost.

**Options:** 38mm cable port • Gas inlet • Day/Night Light+Timer

Model	BOD-590	BOD-550	BOD-400	BOD-150	BOD-175 Dual	BOD-80
Temp. range	0°C~70°C (or -10°C to 60°C)					
Temp. Accuracy	±0.1°C					
Temp. control	PID					
Temp. Display	LED digital display actual and setting temperature					
Temp. Sensor	PT-100Ω					
Heater	900W	1200W	1200W	900W	900W x 2	900W
Volume	590L	550L	400L	150L	175L x 2	80L
Shelf (Adjustable)	4	4	4	2	2	2
Inside Material	Strengthen white porcelain	SUS 304				
Refrigerator	1/3HP			1/4HP		
Inside dimensions WxDxH(mm)	680x600x1450	680x580x1400	600x500x1350	600x500x500	700x500x500	500x400x400
Outside dimensions WxDxH(mm)	815x800x1940	760x820x1860	670x740x1820	680x700x825	780x690x1720	560x550x670
Weight	90Kg	90Kg	90Kg	78Kg	150Kg	50Kg

**LI5-2, LI20-2, LI27-2, Incubators Refrigerated LI Series**

MRC Refrigerated Incubators (often called B.O.D. Incubators or Low Temp. Incubators) are commonly used for applications such as B.O.D. Determinations, Plant & Insect Studies, Fermentation Studies, and Bacterial Culturing. The MRC Low Temperature Incubators have a temperature range of 20°C degrees below ambient to 45°C. Units are equipped with a hermetically-sealed compressor, a circuit breaker to protect from electrical overload, and an easy to clean, fully insulated chamber. Gentle, continuous forced-air circulation ensures temperature uniformity and reproducible test conditions.

The Refrigerated Incubators also include an independent over temperature safety controller, adjustable shelves in two inch increments and a one amp interior outlet to allow the use of shakers, stirrers, roller bottles or other apparatus.



LI20-2



LI27-2



LI5-2

**Applications:**

- APHA Method at 20°C.
- Plant Cell Growth.
- Fermentation Studies.
- Bacterial Culturing.
- Mycology Studies.
- Independent Over Temperature Thermostat.
- Over Temperature Alarm.
- Temperature Uniformity +/- 0.5°C at 20°C.
- Temperature Range 0°C to 45°C at 20°C Ambient.

Model	LI5-2	LI20-2	LI27-2
<b>Exterior Dimensions (wxdxh)</b>	61.0 x 53.4 x 85.8 cm	87.7 x 87.7 x 196.9 cm	92.8 x 90.9 x 196.9 cm
<b>Chamber Dimensions (wxdxh)</b>	40.6 x 30.4 x 54.6 cm	68.5 x 58.4 x 143.5 cm	76.2 x 67.3 x 137.1 cm
<b>Incubator Chamber Capacity</b>	68L	574L	763L
<b>Power</b>	220V, 50/60Hz	220V, 50/60Hz	220V, 50/60Hz
<b>Bottle Capacity</b>	62	345	540
<b>Number of Shelves</b>	2 included	4 included	6 included



RI40-2

### RI28-2, RI40-2, Reach-In Large Capacity Incubators

This incubator provides extra large capacities while minimizing the amount of floor space needed. The temp. in this large space is kept uniform by integrating a highly responsive microprocessor with an appropriately sized heating element. An independent secondary temp. controller offers the added security of over temperature protection.

Our unique forced air circulation system creates a one-pass circulation pattern that provides both exceptional temp. uniformity & rapid heat recovery. The chamber floors are ruggedly reinforced to support roller apparatus or shakers.

The RI28 & RI40 supplied with six sturdy shelves that will not sag or bend under heavy loads.

#### Applications:

- Hematology Studies.
- Microbiological Determinations.
- Pharmaceutical Stability Assays.
- General Purpose Incubator Applications.
- Large Scale Roller Apparatus Applications.
- Bacterial Culturing and Research.
- Food Processing Quality Control.
- Biochemical Studies.



#### Forced Airflow

The MRC air jacket design and heated outer door allows for uniform heat throughout our incubators.

The General Purpose Incubator Family ranges in size from 2 to 38 cu.ft. ( RI40 - 2 to 38.6 cu.ft. ) This this superior line of incubators has created a level of comfort & convenience for professionals that is unrivaled.

#### Features include:

- Microprocessor Control.
- Viewing Window.
- Roller Bottle Apparatus Accommodation.
- Interior Outlet.
- Powder Coated White Interior.
- Six Shelves.

Model	RI28-2	RI40-2
<b>Capacity</b>	872 L	1092 L
<b>Interior Dimensions</b>	81.9W x 66D x 161.2H cm	97.8W x 86.4D x 191.2H cm
<b>Exterior Dimensions</b>	88.9W x 66D x 186H cm	105.4W x 88.3D x 222.3H cm
<b>Temperature Range</b>	Ambient +8 to 70°C	Ambient +8 to 70°C
<b>Temp. Uniformity</b>	±0.8°C at 37°C	±0.8°C at 37°C
<b>Electrical Specifications</b>	Volts: 120V Hertz: 50/60Hz Watts: 1485W Amps: 8.5A	Volts: 120V Hertz: 50/60Hz Watts: 1650W Amps: 12.5A
<b>Shelving</b>	6 Supplied (16 max)	6 Supplied (20 max)
<b>Access Port</b>	One	One
<b>Interior Outlet</b>	Four	Four
<b>Net Weight (kg)</b>	226	386



HC6-2

**HC6-2, HC9-2, HC30-2, Standard Humidity Cabinets  
HC9R-2, HC30R-2, Refrigerated Humidity Cabinets**

MRC Humidity Test Cabinets provide a controlled environment for a wide range of industrial & biotechnology testing applications. This line is designed to duplicate a natural condition, which allows testing the limitations of a sample when exposed to various temperature & moisture fluctuations.

Microprocessor controls maintain temperature and humidity in approximate ranges of 35-70°C (HC30R-2 10-70°C) and 40-95%RH, respectively. An extra large water jacket minimizes condensation inside the chamber and supports optimum uniformity conditions.

A low-pressure water vapor generator, injecting saturated water vapor into the recirculating air duct, controls chamber humidification. This process is preferable to steam generation because steam introduces additional heat to the chamber atmosphere, which then compromises temperature control. Uniform temperature and humidity are maintained using the same horizontal air flow technology employed in the MRC oven family.

**Applications include:**

- Shelf Life Testing.
- MIL-SPEC Packaging.
- Component Burn In.
- Vapor Transmission.
- Stability Testing.
- Fingerprint Detection.

MRC Humidity Test Chambers provide a controlled environment for a wide range of industrial and bio technical testing applications. All chambers include:

- Microprocessor Control.
- Seamless Corrosion-Resistant Stainless Steel Interior.
- High Limit Back-Up Controller.

Models HC9R-2/HC30R-2, These humidity test chambers incorporate a refrigeration system that dramatically increases the operational range of the cabinet.



HC9-2



HC9R-2



HC30R-2

Model	HC6-2	HC9-2	HC9R-2	HC30-2	HC30R-2
<b>Capacity</b>	141 L	309 L	309 L	799 L	799 L
<b>Interior DIM. WxDxH cm</b>	60.5x40.75x61	76.2x53.3x76.2	76.2x53.3x76.2	76.8x66x157.4	76.8x66x157.4
<b>Exterior DIM. WxDxH cm</b>	74x66x94	112.4x83.2x144.8	112.4x83.2x144.8	108x94x215.9	108x94x215.9
<b>Temp. Range</b>	Ambient +10°C to 80°C	Ambient +10°C to 70°C	+10°C to 70°C	Ambient +10°C to 70°C	+10°C to 70°C
<b>Temp. Uniformity</b>	±0.5°C at 37°C	±0.5°C at 37°C	±0.5°C at 37°C	±0.5°C at 37°C	±0.5°C at 37°C
<b>Electrical Specifications</b>	220 Volts				
<b>Temp. Control</b>	± 0.5°C				
<b>Jacket Type</b>	Air	Air	Air	Air	Air
<b>Relative Humidity Range</b>	Ambient +10% to -95%				
<b>Shelving</b>	2 supplied (5 max)	3 Supplied (8 max)	3 Supplied (8 max)	6 Supplied (16 max)	6 Supplied (16 max)



HD-800

**Features:**

- Requires less probe to produce consistent films with sharp bands.
- Forced air convection provides excellent temperature uniformity.
- Compact design saves bench space.
- Broad temperature range from ambient +5°C to 80°C.
- Precise microprocessor-based PID temperature control from 5°C above ambient to 70°C in 0.1°C increments.
- Forced air circulation maintains temperature uniformity of ±0.5°C.
- Variable speed models provide consistent speed even at low rpms for uniform distribution of solutions and complete wetting of membrane.

**HD-800 Series, Hybridization Incubator**

The MRC hybridization incubators offers high performance with precise temperature control, safety and convenience. It is small and space saving incubator.

The bottle carousel is easily removable for easy cleaning of the chamber. The bottle carousel accept up to eight bottles (300mm). Very homogeneous temperature distribution in the chamber is obtained by air forced ventilation. This airflow system also ensures fast recovery of chamber temperature after door opening. A PID temperature controller provide constant & no temperature overshoot. Dual display of actual chamber temperature & set point temp.

Tempered glass viewing window provides clear chamber visibility without opening the door. Simple operation of speed by means of rotary switch & the speed display is by analog tachometer.

**Applications:**

- Northern (RNA) blot hybridizations
- Southern (DNA) blot hybridizations
- Western (Protein) blot hybridizations.



HD-801



HD-AC-H

HD-AC-1.5

HD-AC-15

HD-AC-50

AC-210-96

Model	HD-800D	HD-801RD	HD-801DS	HD-801RK
Shaking	Rotation+orbital	Rotation	orbital	Rocking
Temp. range	Ambient +5°C~80°C			
Temp. Accuracy	±0.1°C			
Temp. control	PID			
Temp. Display	LED			
Rotor Speed	6 ~ 50rpm		-	-
Rotor Capacity	8 pcs (Max)	Supplied 8 pcs (Max)	-	-
Shaker Speed	10 ~ 100rpm	-	20 ~ 200rpm	6 ~ 60rpm
Shaking Width	25mm	-	-	-
Shaker Capacity	Carry 6 kg			
Timer	999 h / 999 min / 999 sec			
Shaking Plate (mm)	310 x 210			
Inside dimensions WxDxH(mm)	350x250x425		350x255x250	
Outside dimensions WxDxH(mm)	440x375x660		440x375x410	
Weight	33kg		23kg	



1013-2

**1013-2, Hybridization Incubator**

Hybridization ovens are the preferred technique for hybridization in today's laboratory. Incubation takes place inside the incubator, under constant rotation, ensuring even distribution of probe solution over the membrane. While there are other solutions available for hybridization applications, hybridization ovens offer better agitation and higher throughput. They also require less volume per membrane area, resulting in savings for labs.

MRC 1013-2 Hybridization incubator's unique fan assisted airflow system circulates air evenly and continuously, delivering excellent temperature uniformity throughout the oven chamber. This system ensures fast recovery of chamber temperature after a door opening.

The digital set/digital read microprocessor temperature controller maximizes rapid heat-up of the oven. An over temperature safety control is automatically set by the microprocessor at 1.0°C above the setpoint. In the unlikely event of a microprocessor failure, a thermal cutoff will shut off the power to the heating elements.

The 2-20 RPM rotation speed range permits hybridization and washing at different speeds at the touch of a dial. A separate jogging switch has been included to allow incremental rotation of the carousel for easy loading & unloading. This unit has a 12 bottle capacity and is supplied with a drip pan with adjustable feet, a locking pin, & a power cord.

<b>Model</b>	1013-2
<b>Exterior Dimensions (mm)</b>	445Wx508Dx553H
<b>Chamber Dimensions (mm)</b>	317Wx304Dx368H
<b>Rotator Capacity</b>	12 Bottles

**Applications:**

- Molecular Biology Assays.
- Southern (DNA) Hybridization.
- Northern (RNA) Hybridization.
- Western Blot.
- Temperature Range Ambient +5°C to 70°C.
- Temperature Adjustable by 0.1°C.



3025-2

**3015-2, 3025-2, Water Jacket Value Line Incubators**

Water Jacket Incubators provide excellent temperature uniformity. Both the water jacket and the heated door design eliminate condensation on the walls & glass door. Copper strip in the water jacket inhibits bacteria growth.

The microprocessor temperature control allows digital temperature set and read-out to 0.1°C. Incubators are available as a single chamber unit or over/under unit and feature a full length inner glass door for visual checks without disturbing incubation. Through-wall access port allows roller apparatus, rocker or stirrer operation. Adjustable leveling feet compensate for uneven surfaces. All 3000 Series Incubators are supplied with a humidity pan.

**Applications include:**

- Biochemical Studies.
- Hematologic Studies.
- Bacterial Culturing and Research.
- Microbiological Determinations.
- Pharmaceutical Stability Assays.
- Food Processing Quality Control.
- Large Scale Roller Apparatus Applications.



3015-2

Model	3015-2	3025-2
<b>Weight (kg)</b>	143	286
<b>Capacity</b>	155 L	311 L
<b>Interior Dimensions</b>	46.9W x 46.9D x 62.2H cm	46.9W x 46.9D x 62.2H cm
<b>Exterior Dimensions</b>	58.4W x 59.7D x 97.8H cm	58.42W x 59.7D x 195.6H cm
<b>Temperature Range</b>	Ambient +5 to 70°C	Ambient +5 to 70°C
<b>Temp. Uniformity</b>	+0.2°C	+0.2°C
<b>Electrical Specifications</b>	Volts: 220V Hertz: 50/60Hz Watts: 650W	
<b>Shelving</b>	3 Supplied	3 Supplied per unit



LIFLY-2

**LIFLY-2/LIFLY-VIEW-2, Drosophila Incubators LIFLY Series**

The MRC LIFLY is the first Drosophila specific low temperature incubator that takes advantage of the range of temperatures acceptable in Drosophila culture allowing the condensing coil adequate cycling time, thus avoiding ice buildup. The LIFLY addresses all of the major performance issues associated with other fly-specific incubators on the market.

This incubator functions within the range of temperature preferred by fruit flies. The elements only activate if the chamber temperature goes below the programmed lowest acceptable level. The compressor will shut off & rest while the chamber temperature slowly rises in response to a door opening or heat from fan or optional light. This results in a longer lasting unit with less maintenance, reduced heat output & less noise from the compressor.



LIFLY-VIEW-2

**Applications:**

- Microprocessor controlled interior light mimics diurnal cycles that foster breeding.
- Conformal coated refrigeration coils.
- Robust, programmable heating and cooling control.



**Energy Saving Features:**

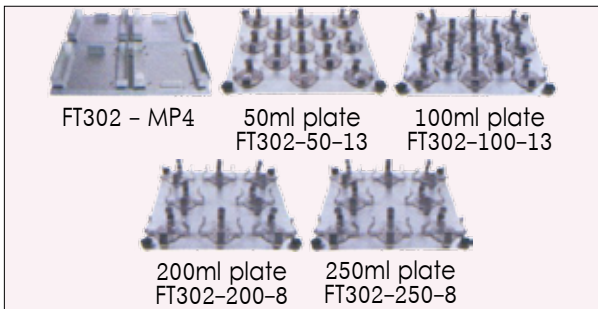
- On and off condenser cycles prevent ice build-up.
- No costly coil replacements from pitting caused by crystallized gas contact with ice.
- Compressor cycling requires less than 25% of the energy required for standard B.O.D. incubators.

Model	LIFLY-2	LIFLY-VIEW-2
Exterior Dimensions (wxdxh)	87.7 x 87.7 x 196.9 cm	87.7 x 87.7 x 196.9 cm
Chamber Dimensions (wxdxh)	68.5 x 58.4 x 143.5 cm	68.5 x 58.4 x 143.5 cm
Incubator Chamber Capacity	574L	574L
Interior Outlet	220V	220V
Number of Shelves	8 included	8 included





**TOU-H/C30**

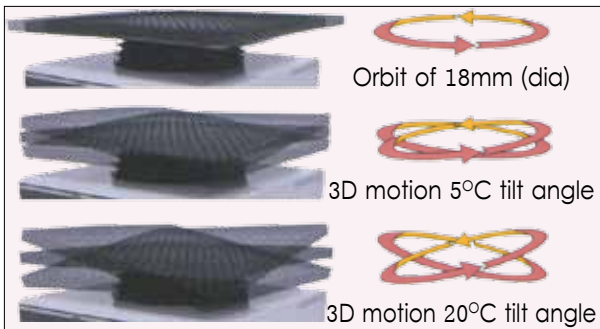


FT302 - MP4      50ml plate FT302-50-13      100ml plate FT302-100-13  
 200ml plate FT302-200-8      250ml plate FT302-250-8

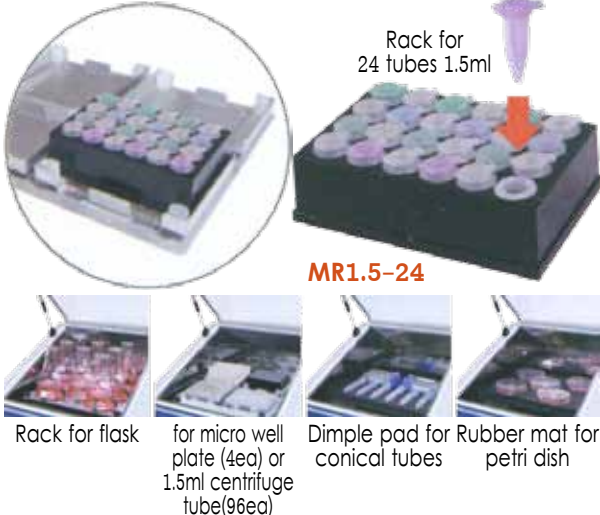
**Other Accessories:**

Model	Description
FT302-MP4	Rack for micro well plate - Capacity: 4ea
FT302-50-13	Flask Rack for 50ml flask - Capacity: 13ea
FT302-100-13	Flask Rack for 100ml flask-Capacity: 13ea
FT302-250-8	Flask Rack for 250ml flask - Capacity: 8ea

**View of actual movements:**



**Accessories:**



Rack for 24 tubes 1.5ml

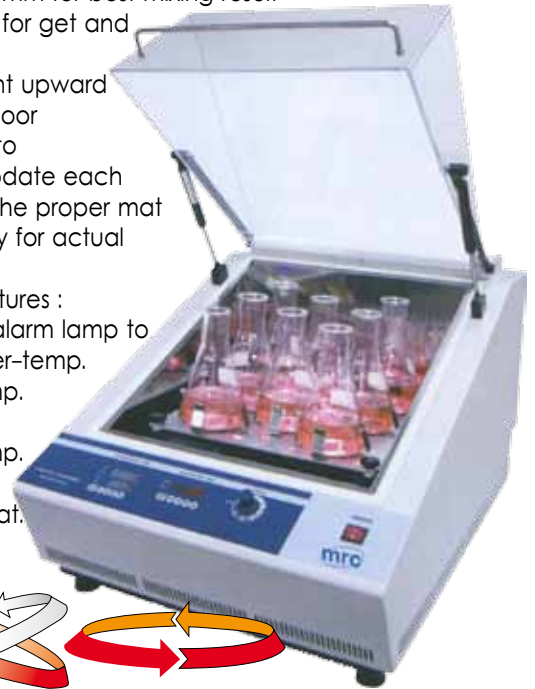
**MR1.5-24**

Rack for flask for micro well plate (4ea) or 1.5ml centrifuge tube(96ea)      Dimple pad for Rubber mat for conical tubes      petri dish

**TOU-H30/C30, Shaking Incubator, Variable plate for heating & shaking Incubator**

**TOU-H30: for heating, TOU-C30: heating and cooling**

- The internal mechanism and chamber are separated, therefore, there is no loss of heat.
- TOU-H/C MECHANISM (patented, 5step angle adjustment system) allows orbital motion & various twist for movement
- Digital micro processor control [PID] for highest accuracy
- Select between heating & cooling mode or heating mode
- Orbit of 18mm for best mixing result especially for get and blotting
- Convenient upward opening door
- Dual mat to accommodate each vessels in the proper mat
- LED display for actual speed
- Safety features :  
 -Flashing alarm lamp to warn over-temp.  
 -Over-temp. cut-out  
 -Over-temp. safety thermostat.



Model	TOU-H30	TOU-C30
<b>Speed Range</b>	30-300rpm	
<b>Shaking Angle</b>	orbital range-18mm 3D twist 5°C 3D twist 10°C 3D twist 15°C 3D twist 20°C	
<b>Temp. Range</b>	Ambient +5°C~80.0°C	15.0°C~65.0°C
<b>Dimensions</b>	W470xD630xH410 mm	
<b>Weight</b>	34kg	39kg
<b>Wattage</b>	610W	810W
<b>Power</b>	AC 110V/220V/230V, 50/60Hz	

**Shaking Capacities:**

Model	TOU-H30	TOU-C30
<b>1.5ml Tubes</b>	96ea	
<b>Conical Tubes(50ml)</b>	14ea	
<b>Petri dish</b>	9ea	
<b>Micro Well Plate</b>	4ea	
<b>Deep Well Plate</b>	4ea	
<b>Flask 50ml</b>	13ea	
<b>Flask 100ml</b>	13ea	
<b>Flask 250ml</b>	8ea	

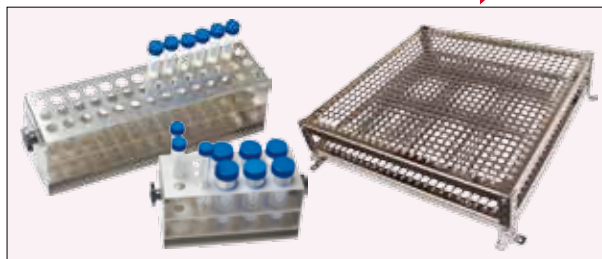
# SHAKER-INCUBATORS Orbital Shaking, BenchTop



**TOU-50N**

- Automatic stop of shaking, when the door is opened
- Accommodate flasks up to 2000ml
- Universal spring rack for various shapes/sizes of flasks is available (optional).

**Optional: Universal spring tray**



## LOM-65/TOU-50N/TOU-120N, Orbital Shaking Incubator, BenchTop

### Applications

- Areas of application: cultivation of cell & tissue cultures or micro organisms. molecular biology, cell and insect culture, and entomology studies.
- Production of secondary natural substances and biogenetic pharmaceuticals etc.

### Features:

- Space saving with transparent window in the front which provide good visibility that minimize the need to open the chamber, automatic cutout of shaker when lid is open to protect operator.
- Platform 300 x 400 mm or 450 x 450mm accept flasks up to 2 Liter, test tubes racks and gel trays.
- Shakers feature a triple eccentric drive that handles heavy workloads, provides uniform agitation & enables continuous 24-hour operation even at high speeds.
- Precisely monitor and control chamber temperature over complete range with  $\pm 0.1^\circ\text{C}$  accuracy at  $37^\circ\text{C}$  with PID temperature controller
- DC motor & variable speed control from 40 to 400rpm, controlled by a rotary dial
- Integrated tachometer monitors & displays speed in rpm to guarantee an accurate setting
- Easy-to-read digital display shows temperature
- Advanced shaking mechanism provides quiet shaking & precise speed control
- Min. noise & no vibration



**TOU-50N**

**LOM-65**

Model	TOU-50N	TOU-120N	LOM-65
Type	Flip-up door		Upright
Temp. range	Ambient + $5^\circ\text{C}$ ~ $70^\circ\text{C}$		
Temp. Accuracy	$\pm 0.1^\circ\text{C}$		
Temp. control	PID		
Temp. Display	LED		
Shaker Speed	20~250 rpm (optional 400 rpm)		
Shaking width	25 mm		
Timer	999h / 999min / 999sec		
Volume	66L	102L	65L
Shaking Plate Size (mm)	400x300	450x450	400x300
Inside dimensions (mm)	W455xD390xH380	W500xD540xH380	W450xD390xH370
Outside dimensions (mm)	W460xD510xH540	W510xD650xH540	W520xD550xH610
Weight (Approx.)	30Kg	40Kg	50Kg

### Capacity of flask holders

Model	111-1-110050	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000
Flask clamps	50ml	125ml	250ml	500ml	1000ml	2000ml
TOU-50N	35	20	12	6	4	2
TOU-120N	64	36	25	16	9	5
LOM-65	35	20	12	6	4	2



**TOUR-120-2**

**TOUR-120-2/5, Orbital BenchTop Refrigerated Shaker-Incubator**

**Applications**

- Areas of application: cultivation of cell & tissue cultures or micro organisms. molecular biology, cell and insect culture, and entomology studies.
- Production of secondary natural substances and biogenetic pharmaceuticals etc.

**Features:**

- Space saving with transparent covers which provide good visibility that minimize the need to open the chamber, automatic cutout of shaker when lid is open to protect operator.
- Platform 460 x 460mm accept flasks up to 2 Liter, test tubes racks and gel trays.
- Shakers feature a triple eccentric drive that handles heavy workloads, provides uniform agitation & enables continuous 24-hour operation even at high speeds.
- Programmable controls - automatic changes temperature & speed in timed intervals
- Constant speed & temperature mode
- Advanced shaking mechanism provides quiet shaking & precise speed control
- Min. noise & no vibration
- Automatic stop of shaking, when the door is opened
- Accommodate flasks up to 2000ml
- Universal spring rack for various shapes/sizes of flasks is available (optional).



**Product parameters:**

Model	TOUR-120-5	TOUR-120-2
Control	Fuzzy PID controller	
Shaker Speed	25~300RPM ±1 RPM	25~400RPM ±1 RPM
Shaking System	Orbital	
Shaking Orbit	25mm	
Timing Range (additional)	Auto start-up; auto shutdown; power off memory; power on resume; valuing temperature and speed control; programmed temperature and speed control (0~99h)	
Temperature Precision	± 0.1 (0~999h)	
Temperature Control Range	4°C~60°C	
Temperature Uniformity	±1°C	
Shaking Plate Size (mm)	460mm x 460mm	
Inside Dimensions (mm)	(W x L x H) 520mm x 550mm x 450mm	
Outside Dimensions (mm)	(W x L x H) 620mm x 840mm x 630mm	
Power Capacity	220V 50/60Hz 800VA	

- Performance parameters under ideal conditions: ambient temperature 20°C, ambient humidity 50%RH

**Capacity of flask holders**

Model	111-1-110050	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000
Flask clamps	50ml	125ml	250ml	500ml	1000ml	2000ml
Number of Holders	64	36	25	16	9	5

# SHAKER-INCUBATORS Orbital Refrigerated



**LOM-150**



**Optional: Tube Holders**



**FLASK HOLDERS**



**Universal platform for LOM-150**

111-1-111143

## **LOM-150-Series, 150Liter Shaking Incubator, Orbital Motion**

This multipurpose model can shake, incubate & refrigerate. The 480x380mm platform accepts flasks up to 6 Liter. Large viewing window & internal light provide clear chamber visibility, with moveable window blind.

One stationary shelf for incubating added samples with a front opening door, the LOM-570 can be used on the bench or on the floor, wide temp. range 0°C to 60°C.

Model LOM-150D: two stage shaker enable to shake two platform simultaneously.

Useful for biological culture under various temperature.

- Useful for biological culture under various temp.
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost.
- With safety switch to stop shaking when opening door
- Three-point bearing transmission is adopted suitable for heavy loads and continuous duty.
- Minimum noise, no vibration.
- Refrigeration using non cfc gas R134A
- Optional day/night light with timer.
- Transparent glass observation window & internal light.
- Provide clear visibility without opening the door.
- Uses brush less AC motor for long durability and stable performance of the shaking system.
- Overheat and over low protector, built-in circulating fan for temperature stability.
- Optional: Day/night light+timer.



**Double Platform, LOM-150D**

Model	LOM-150	LOM-150D
System	Forced air circulation	
Shaking system	Orbital	
Shaking platform	Single	Double
Temp. range	0°C~70°C	
Temp. constancy	±0.1°C	
Temp. uniformity	±1°C (at 37)	
Temp. control/display	PID/LED	
Temp. sensor	PT-100Ω	
Inside material	SUS-304	
Rate of shaking	20~300 rpm (option 400 rpm)	20~150 rpm
Shaking width	25 mm	
Shaking plate	W480xD380	W480xD380 Double platform
Refrigerator	1/4 HP	
Heater: Incubator	900W	
Safety devices	Short circuit breaker, over heat protector, refrigerator over load protector, sensor abnormality, over low protector	
Inside dimensions (mm)	W600xD500xH500	
Outside dimensions (mm)	W680xD690xH860	
Volume (Liter)	150	
Shelves	1 (Adjustable)	N/A
Power supply	110/220V, (8.5A)	
Weight	98Kg	100Kg

### Capacity for flasks holders:

Model	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000
Flask clamps	125ml	250ml	500ml	1000ml	2000ml	3liter	4liter	5liter
LOM-150	30	20	12	6	5	4	2	1
LOM-150D	30x2 set	20x2 set	12x2 set	-	-	-	-	-



## LOM-175-Dual/LOM-175D-Dual, Orbital Dual Shaking Incubator

### Features:

- Useful for biological culture under various temp.
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost.
- With safety switch to stop shaking when opening door
- Three-point bearing transmission is adopted suitable for heavy loads and continuous duty.
- Minimum noise, no vibration.
- Refrigeration using non cfc gas R134A
- Optional day/night light with timer.
- Transparent glass observation window & internal light.
- Provide clear visibility without opening the door.
- Uses brush less AC motor for long durability and stable performance of the shaking system.
- Overheat and over low protector, built-in circulating fan for temperature stability.



Model	LOM-175-Dual	LOM-175D-Dual
Platform	Single	Double
Temp. range	0°C~70°C	
Temp. Accuracy	±0.1°C	
Temp. control	PID	
Temp. Display	LED 2-screen digital display actual and setting temperature	
Shaker Speed	20~250 rpm (option 400 rpm)	20~150 rpm
Shaking width	25 mm	
Timer	999h / 999min / 999sec	
Heater	900 W each chamber	
Refrigerator	1/4HP	
Volume	Each chamber 175L	
Shaking Plate Size (mm)	640x440	
Inside dimensions (mm)	W700xD500xH500	
Outside dimensions (mm)	W780xD690xH1720	
Shelf (Adjustable)	1	N/A
Weight (Approx.)	170Kg	180Kg

### Capacity of flask holders

Model	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000
Flask clamps	125ml	250ml	500ml	1000ml	2000ml	3Liter	4Liter	5Liter
LOM-175-Dual	40	28	20	12	6	6	2	2
LOM-175D-Dual	40x4 set	28x4 set	20x4 set	-	-	-	-	-

## SHAKER-INCUBATORS Orbital Shaking, Large Horizontal



### LOM-300, Orbital Shaking Incubator, Double Door

#### Features:

- Useful for biological culture under various temp.
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost.
- With safety switch to stop shaking when opening door
- Three-point bearing transmission is adopted suitable for heavy loads and continuous duty.
- Minimum noise, no vibration.
- Refrigeration using non cfc gas R134A
- Optional day/night light with timer.
- Transparent glass observation window & internal light.
- Provide clear visibility without opening the door.
- Uses brush less AC motor for long durability and stable performance of the shaking system.
- Overheat and over low protector, built-in circulating fan for temperature stability.

#### Optional: Tube Holders



#### Optional: Universal spring tray for LOM-300



#### FLASK HOLDERS

Model	LOM-300
Temp. range	0°C~70°C
Temp. Accuracy	±0.1°C
Temp. control	PID
Temp. Display	LED
Shaker Speed	20~250 rpm (option 400 rpm)
Shaking width	50 mm
Timer	999h / 999min / 999sec
Illumination	Fluorescent lamp 20 W
Heater	1200 W
Refrigerator	1/3HP
Volume	300L
Shaking Plate Size (mm)	900x500
Inside dimensions (mm)	W1000xD600xH500
Outside dimensions (mm)	W1380xD690xH890
Shelf (Adjustable)	1
Weight (Approx.)	280Kg

#### Capacity of flask holders

Model	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000
Flask clamps	125ml	250ml	500ml	1000ml	2000ml	3Liter	4Liter	5Liter
LOM-300	66	50	32	18	10	10	3	3



**LOM2-8043**

**Descriptions:**

MRC now can offer new space-saving incubator shakers. This LOM – Series shaker (touch screen) can be stacked up to three units high, providing laboratory professionals tripled culture capacity, while still only occupying the same “footprint” of a single shaker. All models feature an insulated, fold-down door with double-layer glass window for high visibility. On all refrigerating models, microprocessor controller provides unmatched versatility by enable users to create personalized program (with up to 9 segments, with cycling) to automate changes to function parameters.

**LOM1-8043, LOM2-8043, LOM3-8043, Premium Stackable Shaking Incubators**

**Features:**

- 5.6'' LCD 640x480 touch screen panel clearly indicates all parameters in one page display.
- Fold-down door with door handle, and dedicated sliding shaking platform provide convenient access to your experiment products. Moreover, the top of the casing can be further used as a work area for locating small items of lab equipment etc.
- The incubator casing is made of heavy-gauge cold-rolled steel; together with high graded #304 stainless steel inner chambers with cover corners make it easy to clean with mild detergent.
- The unit can be upgraded with CO2 and humidity control, with heated window glass to prevent condensation, perfect for cell culture.
- Heavy-duty, eccentric drive mechanism allows extended speed ranges from 30 to 300 rpm, ±1 rpm with minimized vibration, even when shakers are stacked of three high.
- Robust brushless AC motor enables and smooth quiet shaking motion, even when unit is operating at top speed with maximum workload.
- Non-volatile memory saves settings during power outage & automatically restarts the unit after power is restored.
- Audible and visual alarms alert user of setpoint deviations. Audible alarm may be muted.
- Heater shuts off when high-temperature limit is exceeded.
- Shaker stops when excess vibration is detected or when door is opened.
- Interior chamber light for clear observation.
- Pre drilled platform as standard configuration, flask clamps excluded.
- Please contact MRC for more information about humidity and CO2 control options.

Model	LOM1-8043	LOM2-8043	LOM3-8043
<b>Control</b>	P.I.D Microprocessor		
<b>Control Mode</b>	Fix Value or Program (up to 9 Segments)		
<b>Control Panel</b>	LCD Touch Screen		
<b>Air Convection</b>	Forced		
<b>Shaking Mode</b>	Orbit		
<b>Volume/ Compartment (L)</b>	190		150
<b>Working Temperature (°C)</b>	10-35		
<b>Shaking speed (rpm)</b>	30-300		
<b>Stroke ( mm)</b>	1-50 Stepless Adjustable		
<b>Temperature Range (°C)</b>	4-60		
<b>Temperature Accuracy (°C)</b>	0.1		
<b>Temperature Uniformity (°C)</b>	±1°C@37°C		
<b>Timer</b>	1 to 9999 mins		
<b>Tray (mm) (WxD)</b>	800x430		
<b>No. Of Tray</b>	1	2	3
<b>Inner Dimensions</b>	920Wx532Dx395H mm		
<b>Exterior Dimensions</b>	1300Wx950Dx900H mm	1300Wx950Dx1310H mm	1300Wx950Dx1890H mm
<b>Packing Dimensions</b>	1420Wx1070Dx1040H mm	1420Wx1070Dx1480H mm	1420Wx1070Dx2060H mm
<b>Net/Gross Weight</b>	200/240 kg	390/440 kg	580/650 kg
<b>Power (W)</b>	1200	2400	3600
<b>Electricity</b>	220/240Volt 50/60 HZ		
<b>Approval</b>	CE, ISO		
<b>Security</b>	Over-temperature Protection, Compressor Overload Protection, Electrical Leakage Protection, CO2 Concentration Deviation Alarm.		
<b>Additional</b>	Built-in Printer, RS-232 interface		

**Glass dimensions may reduce max. capacity:**

Model	50ml	100ml	250ml	500ml	750ml	1000ml	2000ml
<b>LOM1-8043</b>	50	50	32	26	20	14	8
<b>LOM2-8043</b>	100	100	64	52	40	28	16
<b>LOM3-8043</b>	150	150	96	78	60	42	-

# SHAKER-INCUBATORS Orbital Shaking, Large Vertical

## LOM-560/LOM-834, Orbital Shaking Incubator, Large Vertical Type



### Features:

- Useful for biological culture under various temperature.
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost.
- With safety switch to stop shaking when opening door
- Three-point bearing transmission is adopted suitable for heavy loads and continuous duty.
- Minimum noise, no vibration.
- Refrigeration using non cfc gas R134A
- Optional day/night light with timer.
- Transparent glass observation window & internal light.
- Provide clear visibility without opening the door.
- Uses brush less AC motor for long durability and stable performance of the shaking system.
- Overheat and over low protector, built-in circulating fan for temperature stability.



Model	LOM-560	LOM-560D	LOM-834	LOM-834D
Shaking platform	Single	Double	Single	Double
Temp. range	0°C~70°C			
Temp. Accuracy	±0.1°C			
Temp. control	Micro-computer PID temperature controller			
Temp. Display	LED 2-screen digital display actual and setting temperature			
Shaker Speed	20~250 rpm	20~150 rpm	20~250 rpm	20~150 rpm
Shaking width	50 mm			
Timer	999h / 999min / 999sec			
Heater	1600 W			
Illumination	Fluorescent lamp 20 W			
Shelf (Adjustable)	2	1	2	1
Refrigerator	1/3HP		1/2HP	
Volume	560L		834L	
Shaking Plate Size (mm)	740x480		960x600	
Inside dimensions (mm)	W860xD600xH1100		W1100xD690xH1100	
Outside dimensions (mm)	W940xD800xH1840		W1190xD920xH1840	
Weight (Approx.)	280Kg		300Kg	

### Capacity of flask holders

Model	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000
Flask clamps	125ml	250ml	500ml	1000ml	2000ml	3Liter	4Liter	5Liter
LOM-560	48	40	24	12	9	6	6	4
LOM-560D	96	60	40	24	-	-	-	-
LOM-834	78	50	36	18	10	10	8	8
LOM-834D	156	100	72	36	-	-	-	-



# Large Capacity, Refrigerated SHAKER-INCUBATORS

LOM-200N/400N, Precise Shaking Incubator, Top Door, Orbital Motion With Digital PID Control Up To 70°C



Optional: Tube Holders



FLASK HOLDERS



### Features:

- Useful for biological culture under various temp.
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost.
- With safety switch to stop shaking when opening door
- Three-point bearing transmission is adopted suitable for heavy loads and continuous duty.
- Minimum noise, no vibration.
- Refrigeration using non cfc gas R134A
- Optional day/night light with timer.
- Transparent glass observation window & internal light.
- Provide clear visibility without opening the door.
- Uses brush less AC motor for long durability and stable performance of the shaking system.
- Overheat and over low protector, built-in circulating fan for temperature stability.



Model	LOM-200N	LOM-400N
System	Forced air circulation	
Shaking system	Orbital	
Temp. range	0°C~70°C	
Temp. constancy	±0.1°C	
Temp. uniformity	±1°C (at 37)	
Temp. control / display	PID / LED	
Temp. sensor	PT-100	
Inside material	SUS-304	
Rate of shaking	20~250rpm	
Shaking width	50 mm	
Shaking plate	W600xD480mm	W960xD600mm
Refrigerator	1/4 HP	1/3 HP
Heater: Incubator	1200W	
Safety devices	Short circuit breaker, over heat protector, refrigerator over load protector, sensor abnormality, over low protector	
Inside dimensions	W680xD560xH540mm	W1040xD680xH540mm
Outside dimensions	W1010xD640xH870mm	W1370xD760xH870mm
Volume (Liters)	205	381
Power supply	110/220V, 50/60Hz, (8.5A)	
Weight	200Kg	300Kg

### Capacity of flask holders

Model	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000
Flask clamps	125ml	250ml	500ml	1000ml	2000ml	3Liter	4Liter	5Liter
LOM-200N	48	30	20	12	9	6	6	4
LOM-400N	96	60	40	24	15	15	12	8

# SHAKER-INCUBATORS For 2 or 4 Microplate, for Conical Tubes 15/50ml



**MOB-04A**  
4 MicroPlate



**MOB-02A**  
2 MicroPlate



**SI-50**



**CO-1518**  
Rack for 18x15ml



**CO-5012**  
Rack for 12x50ml

## Model: MOB-02A/04A, 2/4 MicroPlate Incubator Mixer Shaker

MOB-02A/MOB-04A Thermo-shaker incubator is a high performance microplate incubator and orbital shaker which accommodates up to 2/4 microplates. They can be used for any enzyme or cell-based assays requiring uniform and strictly controlled incubation up to 70°C & effective mixing.

Temperature, shaking speed, and incubation time are programmable via the keypad, while the status parameters are displayed on the LCD in real time via an easy to use interface.

Microprocessor controlled heating plates above and below microplates provide uniform temperature with less than 0.5°C variation between any two wells. This ensures our standing and repeatable assay performance.

### The devices can be used in:

- Cytochemistry - for in situ reactions;
- Immunochemistry - for immunofluorescent reactions;
- Biochemistry - for enzyme and protein analysis;
- Molecular chemistry - for matrix analysis.

### Features:

- Temp. range: from +8°C over room temp. to 70°C.
- Convenient upward opening door.
- Microprocessor controlled time, speed & temp.
- Accurately control & display time, temp. & speed.
- Heating platform for standard microtitre plates.
- Soft start, easy to setup & use.
- Audible signal to indicate end of shaking motion after program completion.
- LCD display.

Model	MOB-02A	MOB-04A
<b>Temperature range</b>	RT+8°C~70°C	
<b>Uniformity over the platform</b>	≤±0.5°C	
<b>Display accuracy</b>	0.1°C	
<b>Shaking speed</b>	100-1200 rpm	100-1500 rpm
<b>Orbit</b>	2mm	
<b>Independent timer</b>	1 min~99h59min	
<b>Heating Speed</b>	<25min from 20°C to 70°C	
<b>Power supply</b>	110/220 V, 60/50 Hz, max. 250VA	
<b>Platform capacity</b>	2 microtitre plates	4 microtitre plates
<b>Microplate dimensions</b>	W89xL133xH48mm	
<b>Dimensions</b>	280x270x140mm	320x350x185mm
<b>Weight</b>	6.5kg	9kg

## SI-50, Conical tube Mixer with heating for 15,50ml Conical Tubes

- Digital microprocessor control [PID] : digital display
- Well designed ventilation system provides with accurate temperature control
- Temp. range from ambient +5°C to 65°C
- Orbit of 6mm in low speed & orbit of 40mm in high speed
- Variable speed range: 60-500rpm
- High quality permanent DC brush less motor for gentle & powerful motion
- Continuous or timed operation
- Rack for 50ml conical tube: 12ea or Rack for 15ml conical tube: 18ea
- LED display (Shown actual speed or time)
- "up and over" door

Model	SI-50	
<b>Orbit range</b>	Low speed-6mm/High speed-40mm	
<b>Speed range</b>	60-500rpm	
<b>Capacity</b>	conical tube 50ml	12ea
	conical tube 15ml	18ea
<b>Temp. range</b>	Ambient +5°C~65°C	
<b>Temp. Accuracy</b>	±0.2°C	
<b>Timer</b>	99hours 59min	
<b>Dimensions (mm)</b>	W280xD423xH257	
<b>Weight (kg)</b>	14Kg	
<b>Wattage</b>	330W	

**SI-20 / SI-40 / TOU-H20 / TOU-C20, 2 micro well plate mixer with heating**



**SI-20/SI-40: for heating**

- Digital microprocessor control [PID]: digital display
- Well designed ventilation system provides with accurate temperature control
- SI-20/40: Standard platform for 2/4 micro well plates
- Temperature range from ambient +5°C to 65°C
- High quality permanent DC brush less motor for gentle and powerful motion
- Continuous or timed operation
- Optional rack (MR1.5-24) for 1.5ml centrifuge tubes
- Simple silicon holders for easy & speedy of plate installation
- LED display (Shown actual speed or time).

**TOU-H20: for heating,  
TOU-C20: heating & cooling**

- The internal mechanism & chamber are separated, resulting in no loss of heat.
- Digit. micro processor control (PID) for high accuracy
- Select between heating & cooling mode or heating mode
- Variable speed between 300 to 2000rpm
- Convenient upward opening door
- Standard platform for six microplates
- Simple silicon holders for easy & quick plate installation
- LED display for actual speed
- Safety features :  
-Flashing alarm lamp to warn over-temp.  
-Over-temp. cut-out  
-Over-temp. safety thermostat.



**TOU-H/C20**

**Plate Installation:**

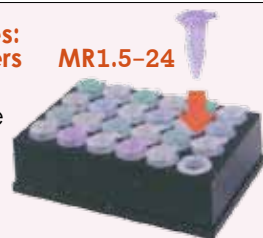


simple silicon holders allow quick & easy lifting of micro well plates & optional rack for 15ml centrifuge tube

**Accessories:  
for all mixers**

- 1.5ml centrifuge tube: 24ea

**MR1.5-24**



Model		SI-20	SI-40	TOU-H20	TOU-C20
Orbit range		3mm			
Speed Range	Deep well plate	300-1400rpm		300-2000rpm	
	Micro well plate & 1.5ml tube	300-2000rpm	300-1600rpm		
Capacity	micro well plate	2ea	4ea	6ea	
	deep well plate	2ea	4ea	6ea	
	1.5ml tube	48ea	96ea	144ea	
Temp. range		Ambient +5°C~65°C	Ambient +5°C~65°C	Ambient +5°C~65.0°C	15.0°C~65.0°C (cooling)
Temp. Accuracy		±0.2°C			
Timer		99hours 59min			
Dimensions (mm)		W280xD423xH257	W384xD423xH257	W470xD630xH410 mm	
Weight (kg)		10.5Kg	13Kg	34kg	39kg
Wattage		320W	580W	610W	810W

## SHAKER-INCUBATORS Rotating/Rocking

### SI-1401 Benchtop Shaking/Rotating Incubator, SI-1201 Benchtop Refrigerated Incubator








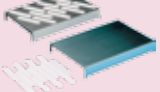





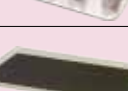





#### Features:

- Compact and lightweight.
- Magnetic Rotating/Rocking Platform & Clip Plate System holds almost any container at any angle.
- Expansion kits available for increased capacity and different containers.
- Viewing Window to inspect samples without affecting chamber environment.
- RS232 Port for computer control &/or data logging.
- Chamber air is gently & continuously recirculated ensuring temperature consistency and uniformity.
- Economical, Space Saving and Secure.
- An optional 3-D Orbital Shaker Attachment turns the unit into a 3-D Shaking Incubator.
- Precise temperature control and uniformity - range from 28°C to 75°C (SI-1401).
- Fast & Precise Temperature. 4-75°C for refrigeration or incubation (SI-1201).
- New crystal-clear backlit LCD displays all parameters in any lighting conditions at a glance (SI-1201).
- Two Integrated High Speed/Low Speed Magnetic Stirrers (SI-1201).
- Programmable Timers and Alarms for temperature and/or mixing (SI-1201).
- Peltier controlled Refrigeration & Heating (no compressor) (SI-1201).
- Ideal for Hybridization (SI-1401).

Model	SI-1401	SI-1201
<b>Supplied</b>	Magnetic Platform, 1 Clip Plate each for 10-13mm, 15-17mm, and 28-30mm Tubes, 4 Bag Mounting Strips, Non-Skid Tray and Stackable Shelf	Magnetic Platform, 1 Clip Plate each for 10-13mm, 15-17mm, and 28-30mm Tubes, 4 Bag Mounting Strips, Non-Skid Tray and Stackable Shelf
<b>Rotating</b>	3-35 RPM	1-35 RPM
<b>Rocking / Rocking Angle</b>	6-70 cycles per minute / ±10 degrees from horizontal	2-70 cycles per minute / ±10 degrees from horizontal
<b>Stirring</b>	-	1-2000 RPM including stir reverse
<b>Platform Capacity</b>	4.5 kg	4.5 kg
<b>Temperature Range</b>	28-75°C	4-75°C
<b>Accuracy / Uniformity</b>	±0.2°C / ±0.5°C	±0.2°C / ±0.5°C
<b>Resolution / Stability</b>	0.1°C / ±0.1°C	0.1°C / ±0.1°C
<b>Chamber Dimensions (DxWxH)</b>	254 x 362 x 260 mm	254 x 362 x 260 mm
<b>Overall Dimensions (DxWxH)</b>	400 x 560 x 368 mm Depth with Rocker Tray - 305 mm	495 x 622 x 368 mm Depth with Rocker Tray - 305 mm
<b>Chamber Volume</b>	24 L	24 L
<b>Weight</b>	19.5 kg	36 kg

## Accessories:

Model/Image	Description
	<b>6 Clip Plates For 12 Each 10–13mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 12 tubes with a diameter of 10–13mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie, or Incubator Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1120</b></span>
	<b>6 Clip Plates For 6 Each 15–17mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 6 tubes with a diameter of 15–17mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1121</b></span>
	<b>6 Clip Plates For 3 Each 28–30mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 3 tubes with a diameter of 28–30mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1122</b></span>
	<b>Clip Plate 10–13mm Tubes:</b> One metal clip plate to accommodate up to 12 tubes with a diameter of 10–13mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie & the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1123</b></span>
	<b>Clip Plate 15–17mm Tubes:</b> One metal clip plate to accommodate up to 6 tubes with a diameter of 15–17mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie & the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1124</b></span>
	<b>Clip Plate 28–30mm Tubes:</b> One metal clip plate to accommodate up to 3 tubes with a diameter of 28–30mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie and the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1125</b></span>
	<b>Magnetic Stainless Steel Bag Strip (pack of 16):</b> Tube Holder holds six 50mL tubes vertically. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary. <span style="float: right;"><b>SI-1126</b></span>
	<b>Expansion Kit (Two Stainless Steel Trays, 24 Magnetic Bag Mounting Strips):</b> Two stainless steel Trays and 24 magnetic Bag Mounting Strips used to attach sealed bags to the Magnetic Platform (Part No. 0A-1100-030) for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie for increased bag capacity. <span style="float: right;"><b>SI-1127</b></span>
	<b>2 Clip Plates For Hybridization Tubes:</b> Pack of 2 metal clip plates to accommodate one 35mm ID Hybridization Tube up to 300mm in length. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie. <span style="float: right;"><b>SI-1130</b></span>
	<b>Stackable Wire Rack:</b> Stackable Wire Rack may be used in the Enviro-Genie and the Incubator Genie to increase shelf space for use as a temperature controlled chamber. This is included in the Enviro-Genie and the Incubator-Genie. Two wire racks will fit inside the chamber to provide 3 levels for containers. <span style="float: right;"><b>SI-1131</b></span>
	<b>Serial Cable:</b> Serial Cable may be used to connect the Enviro-Genie to a computer via a serial port for data capture or programming. It is a standard 9-pin, female to female straight through serial cable. <span style="float: right;"><b>SI-1132</b></span>
	<b>2 Universal Clip Plates:</b> Pack of 2 clip plates with two elastic bands each for use with odd-shaped sample vessels. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie. <span style="float: right;"><b>SI-1134</b></span>
	<b>1 Magnetic Covered 100 Microtube Box:</b> Plastic box with hinged lid holds up to (100) 1.5ml or 2.0ml microtubes. A maximum of 4 boxes, 2 per side, can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator Genie. A maximum of 8 boxes, 4 per side can be attached to the Magnetic Platform for use with the Rotator Genie. <span style="float: right;"><b>SI-1135</b></span>
	<b>1 Clip Plate For 100ml Volumetric Flasks:</b> Metal clip plate to accommodate up to 4 100-ml Volumetric Flasks. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie. <span style="float: right;"><b>SI-1136</b></span>
	<b>Non-Skid Tray For Enviro-Genie / Incubator-Genie:</b> The Non-Skid Tray for the Enviro-Genie and the Incubator-Genie attaches to the Magnetic Platform (Part No. SI-1320) to rock open containers. The Non-Skid Tray measures 203 x 305mm (8 x 12in) and is included with the Enviro-Genie and Incubator-Genie. <span style="float: right;"><b>0A-1200-001</b></span>
	<b>3-D Orbital Shaker Attachment For Enviro-Genie / Incubator-Genie:</b> The 3-D Orbital Shaker Attachment for the Enviro-Genie and the Incubator-Genie provides gentle yet thorough mixing of dishes, flasks, beakers & open containers. It moves at a 5 degree angle through a 360 degree rotation (providing a combination of vertical and horizontal motions). This means that every corner or crevice of a container will receive complete mixing, making it the perfect choice for applications such as gel and blot staining/blocking, sample washing, polymer resin preparation, and more. Please note, platform capacity is 1 Kg. <span style="float: right;"><b>SI-1250</b></span>
	<b>Dual Port Mixing Tube:</b> A V-shaped glass tube with dual ports, which attaches magnetically to the Roto-Shake Genie, Rotator Genie, Enviro-Genie and Incubator-Genie using clip plate accessory SI-1130 (sold separately). Ideal for use in the rotating mode for mixing dry ingredients. <span style="float: right;"><b>SI-1137</b></span>

# CO2 INCUBATORS Water Jacket

## 3503-2, 42 Liter Small Water Jacket



3503-2

The 3500 Series of CO2 Incubators offer dependable Infrared (IR) CO2 Sensor control and are ideal for sensitive tissue and cell culture applications. They provide the benefits of contamination control and uncompromising temperature uniformity for even the most demanding incubations.

Precision is easily maintained with push-button calibration of both temp. and CO2, and audio/visual alarms that signal high/low temp. & CO2 conditions. Modular controls and backup systems ensure confidence for incubating valuable samples, providing the dependable assurance you expect from a MRC incubator.

### Features:

- Coved Corners for Easy Cleaning.
- New Anti-Corrosion Anode for Easy Set-Up & Tap Water Use.
- Patented Copper-Housed HEPA Filter for Superior Contamination Prevention.
- Built-In CO2 Tank Switcher (3517-2 & 3524-02).
- Factory Pre-Set Door Thermostat.
- Pre-Heated CO2 Gas Inlet for Increased Temperature Uniformity.
- Front-Mounted Connections for Convenience.

## 3517-2, 143 Liter Water Jacket



3517-2

Model	3503-2	3517-2	3524-2
<b>Capacity</b>	42 L	143 L	286 L
<b>Interior Dimensions (cm)</b>	40Wx40Dx26H	48.9Wx50.1Dx58.4H	48.9Wx50.1Dx58.4H per chamber
<b>Exterior Dimensions (cm)</b>	53.4Wx57.2Dx68.6H	66.1Wx64.8Dx102.3H	66.1Wx64.8Dx204.6H
<b>Temperature Range</b>	Ambient +8°C to 60°C		
<b>Temp. Uniformity</b>	+/-0.2°C at 37°C	±0.2°C at 37°C	±0.2°C at 37°C
<b>Electrical Specifications</b>	Volts: 220V, Hertz: 50/60Hz, Watts: 550W, Amps: 5A		
<b>CO2 Range</b>	0-20%	0-20%	0-20%
<b>CO2 Sensor</b>	Infrared (IR)	IR	IR
<b>CO2 Recovery Rate</b>	-	< 5 minutes	< 5 minutes
<b>Temperature Control</b>	Microprocessor	-	-
<b>Jacket Type</b>	Water Jacket		
<b>Relative Humidity Range</b>	Up to 95%		
<b>Shelving</b>	3 Supplied (8 max)	3 Supplied (16 max)	3x2 Supplied(32 max)
<b>Access Port (in)</b>	1	1.5	1.5

## 3524-2, Double 286 Liter Water Jacket Contamination Control:



3524-2

Extensive use of copper in the CO2 sample port, heated CO2 feed line, housing of the patented HEPA filtration system, and humidity pan with copper SL decontamination token, adds reassurance that foreign microbes will not affect test results. Cleanup is a breeze with the all stainless steel chamber, and autoclavable door gasket. Optional copper shelves are available for even more contamination control.

### Tissue & Cell Culture Applications

These incubators control three essential variables related to replicating the mammalian environment;

- Stable CO2 Level
- Controlled Temperature
- Relative Humidity (RH)

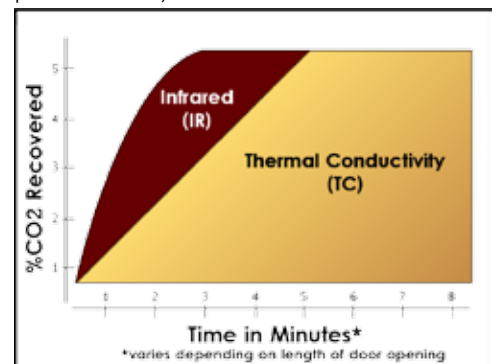
### Patented Copper Coated HEPA Filter

A "Bacteriostatic" copper cage to trap particulate matter and reduce potential for chamber contamination. This filter removes 99.97% of all airborne microbes and isolated microbes 0.3 microns or larger.



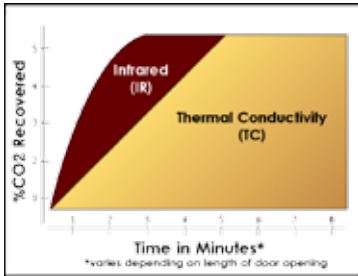
### Infrared (IR) CO2 Sensors

For the fastest CO2 recovery & most stable performance, this Series features IR sensors.





2406-2



### Infrared (IR) CO2 Sensors

For the fastest CO2 recovery & most stable performance, this Series features IR sensors.

- Independent Over Temperature Thermostat.
- Temperature & CO2 Alarm.
- Inner Glass Viewing Door.

### 2406-2/2406/2-2, Economy Air Jacketed

Our model 2406-2 was designed and manufactured to accommodate tight budgets, while maintaining the fundamental needs of quality and precision. These units have PID microprocessor controllers, a heated outer door and a tempered-glass inner door. They provide exceptional temperature uniformity, while minimizing cold spots that lead to condensation and ultimately, contamination.

Although they do not have a humidity display, the extremely stable temperature environment maintains constant humidity through evaporation at up to 95%.

The audible/visual alarms for temperature and CO2 respond to out-of-tolerance conditions. They offer an independent over temperature safety control to protect samples from overheating, and an optional CO2 tank switch/alarm to prevent prematurely exhausting the gas supply.

### Contamination Control:

Extensive use of copper in the CO2 sample port, heated CO2 feed line, and humidity pan with a copper SL decontamination token, adds reassurance that foreign microbes will not affect test results.

Cleanup is a breeze with the all stainless steel chamber, and autoclavable door gasket. Optional copper shelves are available for even more contamination control.

### Tissue & Cell Culture Applications:

- These incubators control three essential variables related to replicating the mammalian environment;
- Stable CO2 Level
  - Controlled Temperature
  - Relative Humidity (RH).



Model	2406-2	2406/2-2
Weight (kg)	140.6	281.2
Capacity	165 L	342 L
Exterior Dimensions (cm)	66Wx66.7Dx102.3H	66.1Wx65.5Dx203.2H
Chamber Dimensions (cm)	51.4Wx50.1Dx64.1H	52Wx50.8Dx64.7H
Temperature Range	Ambient +8°C to 60°C	
Temp. Uniformity	±0.2°C at 37°C	
Electrical Specifications	Volts: 120V Hertz: 50/60Hz Watts: 550W Amps: 5A	
CO2 Range	0-20%	
CO2 Sensor	IR	
CO2 Recovery Rate	< 5 minutes (Recovery)	
Relative Humidity	Up to 80%	
Jacket Type	Water	
Shelving	3 (16 Maximum)	3 each chamber (16 Max)

# CO2 INCUBATORS Air Jacket, High Heat Decontamination

## 5215-2, Air Jacket



5215-2

## 5230-2, Air Jacket



5230-2

### Contamination Control & Patented Copper Coated HEPA Filter

Model 5215 was designed to minimize contamination & be operational within hours of installation. This slim, lightweight incubator is easily repositioned with minimal downtime and is well-suited for multiple users. Three temperature control settings (main chamber, external door, and front liner) minimize condensation and yield precise temperature uniformity with no unwelcome temperature gradients. Our unique HEPA filtration system removes 99.97% of all airborne microbes and isolated particulates 0.3 microns or larger. The patented copper housing around the filter is designed to destroy microbes entrapped in the filter. Additional anti-contamination features include a stainless steel chamber with easy-to-clean coved corners, our Quick Clean Shelf System which disassembles without tools in less than a minute, and our Non-Tip Shelf System to reduce spills. A separate digital keypad with large, bright LEDs (for CO2 and temperature) is highly visible on the front panel. The audible alarms can be muted easily, and the redundant safety system for temperature protects samples from overheating. In addition, the CO2 gas supply is protected by a PID with an infrared sensor that is extremely quick to recover, a door switch that automatically turns off the gas when the door is opened, and a sample port on the side to help minimize waste during CO2 calibration.

#### Features:

- Copper Enclosed HEPA Filter.
- Pre-heated CO2 Gas Inlet.
- Infrared CO2 Sensor.
- Independent Over temperature Protection.
- Heated Outer Doors.
- Quick Clean Shelf System.

Model	5215-2	5230-2
Weight (kg)	113.4	226
Capacity	142 L	284 L (142 each)
Interior Dimensions (cm)	52Wx50.1Dx54.6H	52Wx50.1Dx54.6H
Exterior Dimensions (cm)	69.3Wx71.2Dx95.9H	69.3Wx71.2Dx191.8H
Temperature Range	Ambient +5°C to 60°C	Ambient +8°C to 60°C
Temp. Uniformity	±0.25°C at 37°C	±0.25°C at 37°C
Electrical Specifications	Volts: 120V Hertz: 50/60Hz Watts: 600W Amps: 5A	
CO2 Range	0-20%	
CO2 Sensor	IR	
CO2 Recovery Rate	< 5 minutes	
Jacket Type	Air	
Relative Humidity Range	Up to 95%	
Shelving	3 Supplied (16 max)	3 Supplied (16 max) per unit
Access Port	1.5	



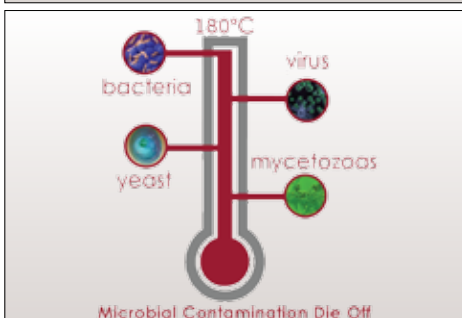
3552-2

## 3552-2, High Heat Decontamination CO2 Incubator

Decontamination is easier than ever. The Model 3552 is the latest addition to the 3500 Series of CO2 Incubators. Featuring a dry, high heat decontamination cycle, the Model 3552 features a dry heat decontamination cycle, that maintains 180°C for 120 minutes. This industry best time and temperature relationship satisfies all global standards for decontamination. This is decontamination at its fastest easiest and most effective - it is not necessary to remove the IR CO2 sensor prior to activating the decontamination process and we feature the shortest cycle time on the market. This is a more convenient approach and eliminates potential damage to the sensitive IR sensor. Other features of the 3552 include a USB interface for software communication, precise temperature control microprocessor and an independent over temperature safety controller.

#### Features:

- Dry Heat Decontamination at 180 degrees C for 120 minutes.
- Pre-heated Copper CO2 Gas Inlet for Increased Temperature Uniformity.
- No Handling of the IR Sensor.
- HEPA Filter.



### Contamination Control & Infrared (IR) CO2 Sensors

Model	3552-2
Weight (kg)	125
Capacity	169 L
Interior Dimensions (cm)	51.4Wx50.8Dx64.7H
Exterior Dimensions (cm)	72.4Wx78.2Dx100.4H
Temperature Range	Ambient +5°C to 60°C
Temp. Uniformity	±0.25°C at 37°C
Electrical Specifications	Volts: 120V Hertz: 50/60Hz Watts: 600W Amps: 5A
CO2 Range	0-20%
CO2 Sensor	Infrared (IR) ±0.1%
CO2 Recovery Rate	< 5 minutes
Relative Humidity Range	Up to 95%
Shelving	3 Supplied (16 max)
Access Port	1.5





2440-2

**Features:**

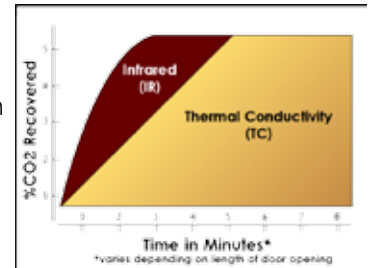
- Accommodates Roller Bottle Apparatus.
- Infrared CO2 Sensing Technology.
- Viewing Door.
- Independent Over temperature Protection.

**2428-2/2440-2/2460-2, Large Capacity Air Jacketed**

These units are well-suited for roller bottle apparatus & high-volume tissue culture applications & is ideal for cell harvesting. This large capacity incubator maximizes laboratory space in a convenient floor model design. Its chamber floor is specifically designed for easy movement of roller bottle apparatus by use of a flip-out ramp. Supplied with four 1 amp interior electrical outlets & gentle mechanical air convection that ensures excellent temp. uniformity, & eliminates cold spots. An infrared system accurately controls CO2 levels and provides fast CO2 recovery after door openings. This unit is supplied with six stainless steel shelves, which are adjustable on 1/2 inch increments.

**Infrared (IR) CO2 Sensors**

For the fastest CO2 recovery & most stable performance, this Series features IR sensors.



**CO2 Incubator Applications:**

- Cell & Tissue Culture.
- Immunology.
- Genetic Engineering.
- Protein Synthesis.
- Virology.
- Neurology.
- Pharmacology.
- In vitro Fertilization.
- Human Vaccines.
- Veterinary Vaccines.
- Carcinogenicity Testing.
- Monoclonal Antibodies.



2428-2

Model	2428-2	2440-2	2460-2
Weight (kg)	226.8	385.6	431
Capacity	879 L	1125 L	1641 L
Exterior Dimensions (cm)	100.4Wx85.5Dx191.2H	108Wx87.7Dx221H	129.6Wx113.7Dx203.2H
Chamber Dimensions (cm)	83.1Wx66.0Dx160.0H	88.9Wx66Dx191.7H	109.2Wx87.6Dx171.4H
Temperature Range	Ambient +8°C to 60°C		
Temp. Uniformity	±0.5°C at 37°C		
Electrical Specifications	Volts: 220V Hertz: 50/60Hz Watts: 1800W Amps: 15A (20A Cord Supplied)		
CO2 Range	0-20%		
CO2 Sensor	IR Accuracy ±0.1%		
CO2 Recovery Rate	< 5 minutes (Recovery)		
Jacket Type	Air		
Shelving	6 (30 Maximum)		
Interior Outlet	4		



## 2428H-2, Humidified Large Capacity

Model 2428H, is the newest addition to the large capacity CO2 incubator line. This 27 cubic foot incubator features active humidity control up to 95%. This unit has exceptional CO2 & temp. uniformity, along with a user controllable humidity system that is more accurate and responsive to door openings than a traditional water pan humidity system.

The 2428H-2 humidity system provides less evaporation of culture media & eliminates a potential source for contamination. Contamination is minimized by the heated glass door & an antimicrobial copper drain.

The triple-paned glass door allows for easy viewing of samples without having to open the incubator door, so samples can thrive in the stable environment within the chamber. A gentle horizontal airflow heating system is used for quick temperature recovery after door openings.

This airflow system obtains superior temperature control with minimal drying or disturbance of sample conditions. The CO2 is accurately controlled with an IR sensor, providing overall CO2 stability.

### Features:

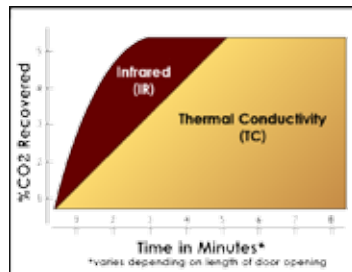
- Programmable temperature, over-temperature, CO2, humidity.
- Audible/visual alarm & alarm silence.
- Remote alarm contacts.
- Data outputs to help meet internal and regulatory documentation requirements.
- One thru-wall access ports for probes, sensors, power cords.
- Stainless-steel interior.
- Heavy-duty, solid stainless-steel shelves resist corrosion; adjust on 0.5 in. centers.



- Independent Over Temperature Thermostat.
- Temperature & CO2 Alarms.

### Infrared (IR) CO2 Sensors

For the fastest CO2 recovery and most stable performance, this Series features IR sensors.



Model	2428H-2
Weight (kg)	385.6
Capacity	740 L
Interior Dimensions (cm)	78.1Wx66Dx143.5H
Exterior Dimensions (cm)	99.7Wx94Dx199.4H
Temperature Range	Ambient +5°C to 50°C
Temp. Uniformity	±0.5°C at 37°C
Electrical Specifications	Volts: 220V Hertz: 50/60Hz Watts: 1550W Amps: 13A
CO2 Range	0-20%
CO2 Sensor	IR Accuracy ±0.1%
CO2 Recovery Rate	< 5 minutes
Jacket Type	Forced Air
Relative Humidity Range	Up to 95%
Shelving	6 Supplied (30 max)
Access Port	One



LI15-2

**Features:**

- LED Display of Set point and Chamber Temp.
- High and Low Limit Temperature Protection.
- Day/Night Light and Temperature Control.
- Fan Assisted/Forced-Air Circulation.
- Hermetically Sealed Compressor.
- Interior Electrical Outlet.
- Independent Over Temperature Thermostat.
- Temperature Range 0°C to 45°C at 20°C Ambient.
- Temperature Uniformity +/- 0.5°C at 20°C.

**LI15-2, Diurnal Plant Chamber**

MRC Diurnal growth chambers are designed for studies requiring day and nighttime simulation. This unit features dual-program selector dials, which allows control of two temperature conditions and an ON/OFF illumination cycle relative to the program selected. Each system operates independently allowing for simulation of a diurnal cycle, such as an eight hour day cycle of 30°C with light followed by a sixteen hour night cycle of 18°C without light. Forced air circulation ensures the most reproducible test conditions. The chamber air is gently and continuously circulated at a rate that ensures temperature uniformity of all test samples. The unit is equipped with a hermetically-sealed compressor and an independent over temp. safety controller. In addition, a one amp interior outlet allows use of shakers, stirrers, roller bottles or other apparatus. This chamber is ideal for plant growth studies.



Model	LI15-2
Exterior Dimensions (wxdxh)	87.7x87.7x196.9 cm
Chamber Dimensions (wxdxh)	68.5x58.4x143.5 cm
Temperature Range	0°C to 45°C at 20°C Ambient
Temperature Uniformity	± 0.5°C at 20°C
Incubator Chamber Capacity	574L
Interior Outlet	220V
Bottle Capacity	317
Number of Shelves	4 included

**LE-250B, Stability Testing Chamber, Temperature, Humidity, Light**



**LE-250B**



**Air duct structure**

Applies circular airflow design concept & forced convection simulated air circulation principle. The high power air circulating blades specially designed to produce higher air flow rate & guarantee high even and stable inner bag temperature and humidity.

The humidity can be precisely controlled within the range of 20% to 98% to realize effective and stable test effect.



**Touch screen**

Super large touch screen. intelligent operating system and 32-digit processor are equipped to simplify the operation and to be more humanized.



**High precision electronic temperature sensor**

It is used for absolute precise humidity measurement. The humidifying and dehumidifying system is controlled electronically. ROTRONIC

electronic humid. sensor can guarantee the reliability of humidity inspection even if the samples are changed frequently. The sensor does not require maintenance.



**Innovative refrigerating system**

International famous brand refrigerant compressor and Germany EBM condenser applying 134a, refrigerant fluorine free, environmental protection, precision and high efficiency are applied.



**Illumination effect**

One-side illumination concept is applied to better conduct authentic and real-time light stability test on active substance.



**Test hole**

One test hole with the diameter of 45mm made with special mould is arranged on the left & right of the incubator respectively for observation. Internal silica gel soft plugs

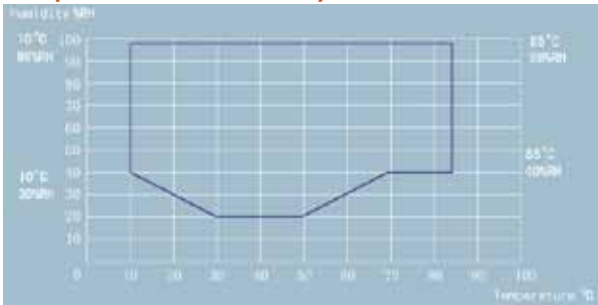
are provided to make sure the temperature and humidity inside the incubator are not effected during the test.



**RS232 interface**

It is a interface for PC.

**Temperature and humidity**



**Features:**

- The incubator is made with imported NC machine tool and laser processing technology. The outside incubator body applies high quality cold rolling plate, which is strongly resistant to rusting. The inner bag applies SUS304 stainless plate.
- The incubator bottom truckle is imported from Japan. Its direction is adjustable and it can be locked. The outside incubator body is sprayed with American Dupont powder.
- One test hole with the diameter of 45mm made with special mould is arranged on the left and right of the incubator respectively for observation. Two silica gel soft plugs are provided inside.
- The heat insulating material applies Germany Bayer CFC-free polyurethane one-time foaming technology to improve the insulating property and reduce-energy consumption.

It can save over 30% in energy compared with similar products.

- Rational air duct structure; balance type control method; imported special electric motor and blade are applied to make temperature and humidity distribution evened and greatly improve test precision and evenness of temperature and humidity.
- International famous brand refrigerant compressor and Germany EBM condenser applying 134a refrigerant and featuring fluorine free, environmental protection are applied and conform to the world trends.
- Super large touch screen, intelligent operating system and 32-digit processor are equipped to simplify the operation and programming.
- Programmed temperature and humidity control; micro-computer fuzzy control PID control; temperature priority and time priority; optional for the user.
- Temperature sensor PT100 applies Honeywell product. The humidity sensor applies Swiss Rotronic capacitive sensor.
- Over-temperature protection, creepage protection, door open alarm, current failure alarm and sensor alarm functions are provided to improve the safety. Meanwhile, automatic start, stop, timed operation, clock display and self recover after energizing are provided.
- R-232 communication interface, USB storage, GRPS remote control alarm functions are provided.
- Automatic defrosting and manual defrosting functions are provided for long term test to solve the problem of temperature and humidity drifting.

Model	LE-250B
Convection method	Compulsory convection method
Control method	Balance type
Temperature range	No illumination -15°C ~ +85°C With illumination 10°C ~ +85°C
Humidity control scope	20 ~ 98%
Temperature resolution	0.1°C
Temperature fluctuation	±0.1°C
Temperature evenness	±1.0°C (65°C)
Humidity fluctuation	Within ± 1.5% (65°C)
Working room temperature	5°C ~ 35°C
Illumination intensity	0-6000LX adjustable
Illumination error	≤ ±300LX
Insulating material	Overall foaming of polyurethane
Programmed control	Fuzzy logistic PID control method common operating mode/programmed operating mode
Overall dimension(mm)	W765 x D733 x H1490
Inner dimension (mm)	W640 x D400 x H890
Weight	About 137KG
Effective volume	250L
Total power of heating and humidifying	2000W
Refrigerating power- refrigerant	270W,R134a
Water supply volume	Inside: 10L Outside: 25L
Power voltage	AC-220V 50/60Hz
Tray (standard configuration)	Three layers



## PGI-550R/PGI-550RH, Plant Growth Incubator 550 Liter

- Customized design
- Apply to microorganism Lab / Cell culture / Biotechnology experiments / Analytical Lab / Food Science and Technology / Agricultural Lab / The Fisheries Laboratory / Gardening / Plant Research / Seeds.

Illuminated growth chamber controllers, allow setting of two temp. conditions day & night & an On/Off illumination cycle relative to the program selected. Timers can be set to adjust cycles from 10 minutes up to 24 hours.

Each system operates independently allowing for simulation of a diurnal cycle, such as an eight hour day cycle of 30°C with light followed by a sixteen hour night cycle of 18°C without light.

Forced air circulation ensures the most reproducible test conditions. The chamber air is gently & continuously circulated at a rate that ensures temp. uniformity of all test samples. The unit is equipped with a hermetically-sealed compressor & an independent over temp. safety controller. It also includes a circuit breaker to protect from electrical overload, 5 shelves, adjustable leveling feet, steel exterior with welded seams & corners, & double-coated, baked enamel finish.

MRC Diurnal growth chambers are designed for studies requiring day and night time simulation.



Internal

Model	PGI-550R	PGI-550RH
Temperature Range	0°C ~ 60°C	
Temperature Control	PID temperature controller, PV actual value and SV setting value displayed at the same time	
Temperature Precision	±0.1°C	
Touch Setting	Power, cooling temperature, humidity, illumination timer device	
Safety Device	overheat and over low cut off device. 2-stage protection with safety protection alarm and indicator, compressor delay-start, high and low pressure of cold media protection device	
Heater	1200 W SUS 304#	
Refrigerator	1/3 HP R134a	
Humidity Display	-	PID temperature controller, PV actual value and SV setting value displayed at the same time
Humidity Control	-	30% RH ~ 95% RH
Control Precision	-	± 3%
Humidity Display	-	Digital
Humidity Device	-	Ultrasonic wave stainless steel (Back-mounted)
Illumination	4000-8000 LUX	
Timer	24H Temperature and light control	
Shelf / Inner Chamber	5 psc / SUS 304# stainless steel	
Inside Dimension (WxDxH)	680 x 580 x 1400 mm (Approx 550 L)	
Outside Dimension (WxDxH)	760 x 820 x 1870 mm	
Volume	550 L	
Power Voltage	110V/220V14A/7A	110V/220V16A/8A
Weight	150 kg	180 kg



**PGI-2460/PGI-2460H/PGI-2660/PGI-2660H,  
Growth Chamber with High Illumination**

- Animals, plant cell culture
- Insect
- Plant culture
- Tissue culture
- Domestication treatment
- Algae culture
- Pathology observation
- Biochemical experiment.



Model	PGI-2460/ PGI-2460H	PGI-2660/ PGI-2660H
Temperature range	0°C ~ 45°C	
Temperature control	Micro-computer PID temperature controller, PV actual value and SV setting value displayed at the same time, with independent day/night temperature	
Control Precision	±0.02°C dpi 0.1°C	
Touch Setting	Power, cooling, temperature, humidity, light, timer, all using touch setting	
Safety Device	Electronic LCD display, precision setting 0.1°C, overheat and over low cut off device. 2-stage protection with safety protection alarm and indicator, compressor delay-start, high and low pressure of cold media protection device	
Heater / Cooler	1KW SUS 304# / 7000 BTU	1.5KW SUS 304# / 12000 BTU
Humidity Control	Micro-computer PID temperature controller, PV actual value and SV setting value displayed at the same time	
Humidity Range	30% RH ~ 90% RH	
Control Precision	±0.02% dpi: 0.1%RH / ±3% RH	
Display / Safety Device	Digital display/Electronic setting precision 0.1%RH, with high or low humidity alarm	
Humidifier	Ultrasonic wave stainless steel humidifier	
Illumination Device	4-sides glasses heat insulation illumination: 0-30000LUX for choose, independent light control	
Timer Device	24h temperature and light control	
Shelf / Material	5pcs	10pcs
Inside Dimension (WxDxH)	620 x 620 x 1300 mm	1200 x 690 x 1300 mm
Outside Dimension (WxDxH)	910 x 930 x 2070 mm	1490 x 1000 x 2070 mm
Weight	500 L	1076 L
Power Voltage	220V 50/60Hz	



**LE-F130/LE-FH130, High Illumination**

The LE-130 can be used for botanical cell, botanical tissue culture, microbial culture studies. The temperature (CO2 level) are controlled through the PID system. The large (7") control panel allow to set the four walls illumination intensity and photo period, also the temperature (& CO2 level).

**Control Panel:**

- Temperature display: setting value display
- Color control panel: TFT7"
- Control temperature, time & lighting (optional: RH, for LE-FH130)
- 2 different set temperature for day & night for LE-FH130
- Timer alarm.

**Optional:**

CO2 detector (0-5000ppm) and control.  
CO2 detector NDIR.



**Safety devices:**

- Automatic abnormality detection
- Electronic overheat protection
- Low temperature protection
- Delayed start (compressor) option
- Smart automatic defrosting device
- Best use in low-temp environment
- Boil dry protection for LE-FH130.



**Remote monitoring**



**Alarm**



**Recording**



**Control & Display**

Model	LE-F130-15	LE-F130-30	LE-FH130-15	LE-FH130-30
<b>Temperature range</b>	5~40°C (w/o illumination) 10~40°C (illumination)			
<b>Illumination</b>	15,000Lux	30,000Lux	15,000Lux	30,000Lux
<b>Temp. Accuracy</b>	±0.5°C			
<b>Temperature controller</b>	Microprocessor PID controller, non-contact SSR output			
<b>Humidity range</b>	-		Designed to your specifications	
<b>Humidity accuracy</b>	-		±2%RH	
<b>Humidifying type</b>	-		Ultrasonic/Steam	
<b>Interior material</b>	SUS #304 stainless steel			
<b>Door</b>	2 layers			
<b>Shelves included</b>	4 Shelves			
<b>Exterior material</b>	Powder coating			
<b>Compressor</b>	-		1/3HP (~4000BTU)	
<b>Inner size</b>	W620XD620XH1200mm (±5mm)			
<b>Volume</b>	460 Liter			
<b>Exterior dimension</b>	W920X D960X H2050mm (±5mm)			
<b>Power</b>	220V ± 10%, 50/60Hz			





LE-FH230

**Safety devices:**

- Automatic abnormality detection
- Electronic overheat protection
- Low temperature protection
- Delayed start (compressor) option
- Smart automatic defrosting device
- Best use in low-temp environment
- Boil dry protection for LE-F/FH230.

**Control Panel:**

- Temperature display: Instruction and setting, setting value display
- Color control panel: TFT7"
- Control temperature, time and lighting (optional: RH, for LE-F/FH230)
- 2 different settable temperature for day and night for LE-F/FH230
- Alarm set time.

**LE-F230/LE-FH230 Series, High Illumination**

The LE-F/FH230 can be used for botanical cell, botanical tissue culture, microbial culture studies. The temperature (CO2 level) are controlled through the PID system. The large (7") control panel allow to set the four walls illumination intensity and photo period, also the temperature (& CO2 level).

**Application:**

- Cultivation of Algae
- Plant Grows Seedlings & Germinating Experiment
- Seed and Tuber Preservation
- Food Preservation Experiment
- Tissue Culture for fruit trees and flowers
- Plant Disease Experiment
- Various kinds of Raise
- Plants Cultivation
- Microorganism Culture
- Insect Raising.

**Optional:**

- CO2 detector (0-5000ppm) & control.
- CO2 detector NDIR.



Recording

Control & Display



Remote monitoring

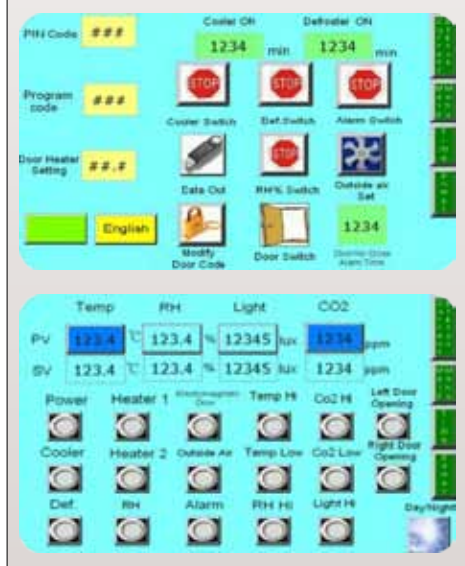
Alarm

Model	LE-F230-20	LE-F230-30	LE-FH230-20	LE-FH230-30
Temperature range	5~40°C (w/o illumination), 10~40°C (illumination)			
Illumination	20,000Lux	30,000Lux	20,000Lux	30,000Lux
Temp. Accuracy	±0.5°C			
Temperature controller	Microprocessor PID controller, non-contact SSR output			
Humidity range	-		Designed to your specifications	
Humidity accuracy	-		±2%RH	
Humidifying type	-		Ultrasonic/Steam	
Heater wattage	-		1.2KW	
Interior material	SUS #304 stainless steel			
Door	2 layers			
Shelves included	8 Shelves			
Exterior material	Powder coating			
Compressor	-		1/3HP(~4000BTU)	
Inner size	W1295XD660XH1200mm (±5mm)			
Volume	1025 Liter			
Exterior dimension	W1580X D960X H2050mm (±5mm)			
Capacity	1000L			
Power	220V ± 10%, 50/60Hz			



**LE-80FLED**

### Touch screen control panel



### LE-80FLED, LED Environment

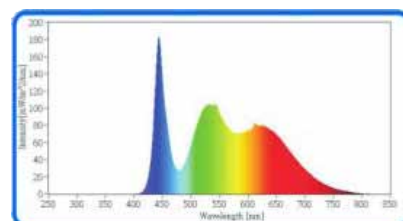
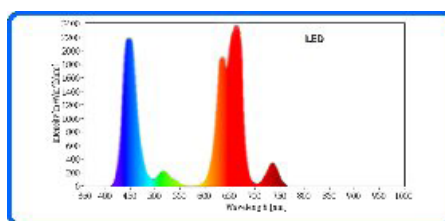
With his compact size the LE-80FLED is the perfect tool to study in a little space the effect of the LED light on the physiognomy of the plant. Fully programmable the LE-80FLED is a concentrate of technology. The Environment of the plant is completely controllable. Temperature, RH, Photo period, (CO2 control).

### Area of Application

Morphology Analysis, Algae Cultivation, Insect Raising, Microorganism Culture, Tissue Culture for corps, fruit trees and flowers.

### Illumination system:

- Light source LED,
  - 3 wavelengths: B450nm,G525nm, R660nm
  - Optional: 6 wavelength: 425, 450, 525, 640, 660, 735nm
- Illumination power: Optical disc high less than 20cm>5000lux
- LED plate size: 200x200mm
- Light quality: 0~200  $\mu$  mol s<sup>-1</sup> m<sup>-2</sup>, Adjustable
- BRIR: B450nm, R660nm, IR735nm
- Intensity: @ 20cm > 8000LUX.



### Light Control:

- Frequency: C1~C6: 0-5000 Hz
- Duty Ratio: C1~C6: 0-100%
- Illumination: C1~C6: 0-100%
- Phase Shift Range: C1~C6: 0-100%
- Timer: C1~C6: Programmable 0:00-24:00
- Work with PLC device.

### Temperature:

- W/O illumination: +10°C to 45°C
- W/ illumination: +15~40°C
- Cooling capacity: TEC 200W
- Environmental Condition: 0°C to +35°C.

### Control Panel:

- Temperature display
- Color control panel: TFT7"
- Control temperature, time and lighting (optional: RH,CO<sub>2</sub>)
- All conditions can be recorded
- Multi-purpose photo source control system: 6 groups of photo sources channel, luminosity, frequency
- Data output & compact flash card / USB port / RS-232.

### Structure:

- Inner material: SUS#304
- Power: 110V/220V, 50/60Hz.

### Optional accessories:

- Humidify System
- CO2 Controller 0-5000PPM
- CCD Camera System
- Plant Physiological cycle analysis system.



Model	LE-80FLED
Temperature range	10°C ~ 45°C ± 3°C
Wet range	60 ~ 95% ± 3%
Capacity	80L
Glasswork Windows	W20 x H30 safe double glazing
Interior dimensions	W460x330xH530mm
Exterior dimensions	W522xD639xH920mm



LE-740F

**LE-740F/740FH, Growth Chambers**

With its unique adaptability to different research applications, the LE-740F/FH offers an economical and flexible equipment platform. Incubation, Tissue Culture, Plant Growth, etc...

LE-740F/FH integrate our PID control system associated to the large Interactive TFT 7" control panel.

Temperature, time, light, Relative Humidity, Alarms can be set easily using the control panel.

If you want to save your settings, it's really easy and secure.

The USB port allow you to save your data manually, but if you are not at your laboratory but you need some information from your growth chamber, we've created a cloud system where your data is automatically save on a server (optional), like that it's easily that you can login and access to your precious information via the server.

Recently we also developed a remote control system that allows you to be 24h/24h connected to your growth chamber and control it even if you are on the other side of the planet.

**Illumination System:**

- Light source LED
- Provide spectrum range: 400~740 nm
- Light quality: Max. 200µmols<sup>-1</sup> m<sup>-2</sup> adjustable.

**Temperature:**

- Temperature range: +5~ 40°C(W/O illumination)  
+10~40°C(W/ illumination)
- Temperature accuracy: ±0.3°C at 25°C
- Temp. control: Microprocessor PID controller (PT-100Ω)
- Heater wattage: 600W
- Compressor : 1/3 HP.

Model	LE-740F	LE-740FH
<b>Temperature range</b>	5~40°C (w/o illumination), 10~40°C (illumination)	
<b>Temp. Accuracy</b>	±0.3°C at 25°C	
<b>Temp. Control</b>	Microprocessor PID Controller	
<b>Illumination</b>	1200-8000Lux (optional LED plate available)	
<b>Humidity range</b>	-	50 - 95% (W/O illumination)
<b>Humidity accuracy</b>	-	±3%
<b>Humidifying type</b>	-	Ultrasonic Type
<b>Humidity Sensor</b>	-	Hygroscopic polymer
<b>Humidity display</b>	-	Digital
<b>Volume</b>	500L	
<b>Shelves included</b>	3 Shelves	
<b>Interior material</b>	SUS #304 Stainless Steel	
<b>Exterior material</b>	Powder coating	
<b>Power</b>	220V ± 10%, 50/60Hz	
<b>Interior dimension</b>	W700XD600XH1150mm	
<b>Exterior dimension</b>	W870X D800X H1950mm	
<b>Weight</b>	210kg	235kg

**Safety devices:**

- Automatic abnormality detection
- Electronic overheat protection
- Low temperature protection
- Delayed start (compressor) option
- Smart automatic defrosting device
- Best use in low-temp environment.

**Control System:**

- 3.5" Touch panel Display
- Operating interface include:
  - Actual conditions of Temp./Light/ Alarm...displayed
  - Set-point and actual conditions of temperature displayed in large characters.
  - Multi Set-Point functionality ex: Hi/Lo temp. alarm function, defrosting switch, cooling system switch etc.
  - Infinite cycle capability for long-term experiences:
    - ON/OFF period
    - Day and Night Temperature
    - Photo period (Fluorescent tube)
  - Light, Cooling and Alarm system real time control
  - Date, Time, Reason of the Alarm are recorded.
  - Temperature recorded every 5min
  - Temperature curve available.

**Main supply:**

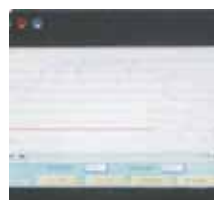
- Power: 220V 50Hz.



Remote monitoring



Alarm



Recording



Control & Display

EDX-POCKET are designed for on-site analysis in the wild, featuring small, light, precise, rapid, beautiful, safe, convenient, waterproof & long-standby time. Equipped with digital multi-channel technology, it greatly improves the detection limit and stability of the instrument, expanding the application fields. The products has passed strict testing and inspection, and all index are accorded with the related technological requirements, reaching the international advanced level.



## EDX-POCKET4-3, Handheld Hazardous Elements Analyzer

### Performance Advantage

#### Perfect performance as desktop

Small power integral end-window miniature X-ray tube, large dimensional beryllium window Silicon Drift Detector (SDD, the best detector in the world), and miniature digital signal multi-channel processor, greatly reduce the testing time and testing deviation, & improve the testing precision, requiring similar performance as the desktop.

#### Small & light body, easy for carry

Operation of on-site and in-situ detection at anytime or anywhere.

#### Rapid & nondestructive detection

1-2secs for rapid detection, more than 10secs for precise detection, whose results are similar to the results gotten in lab. No destruction to samples.

#### Detection of light elements

Helium-charging system (optional) greatly expands measurable range (analyze elements from Mg), satisfying the requirements of customers for light elements detection.

#### HD camera for convenient observation

Observation of testing position at any time.

#### Direct testing

It can directly analyze on the surface of the analyses, without needing of preparing samples.

#### Simple deviation calibration

Built-in intensity calibration method ensures simple deviation calibration caused by different geometry shapes and none homogeneous structure density.

#### Professional software for easy operation

It is equipped with professional hazardous elements analysis software. Combining FP with EC software, it is easy for operation and acquiring wider application fields.

#### Faster data transmission

Built-in system, HD touch screen (resolution 640x480), digital multi-channel technology, and SPI data transmission technology, effectively accelerate the data transmission and improves the counting ability.

#### Multiple safety protection, caring for health

Automatically shut-down of X-ray light tube within 2 seconds with no sample in testing; the radiation level is far lower than the international safety standard; compliment away test safety cover.

#### Powerful battery & convenient charging

Compliment away two Lithium batteries (7800mAH), it can continuously work for 8 hours all together. It is convenient for charging because of wide voltage AC charger and Onboard charger.

#### Multiple protections

Waterproof and dust proof function provide the ability of working under high temperature and humidity. Its body is manufactured with high strength military material, which is moisture proof, shockproof, and pressure resistant.

#### Simultaneously testing elements

It can detect the elements such as Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Cd, Sb, Hg, Pb. And it can detect more elements according to the customers' requirements.

### Application Fields

- For RoHS & hazardous elements testing of super huge articles
- For on-site testing of electronic components and parts
- For on-site random testing of various kinds of toys, children's products, and gifts
- For packing material testing and verifying
- For various kinds of batteries hazardous substance testing and verifying
- For hazardous elements testing in cloth, shoes material etc.
- For hazardous elements testing in electroplate liquids
- For hazardous elements testing in jewelry, ornaments etc.

### Testing Advantages for Application

#### 1. Testing super huge articles

Due to the huge size of the specimen it can not be tested by common desktop instrument. This problem has been solved by this handheld instrument.

#### 2. Testing toys

Because of various kinds of toys, it is impossible for repeated sampling in labs. Now this handheld analyzer is applied for on-site testing. Thus it greatly reduces the production cycle.

#### 3. Testing package materials

Because of the large sizes and large amounts of printing ink, it is impossible for rapid & comprehensive testing with desktops. Now these problems can be solved by handheld analyzer.



### Application:

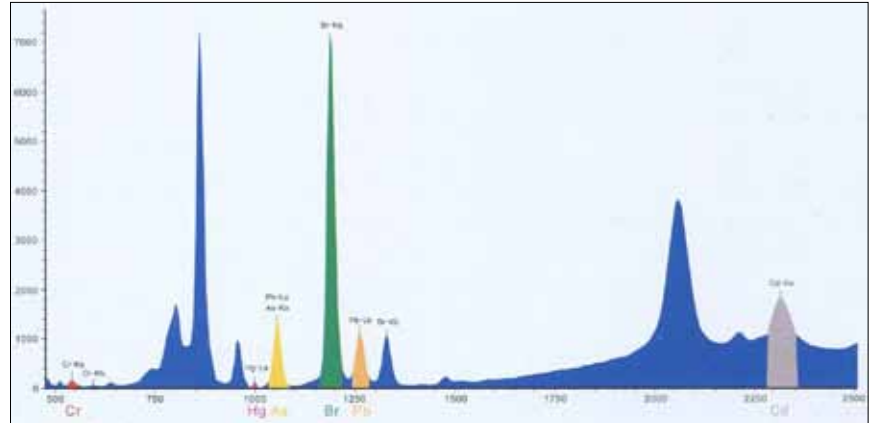
EDX-Pocket-III is widely used in toy safety testing, electrical and electronic and RoHS testing etc. After the issue of European Union toy statement, the instrument quickly finds its position in toy safety testing. It can be used for quantitative & qualitative testing for electronic components and parts; for third-party assessment to electronic components and raw material suppliers; for testing and verifying of packing material; for RoHS testing of various kinds of batteries; for testing of various kinds of toys, children's products, and gifts; for unlimited testing of big objects; for accurate positioning of precise components; for nondestructive testing of valuables.

### Application Advantages for RoHS:

- Equipped with newest SOD (minimum resolution < 139eV), it achieves more precise testing to trace hazardous elements.
- Equipped with HD camera, it supports more accurate positioning, achieving precise testing to tiny articles, such as pins.
- Newly software provides more effective algorithm & more functions, increasing testing precision of hazardous elements.
- Helium-charging system (Optional) greatly expands testing precision to halogen, especially Cl elements.

### Testing Data:

EC681 K Testing Result



Content Unit	PPM	EC681K					
Number	Working Curve	As	Br	Cd	Cr	Hg	Pb
1	PE	30.5568	775.628	140.4	24.194	103.15	100.973
2	PE	30.4782	770.526	140.08	24.764	100.52	99.2205
3	PE	31.5777	766.347	135.44	24.294	98.674	102.973
4	PE	29.9576	769.997	136.38	25.216	100.2	100.845
5	PE	30.3706	769.872	133.74	24.216	101.08	102.973
6	PE	30.6149	771.922	134.2	23.975	100.79	103.976
7	PE	30.391	771.009	135.32	24.5	100.99	101.487
8	PE	30.3195	768.284	136.61	25.167	99.502	99.5987
9	PE	30.6208	769.656	135.56	24.196	103.65	97.705
10	PE	30.8942	768.275	133.53	24.699	98.026	103.761
<b>True value</b>		29.1	770	137	23.7	98	100
<b>Average value</b>		30.5781	770.152	136.13	24.522	100.66	101.351
<b>Standard Deviation S<sub>n</sub></b>		0.40532	2.363	2.2759	0.4059	1.6701	1.9819
<b>Triple S<sub>n</sub> Value</b>		1.21595	7.08901	6.8276	1.2178	5.0104	5.94569
<b>Range R<sub>pm</sub></b>		1.62	9.28	6.87	1.24	5.62	6.27
<b>Relative Standard Deviation</b>		1.33%	0.31%	1.67%	1.66%	1.66%	1.96%
<b>Testing Deviation Σ (%)</b>		5.08%	0.02%	-0.64%	3.47%	2.71%	1.35%



**EDX-POCKET4-5**

### Application Field

EDX-POCKET-V is widely used for various kinds of alloy analysis.

The analytical precision is 2 to 3 times more precise than common alloy analyzer. And testing samples include solid, debris, or any other tangible alloy objects.

It can accurately analyze all kinds of high & low alloy steel, stainless steel, tool steel, chromium/ molybdenum steel, nickel alloy, cobalt alloy, nickel/cobalt heat resistant alloy, titanium alloy, copper alloy, bronze, zinc alloy, tungsten alloy etc. Through determination of other alloy elements, it also can identify the light alloys such as Al, Mg and can be used for reliable identification and confirmation of material. It can be applied for incoming material determination in iron & steel smelting, boiler and other high-temperature and high-pressure industries, to ensure the quality of the material. It also can be used for alloy content analysis in shipbuilding, aerospace and other high-tech industries, to ensure the quality and safety of the product. It can be applied in power plant and other national economy and people's livelihood industries for components determination and safety of the devices. While according to scrap metals recycling and utilization industries, it can quickly analyze and categorize a large number of scrap metals, offering the necessary information for both sides in purchasing & selling. It is the powerful weapon for metal & steel identification in renewable and re usage of scrap metals resources industry, which greatly contributes to the development of resource recycling industry. It also can be applied for recovery of steel backlogged in warehouse, classification of various metals in salvage station, and cutting of turnery and debris.

### EDX-POCKET4-5, Handheld Alloy & Stainless Steel Analyzer

#### Performance Advantage

##### Perfect performance as desktop

Small power integral end-window miniature X-ray tube, large dimensional beryllium window Silicon Drift Detector (SDD, the best detector in the world), and miniature digital signal multi-channel processor, greatly reduce the testing time and testing deviation, and improve the testing precision, requiring similar performance as the desktop.

##### Small & light body, easy for carry

Small body. Easy to carry. Convenient for wild work. Can operate on-site and in-situ analysis at anytime or anywhere.

##### Rapid & nondestructive detection

1-2secs for rapid detection, More than 10secs for precise detection, whose results are similar to the results gotten in lab, No destruction to samples.

##### Detection of light elements

Helium-charging system (optional) greatly expands measurable range (analyze elements from Mg), satisfying the requirements of customers for light elements detection.

##### Direct testing

It can directly analyze on the surface of the analytes, without needing of preparing samples.

##### Simple deviation calibration

Built-in intensify calibration method ensures simple deviation calibration caused by different geometry shapes and none homogeneous structure density.

##### HD camera for convenient observation

Observation of testing position at any time.

##### Professional software for easy operation

It is equipped with professional alloy analysis software. Combining FP with EC software, it is easy for operation and acquiring wider application fields.

##### Faster data transmission

Built-in system, HD touch screen (resolution 640x480), digital multi-channel technology, and SPI data transmission technology, effectively accelerate the data transmission and improve counting ability.

##### Multiple safety protection, caring for health

Automatically shut-down of X-ray light tube within 2 seconds with no sample in testing; the radiation level is far lower than the international safety standard; compliment away test safety cover.

##### Powerful battery & convenient charging

Compliment away two Lithium batteries (7800mAh), it can continuously work for 8 hours all together. It is convenient for charging because of wide voltage AC charger and Onboard charger.

##### Multiple protections

Waterproof and dust proof function provide the ability of working under high temperature and humidity. Its body is manufactured with high strength military material, which is moisture proof, shockproof, and pressure resistant.



### Application Case

#### 1. Reliability Analysis

Simply trigger the instrument; the results of material contents will come out. Now you do not need the material reports, the only need that is to have our fourth generational handheld EDX-POCKET-V. With 10 seconds of nondestructive testing to the sample, you can know the quality and quantity of the material, which can prevent the cheat from the material provider.

#### 2. Quality Guarantee/Quality Control

During the process of alloy material production and machinery equipment manufacturing, material identification and element testing is indivisible. To prevent the lost caused by the mixture of raw material, the fourth generational EDX-POCKET-V provides professional nondestructive testing, which effectively prevent the lost from mixture of raw material.

#### 3. Recovery of Scrap Metal

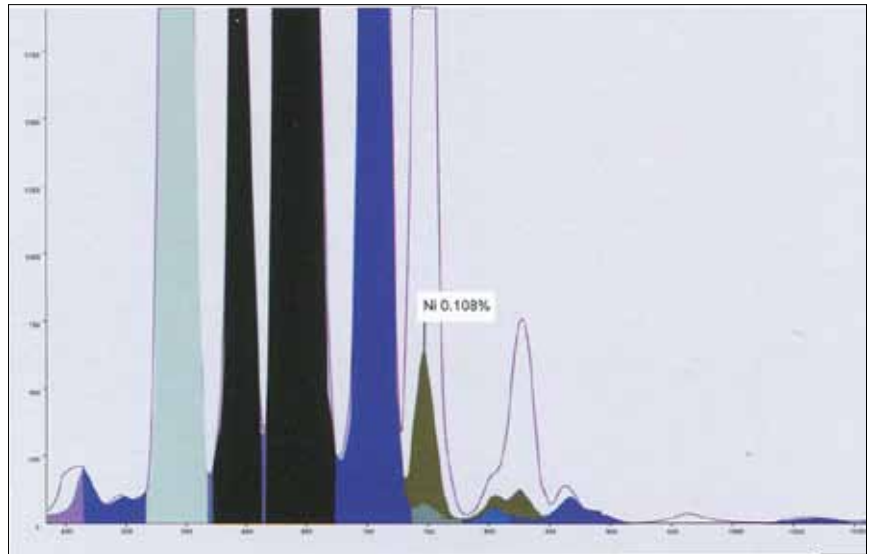
The fourth generational EDX-POCKET-V provides the immediate nondestructive testing from titanium alloy to nickel alloy, widely applied for classification of various kinds of alloy material.

### Core Application Field

Iron and steel Recovery of scrap metals  
Machinery manufacture & process Boiler pressure vessel.

### Analytical precision

Measurement Precision of Main Elements in Stainless Steel (304) Testing for 10 seconds.



Amplified Figure of Ni Content as 0.108% in Stainless Steel

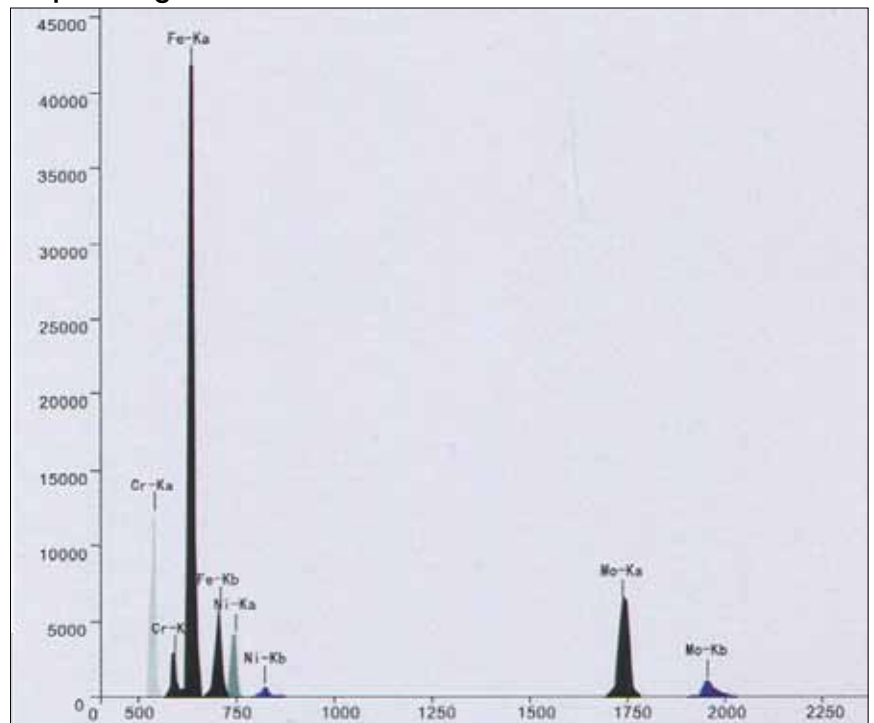


Figure of Stainless Steel (316) Sample

Sample	Cr	Mn	Ni	Cu	Mo
<b>Average value</b>	18.232	0.926	8.072	1.236	0.288
<b>Standard Deviation</b>	0.072	0.055	0.086	0.043	0.008
<b>Relative Standard Deviation (%)</b>	0.395	5.936	1.067	3.506	2.693

### Alloy Testing Advantages

- Rapid nondestructive testing. 1-2secs for rapid detection. More than 10secs for precise detection, whose results are similar to the results gotten in lab
- Professional alloy analysis software, which is easy for operation by commons. Free switch between Chinese and English interface.
- Multiple alloy analysis modes, including "quantitative analysis (ppm)", "qualitative analysis" etc. Built-in multi-calibration methods can calibrate deviation caused by different geometric states
- Unique adjustable fundamental parameter technology provides more analytical modes and more precise modes for customers.
- Dynamic information-match function displays testing results, sample numbers, and matching information on the interface simultaneously, which can be switched between each other.



EDX-POCKET4-9

## EDX-POCKET4-9, Heavy Metals in Soil Handheld Analyzer

### Performance Advantage

#### Perfect performance as desktop

Small power integral end-window miniature X-ray tube, large dimensional beryllium window Silicon Drift Detector (SDD, the best detector in the world), and miniature digital signal multi-channel processor, greatly reduce the testing time and testing deviation, and improve the testing precision, requiring similar performance as the desktop.

#### Small & light body, easy for carry

Operation of on-site and in-situ detection at anytime or anywhere.

#### Rapid & nondestructive detection

1-2secs for rapid detection, More than 10secs for precise detection, whose results are similar to the results gotten in lab, No destruction to samples.

#### Detection of light elements

Helium-charging system (optional) greatly expands measurable range (analyze elements from Mg), satisfying the requirements of customers for light elements detection.

#### HD camera for convenient observation

Observation of testing position at any time.

#### Direct testing

It can directly analyze on the surface of the sample, without needing of preparing samples.

#### Professional software for easy operation

It is equipped with professional alloy analysis software. Combining FP with EC software, it is easy for operation and acquiring wider application fields.

#### Simple deviation calibration

Built-in intensity calibration method ensures simple deviation calibration caused by different geometry shapes and none homogeneous structure density.

#### Faster data transmission

Built-in system, HD touch screen (resolution 640x480), digital multi-channel technology, and SPI data transmission technology, effectively accelerate the data transmission and improve counting ability.

#### Powerful battery & convenient charging

Compliment away two Lithium batteries (7800mAh), it can continuously work for 8 hours all together. It is convenient for charging because of wide voltage AC charger and Onboard charger.

#### Simultaneously testing elements

It can detect the elements such as Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Cd, Sb, Hg, Pb. And it can detect more elements according to the customers' requirements.

#### Multiple safety protection, caring for health

Automatically shut-down of X-ray light tube within 2 seconds with no sample in testing; the radiation level is far lower than the international safety standard; compliment away test safety cover.

#### Multiple protections

Waterproof and dust proof function provide the ability of working under high temperature and humidity. Its body is manufactured with high strength military material, which is moisture proof, shockproof, and pressure resistant.

**Applications in Environmental Protection**  
EDX-POCKET-IX is applied for in-situ testing and repair analysis in soil pollution. It features the characteristics of small & light body, which can be held in hands by common people when measuring. It has been widely applied in various kinds of geologies. Testing samples include slag, rock, soil, mud, with forms of solids, liquids, dust, etc.

### Application Advantages for Heavy Metals

- Applied for soil pollution testing caused by mercury, cadmium, lead, arsenic, copper, zinc, nickel, cobalt, & vanadium
- Detecting & mapping pollution areas
- Rapid discovering and solving abnormal conditions
- Rapid tracing of abnormal pollution and effectively searching and circling pollution areas
- Rapid on-site & in-situ testing of heavy metals in soil
- Rapid classifying various kinds of residential lands, commercial lands and industrial lands into 3 levels, named level 1, level 2 and level 3
- Connection of PDA to GIS system for drawing maps
- Equipped with digital multi-channel technology, it operates more rapid qualitative and quantitative analysis. Designed with high statistical counting rate, it greatly improves the stability of the instrument which is much more important for heavy metals testing, because of the low content of heavy metals in soil.
- Outstanding resolution greatly reduces the interference of arsenic and iron to lead and nickel. Its extremely low detection limit perfectly fits to heavy metals detection for environmental protection.





### Application Cases:

**1. Heavy metals detection in soil**  
Simply trigger the instrument, and you will know the trace metal elements in soil.

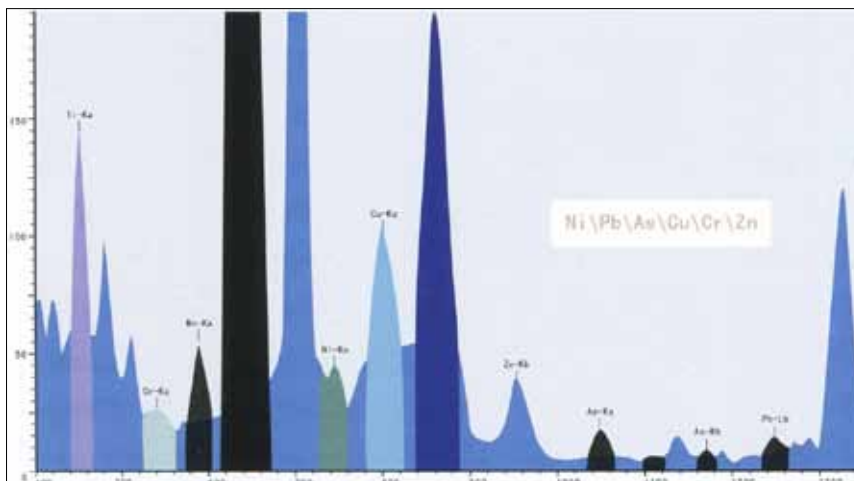
**2. Emergency treatment after heavy metal pollution**

Can quickly on-site trace the pollution and circle the polluted boundary.

**3. Screening of heavy metals polluted samples in large amounts**

The fourth generational handheld EDX-POCKET-IX can circle the key pollution areas in very short time, for key management.

Can rapidly distinguish the polluted areas and non-polluted areas .It improves the screening and productive rate integrally, & greatly reduces the cost of chemical examination and transportation.



The figure of sample testing for 30 seconds

### Analytical Precision: Measuring precision of main elements in GBW07425 testing for 30 seconds.

Sample	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	As	Se	Sb	Hg	Pb	Cd
07425_1	3811	73	52	566	2.95	10	26	25	63	6	0	1	0	26	0
07425_2	4056	72	54	541	2.95	9	28	18	72	5	0	0	0	28	0
07425_3	3724	68	45	555	2.92	11	28	25	69	8	0	1	0	20	0
07425_4	3980	51	65	602	2.94	12	29	27	70	7	0	0	0	26	0
07425_5	4036	62	51	580	2.95	10	28	29	75	5	0	0	0	27	0
07425_6	4044	75	55	564	2.95	14	25	16	64	5	0	0	0	25	0
07425_7	3794	63	58	575	2.97	14	30	26	70	5	0	0	0	24	0
<b>Average value</b>	3939	65	55	570	3.00	12	28	24	70	6	0	0	0	25	0
<b>Standard deviation</b>	144	9	7	21	0	2	2	5	4	1	0	0	0	3	0
<b>RSD/%</b>	3.64	13.14	12.28	3.72	0.51	17.71	5.98	22.32	5.19	22.79	0.00	244.95	0.00	11.31	0.00

### Performance index:

Models	EDX-Pocket-III/V/VII/IX
<b>Measuring range</b>	Mg to U
<b>Processor and RAM</b>	CUP: 667MHz RAM:256M Maximum expanded storage: 32G Standard configuration: 2G , for storage of large amounts of data
<b>Analytical Range</b>	ppm-99.99%
<b>Testing time</b>	3-30 seconds
<b>GPS, WIFI</b>	Built-in GPS & WIFI system
<b>Battery</b>	Chargeable lithium battery, with capacity of 7800mAh, continuously providing 8 working hours; Equip with wide voltage (110V-220V) general adapter
<b>Testing object</b>	Solid, liquid, powder
<b>Detector</b>	25mm <sup>2</sup> ,SDD
<b>Detector resolution</b>	Minimum resolution: 139eV
<b>Excitation source</b>	Target: Ag High voltage: 5-40kv Tube current: 1-100 μA
<b>Collimator and filter</b>	Collimator kinds: 2 (4.0mm & 2.0mm dia.) Filter types: 6 Automatic switch: YES
<b>Video system</b>	CMOS HD camera
<b>Screen</b>	Semi-transmission & semi-reflection LCD touch screen, resolution 640x480
<b>Detection limit</b>	Detection limit: ppm level
<b>Safety</b>	Self-contained password administration
<b>Testing window</b>	Ø12mm
<b>Gas charging system</b>	Optional Helium charging system
<b>Operational environment</b>	Humidity ~90%
	Temperature: -20°C~+50°C
<b>Size</b>	234x306x82mm(LxHxW)
<b>Weight</b>	Net weight:1.6kg Battery: 0.3kg



## EDX-POCKET4-7, Handheld Mineral Analyzer

The new generational EDX-POCKET-VII Series are designed according to the applications of on-site X-ray analysis in the wild, featuring small and light body, which can be held in hands by common people when measuring. It is super small, super light, super beautiful, super safe, super convenient, super long standby time, super waterproof, super precise and super fast. Digital multi-channel technology make the instrument have better detection limit, better stability, and wider application fields.

This Series of products has passed strict testing and inspection, and all index are accorded with the related technological requirements, reaching the international advanced level.

### Performance Advantage

#### Perfect performance as desktop

Introducing three core technology of small power window integrated miniature X-ray tube, large dimension beryllium window electric-cooling SDD detector (the best detector in the world), and miniature digital signal multi-channel processor, greatly reduce the testing time and test deviation, and improve the detection precision, which make it have the similar performance as the desktop.

#### Small body, easy to carry and operate

Small body. Easy to carry. Convenient for wild work. Can operate on-site and in-situ analysis at anytime or anywhere.

#### Nondestructive detection

No destruction to samples.

#### Fast detection

Instrument not only can operate fast detection with handheld type within 1-2 seconds, but also can operate longtime precise detection with desktop type, having the similar precision as the laboratory detection after 10 seconds.

#### Newly added light elements detection function

Compared to handheld X-ray fluorescence analyzer of the third generation ,it is added the gas charging system, which can charge helium at ordinary pressure .Thus it can detect the elements from Mg, greatly expanded the detecting range of elements, satisfying the requirements of customers according to light elements detection.

#### Direct testing

It can detect the sample directly, no need of samples. It can analyze various kinds of samples, including electronic products, alloy samples, geological and mining, soil, rock, residues, small solid particles, liquid sediments etc.

#### HD camera, more accurate testing

Built-in HD camera, can observe the testing position at any time, which is very important of mineral sample testing.

#### Easy for calibration of deviation

Multi-testing modes installation & free adding of infinite modes, coordinating with automatic testing mode matching functions, it achieves the easy test for one key. Built-in intensify calibration methods, it can calibrate the deviation caused by different geometry shapes & none homogeneous structure density.

#### Professional software, easy to operate

RoHS elements analyzer, alloy analyzer, mineral analyzer, & heavy metals in soil analyzer all are installed with professional software. Brand new software interface and core, combined FP with EC, it has wider application fields.

#### The collimator filter, improving 3 times of efficiency

On the basis of the combination of collimator and filter, increase them from 4 groups to 12 groups, increasing 3 times.

#### Faster data transmission

Embedded Window CE system, HD touch screen (resolution 640x480), digital multi-channel technology, and SPI data transmission, effectively improve the data transmission ability and counting ability, mastering testing data in every environment.

### Radiation protection, care for health

Triple safety protection function, automatic sensation, automatically shut-down of X light pipe within 2 seconds with no sample in testing; The radiation level is far lower than the international safety standard when working, with no radiation leakage; accompanied with test safety cover.

### Strong power, convenient to charge

Lithium battery, with maximum capacity of 7800mAH, can continuously work for 8 hours, whose endurance are 2 times longer compared to last three generations .And equip with wide voltage ac charger or vehicular charger ,which ensure the test at any place or any time.

### Warning instructions prevent for mistaken operation

Equipped with warning instruction system, green light flashes when the power is on and the yellow light flashed when testing, which prevent for mistaken operation.

### Multiple protection and durable

The instrument has waterproof and dust proof function and can continuously work under high temp. and humidity. Its protection boxes are manufactured with high strength military material, which enjoy with well moisture proof, shockproof, and pressure resistant functions.

**Performance index:**

Index	Description
<b>model</b>	The 4 th generation EDX analyzer-EDX-POCKET Series
<b>Analysis method</b>	Energy dispersive X-ray fluorescence analysis method
<b>Measuring range of elements</b>	Mg to U
<b>Simultaneously detect elements</b>	Simultaneously detect tens of elements
<b>Processor and RAM</b>	CUP: 667MHz, RAM:256M , Maximum expanded storage: 32G, Standard configuration: 2G , can store large amounts of data.
<b>Content range</b>	ppm~99.99%
<b>Testing time</b>	3-30 seconds
<b>GPS, WIFI</b>	Built-in system
<b>Battery time</b>	Lithium battery, which can be charged, with maximum capacity of 7800mAH, can continuously work for 8 hours; Equipped with wide voltage (110V-220V) general adapter, can work under alternating current
<b>Testing object</b>	Solid, liquid, powder
<b>Detector</b>	25mm <sup>2</sup> 0.3mil, SDD detector
<b>Detector resolution</b>	Lowest resolution can be 139eV
<b>Excitation source</b>	40KV/100uA-Ag anode window miniature X light tube and high voltage source
<b>Collimator and filter</b>	Collimator of 4.0 or 2.0 diameter, automatic switch of 6 types filter groups. 12 kinds of groups, world's most compound mode, can satisfy various kinds of samples testing
<b>Video system</b>	HD camera
<b>Screen</b>	TFT-LCD touch screen, resolution 640x480
<b>Detection limit</b>	Lowest detection limit accounts to ppm level
<b>Testing window</b>	12mm
<b>Safety</b>	Self-contained password manager mode
<b>Gas charging system</b>	Helium charging at ordinary pressure system
<b>Data transmission</b>	Digital multi-channel technology, SPI data transmission, quick analysis, high counting rate, waterproof miniature USB, which can be connected to desktop computer
<b>Humidity</b>	≤90%
<b>Temperature</b>	-20°C ~ +50°C
<b>Size</b>	234×306×82mm (L×H×W)
<b>Weight</b>	1.9Kg (with battery), 1.6Kg (without battery)

Mineral exploration industry is at the stage of low successful investing rate, upmost risks, & uncertainly profit returns, which brings high risks to investment. With the changes of China's mineral resources detection and mining work strategy from denotative development in the past to connotative development, the government begins to attach importance on effective investment of mineral exploration, promoting the diversification of investment, and reduces the financial investment while encouraging commercial mineral exploration and development.

The framework of China's commercial mineral resources exploration industry has been formed primarily, and the mining right system has been improved gradually .The market is forming and the commercial mineral exploration activities are beginning, which greatly strengthen the exploration and investigation on

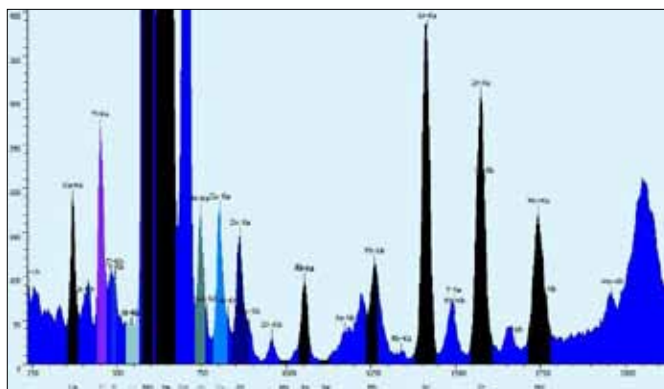
mineral industry. However, to these mineral companies, unlike the national geology exploration bureau, the tools for exploration are not that complete, which restrict the development of these companies if chemical titration method is still used for sample testing, which are with low efficiency and many errors because of human operating.

However, the various analyzers produced by MRC can help the mineral exploration for these companies, improving efficiency, precision, and reducing testing time, which greatly promote the development of mineral exploration.

EDX-POCKET-VII is applied for mineral exploration, in situ testing analysis, & soil content analysis. With the features of small, light, quick analysis, high precision and handheld, it has been widely applied for element sample testing and analysis of various ores and slag. Samples include all natural ores, slag, rocks, soil, slurry from sulfur to uranium, with forms of solid, liquid, and powder.

- Quick category of ore samples. Auto multi-element qualitative and quantitative analysis. Various ore samples choosing and free adding of infinite samples
- Built-in intensified calibration methods, can calibrate the deviation caused by different geometric states and uneven structure density.
- With GPS function, applied in geological exploration and mineral in-situ testing, it can record the data into GPS. In the wild, it can search the satellite signal at any time, recording the longitude, latitude, altitude, and satellite number when testing, and save these data accompanied with the test report.
- It can quickly test a big range of mining area, effectively detect the land belt mode, and survey and map the distribution of ores and mines, doing help for mining rich mineral area in primary.
- Test raw ore, concentrate, and tails when washing the ores.
- Determination of the raw ores & concentrates when purchasing
- Determination of light elements, such as Mg, Al, Si, P, S etc
- Equipped with HD camera, can directly visual requested detection of mineral vein and mineralized points.

- **Geological soil detect**  
Simply trigger the instrument, knowing the trace metal element content.
- **Application of finding ores in the wide**  
Can quickly on-spot follow the abnormalities of mineralization and circle the boundary of ore body. According to the low grade industrial requirements, it can simply get the grade conclusion of boundary. It also can scan and analyze the rock core samples.
- **Mine project analysis**  
The fourth generational handheld Genius 7000 can circle the core mineral vein in very short time for key mining and can quickly tell the grades of ores, sub prime ores, and non-ores. It also can improve the productive rate of the mine and greatly reduce the expenses of chemical examination & transportation.



### Analytical Precision:

#### Measuring Precision of the Main Elements in International Polymetallic Nodule Sample Testing for 30 Seconds.

Sample	Ti	V	Mn	Fe	Co	Ni	Cu
07249-1	1.027	0.055	20.85	18.75	0.352	0.347	0.267
07249-2	1.052	0.053	20.85	18.76	0.351	0.350	0.249
07249-3	1.066	0.055	20.89	18.72	0.347	0.354	0.265
07249-4	1.024	0.054	20.89	18.74	0.347	0.337	0.280
07249-5	1.035	0.058	20.85	18.71	0.359	0.346	0.261
07249-6	1.032	0.053	20.86	18.76	0.350	0.344	0.273
07249-7	1.056	0.057	20.85	18.70	0.353	0.353	0.275
<b>Positive Value</b>	1.043	0.059	20.92	18.71	0.350	0.360	0.280
<b>Average Value</b>	1.042	0.055	20.862	18.734	0.351	0.347	0.267
<b>Standard Deviation</b>	0.0161	0.0018	0.0195	0.0244	0.0039	0.0059	0.0104
<b>RSD/%</b>	1.55	3.35	0.09	0.13	1.12	1.71	3.88

Sample	Zn	As	Pb	Ca	Sr	Zr	Mo
07249-1	0.056	0.018	0.097	2.020	0.122	0.064	0.037
07249-2	0.056	0.018	0.096	2.063	0.122	0.064	0.037
07249-3	0.055	0.018	0.097	2.050	0.123	0.064	0.037
07249-4	0.054	0.018	0.100	2.074	0.121	0.065	0.038
07249-5	0.055	0.018	0.098	2.040	0.120	0.063	0.037
07249-6	0.055	0.018	0.096	2.062	0.122	0.064	0.037
07249-7	0.056	0.017	0.083	2.072	0.122	0.063	0.037
<b>Positive Value</b>	0.057	0.018	0.095	2.010	0.120	0.065	0.037
<b>Average Value</b>	0.055	0.018	0.095	2.054	0.122	0.064	0.037
<b>Standard Deviation</b>	0.0007	0.0003	0.0058	0.0193	0.0010	0.0005	0.0005
<b>RSD/%</b>	1.29	1.89	6.05	0.94	0.80	0.79	1.45

Apparatus is used to determine the Heat Deflection Temperature or the Vicat Softening Point. All the specimens are charged with a constant load and immersed in a bath, where temperature is increased at a standard velocity. The attained heat resistance rate of plastic materials is a widely required parameter for product characterization, for quality control, as well as for evaluating their conformity to the previewed applications.

The optional software system enables to produce graphs showing the deformation of each specimen & temperature increase versus time. This tester may be used for tests conforming to the following standards: ISO 75, ISO 306, ASTM 0648, ASTM 01525, G81T 1633, G81T 1634. Housing made of steel. Stainless steel inner bath. The designed volume ensures a very good thermal exchange.

#### Technical Parameters:

Operating temperature: ambient temperature to 300°C • Heating rate: (120±10) °C/h or (50±5) °C/h • The Max Temperature Error: ±0.5°C • Distortion Range: -0.1 mm >- 1.1 mm • The Max. Distortion Error: 0.01 mm • Test Stations: 2, 3, 4, 6 • Heating Medium: methyl silicon oil • Power Supply: 110V/220V 60HZ/50HZ.



**HDT-300B4**

#### HDT-300B Series

Touch Screen Display.

Test stations: 2,4,6.

Enables to produce graphs showing the deformation of each specimen and temperature increase versus time.

Temp. Measuring point: one.



**HDT-300M4**

#### HDT-300M Series

LED Display

Test stations: 2, 4, 6

Temp. Measuring point: one.



**HDT-300C4**

#### HDT-300C Series

Touch Screen Display.

Test stations: 2, 4, 6.

Enables to produce graphs showing the deformation of each specimen and temperature increase versus time.

Temp. Measuring point: one each station.

## MFI-400 Series, Melt Flow Indexers

This type of Melt Flow Indexer is a new & affordable tabletop instrument that tests the melt mass-flow rate (MFR) & melt volume-flow rate (MVR) of a wide range of thermoplastic raw materials, in the form of granules, strips of film etc. This test method is particularly useful for quality control tests on thermoplastics. MVR will be found particularly useful when comparing materials of different filler content & when comparing filled with unfilled thermoplastics. The MFR can be determined from MVR measurements provided the melt density at the test temperature & pressure is known. The tester is far superior to all national and international standard of Melt Flow Rates requirements, including ISO1133, ASTM D1238 & GB/T 3682 method A & B. High Accuracy The built-in microprocessor maintains temperature control to within  $\pm 0.5^\circ\text{C}$ , with rapid ramp-up to the set point. Extruded material is automatically cut off by the built-in scraper mechanism at preset intervals, controllable to  $\pm 0.1$  second. Ease to operate! Testing Melt Flow Rate has never been so economical or easy to do! The tester is supplied completely with the accessories & weights necessary for maintenance & operation. Nothing else to buy—just plug it in & start a test.

**Technical Parameters:** Operating temperature:  $120^\circ\text{C}$ – $450^\circ\text{C}$  • Temperature control accuracy:  $\leq 0.5^\circ\text{C}$  • Temperature display resolution:  $0.1^\circ\text{C}$  • Temperature rising time:  $<30$  min • Power supply: 220V/50Hz or 110V/60Hz.



It allows for testing melt mass-flow rate (MFR) according to the standards ISO1133, ASTM 01238 method A. The clear multi-line LCD display & tactile-feedback membrane keypad allows fast, accurate inputting of test parameters and providing continuous display of settings during testing.



It allows for testing the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) according to the standards ASTM 01238, ISO1133, with the additional function of printing the test result by a built-in micro-printer.

## MFI-400C Series

**MFI-400C Software:** Two languages are provided: English and Chinese. MFI-400C Software has the functions of setting parameters, constant temperature control, cutting sample, calibration, setting test time, displaying test datum & result, calculating melt density, as well as checking & printing test datum. Password verify is necessary for some main operations in case of mishandle.



### MFR and MVR, Loading the Weight Automatically

It allows for testing the melt mass-flow rate (MFR) and melt volume-flow rate (MVR), Melt density test according to the standards ASTM 01238, ISO1133. The clear multi-line Touch screen allows fast, accurate input of test parameters and providing continuous display of setting during testing, printing the test result by a micro-printer. With the additional function of loading the Weight automatically.



### MFR and MVR, Loading the Weight Manually

It allows for testing the melt mass-flow rate (MFR) & melt volume-flow rate (MVR), Melt density test according to the standards ASTM 01238, ISO1133. The clear multi-line Touch screen allow fast, accurate input of test parameters and providing continuous display of setting during testing, with the additional function of printing the test result by a micro-printer.

### MFR and MVR, Loading the Weight Manually

It allows for testing the melt mass-flow rate (MFR) according to the standards ASTM 01238, ISO1133. The clear multi-line Touch screen allows fast, accurate input of test parameters and providing continuous display of setting during testing.

## QG-1 Series, Metallurgical Specimen Cutter



Specimen cutting is the first step during metallurgical sample preparation. QG-1 adopts high speed rotating thin grinding wheel to cut specimen, & it is equipped with cooling system to prevent the heat damage during cutting. The operation of QG-1 is awfully easy & the maintenance is extremely convenient.

Model	QG-15	QG-13
<b>Max. sample section</b>	50 x 50 mm	35 x 35 mm
<b>Grinding wheel size</b>	φ300 x 2 x φ32 mm	φ250 x 2 x φ32 mm
<b>Rotate speed</b>	2800 r/min	
<b>Electromotor</b>	Y90L-2, 2.6KW, 380V, 50Hz	Y802-2, 1.2KW, 380V, 50Hz
<b>Dimensions</b>	740 x 465 x 390 mm	650 x 400 x 350 mm
<b>Net weight</b>	70Kg	55Kg

## Q-3A, Metallurgical Specimen Cutter



Q-3A is suitable for cutting the specimens of metal and rock materials, which facilitates the observation of metallographic and rock structure. Q-3A is equipped with cooling system that can cool down the specimen during cutting so as to prevent overheating and damaging. The operation of Q-3A is awfully easy and the maintenance is extremely convenient, it is an indispensable device for the factories, research institutions and college labs to prepare metallurgical specimen.

### Technical specification:

- Max. Cutting Width: 60mm
- Max. Cutting Height: 80mm
- Max. Cutting Diameter: cp50mm
- Specifications of Abrasive Wheel: 250 x 2 x 32 mm
- Weight: 130kg

## Q-5/Q-5A, Metallurgical Specimen Cutter



Q-5 & Q-5A is used to chiefly cut the specimen with cylinder-shaped, multi-angular and ordinary metallurgical specimens with convex space. With a double-cover fully-sealed structure and double clipping clamp structure, which can guarantee the absolute safety under the state of cutting. Equipped with double deck stage, the cutting speed can be controllable. What is more, it is installed with a strongly cooling system so as to avoid the damages to the structure of the specimen caused by over-heating during cutting operation, thus enlarging the cutting space while avoiding the hurt to the specimen surface. With the above-mentioned merits on both operation and maintenance, it is an excellent machine to cut the specimens with irregular shaper.

### QG-5 Technical specifications:

- Maximum cutting section: 120x120mm
- Rotary cutting speed: 2800r/min
  - Cutting disk size: φ400 x 3 x φ32mm
  - Cutting power: 4KW/380V/50Hz
  - Machine Dimensions: 760x850x1400mm
  - Net weight: 380Kg.

### QG-5A Technical specifications:

- Maximum cutting section: 100x100mm
- Rotary cutting speed: 2800r/min
  - Cutting disk size: φ350 x 2.5 x φ32mm
  - Cutting power: 4KW/380V/50Hz
  - Machine Dimensions: 800x660x1380mm
  - Net weight: 315Kg.

## Q-100B/Q-80Z , Auto Metallurgical Specimen Cutter



- LCD displays all the cutting data.
- The diameters of specimens to be cut range from 5 to 8mm (1008:100mm) and the cutting capacity reaches 100x200mm.
- Manual cutting and automatic cutting can be changed over at random.
- Large cutting chamber & tempered-glass view window.
- Non-burnt movable cutting mode which greatly improves cutting quality.
- Automatic retract at the end of cutting operation.
- Dual-direction feed which increase the depth of cutting.

Model	Q-80Z	Q-100B
Power supply	3 phases/4 wires; 380V/50Hz	
Rotary cutting speed	2100 rpm	
Cutting disk size	350mm x 2.5mm x 32mm	
Max. Cutting diameter	Φ80mm	φ100mm
Max. Cutting capacity	80mm x 200mm	100mm x 200mm
Motor power	22.2KW	23KW
Dimensions of cutting table	310mm x 280mm	
Overall dimension	930x700x610mm	

## MP-1B/MP-2B, Metallurgical Specimen Grinder/Polisher

MP-18 and MP-28 can be used for coarse grinding, fine grinding, rough polishing and fine polishing. It is the perfect metallographic specimen machines for the metallurgical specimen preparation.



### Single disc Polisher/Grinder MP-1B

#### Technical Specifications

- Diameter of grinding disc: 230mm
- Diameter of polishing disc: 200mm
- Rotation speed of grinder/polishing disc: 50-1000rpm
- Power: 250W /220V 150Hz
- Dimension: 615x380x270mm
- Net weight: 30Kg



### Double disc Polisher/Grinder MP-2B

#### Technical Specifications

- Diameter of grinding disc: 230mm
- Diameter of polishing disc: 200mm
- Rotation speed of grinder/polishing disc: 50-1000rpm
- Power: 550W / 220V 150Hz
- Dimension: 690x715x310mm
- Net weight: 45Kg



By change the grinding/polishing disc, MP-1S single disc polisher/grinder can be used for coarse grinding, fine grinding, coarse polishing and fine polishing MP-1S operates steadily in low noise, easily change speed and grind/polish units.



MP-1

#### MP-1, Single Disc, Dual Speed Metallurgical Specimen Preparation Grinder/Polisher With Polishing Head

##### Technical Specifications:

- Grinding disc diameter: 250mm
- Sand paper diameter: 230mm
- Polishing disc diameter: 220mm
- Abrasive disc diameter: 220mm
- Rotation speed: 500/1000rpm
- Power supply: 380V/50Hz
- Dimension: 360x480x680
- Net Weight: 70Kg



MP-1S

#### MP-1S, Single Disc, Stepless Speed Metallurgical Specimen Preparation Grinder/Polisher With Polishing Head

##### Technical Specifications:

- Grinding disc diameter: 250mm
- Sand paper diameter: 230mm
- Polishing disc diameter: 220mm
- Abrasive disc diameter: 220mm
- Rotation speed: 500-1000rpm
- Power supply: 220V/50Hz
- Dimension: 360x480x680
- Net Weight: 70Kg



MAPAO200M3/M5

#### MAPAO200M3/M5, Single Disc, Stepless Speed Automatic Specimen Metallurgical With Polishing Head

- Applying high-intensity FRP shell, rugged durability.
- Adopting low-noise high-torque brushless motors, operate smoothly.
- Sophisticated rotary balance, to ensure the plainness of specimen.
- Leak-proof design of Main spindle, bearing durability.

##### Technical Specifications:

- Grinding/polishing disc diameter: 200mm.
- Rotation speed: 0-600rpm.
- Power supply: 250W/220V/50Hz.
- Inlay molds: 3ENEA available; diameter: cp25 / cp30mm.
- Cooling pipe: 1 PC.
- Dimension: 350x440x540 mm.
- Net Weight: 60Kg.

## MOPAO2DE/260E/160E, Medium Speed Metallurgical Specimen Grinder/Polisher With Polishing Head

- This grinder polisher is the most economical and applied machine for metallographic specimens. Full Series of styles can fit multiple specimen preparation.
- Designed & manufactured according to international advanced methodology & qualification of metallographic specimens.
- Equipped with beautiful and applied glass fiber crust; pure stainless steel, rustless forever.
- Two optional styles equipped with diameter of 200mm, 250mm, and disk respectively.
- Both of style of single-disk and double-disk equipped with stepless speed change and multiple-step constant speed system.
- E-style machine equipped with stepless speed change and dual step constant speed system simultaneously, and can be switched each other. The turnaround of plates can be selected.



Model	Plate number	Diameter of plate	Rotate speed	Remark	
MoPao 160	1	200/250mm	150/300 (dual-speed)	380V/50Hz, 3 phases	
MoPao 260	2				
MoPao 300	1	300mm	50-600 (stepless speed change)	220V/50Hz	
MoPao 160E	1	200/250mm			
MoPao 260E	2	200/250mm			
MoPao 300E	1	300mm			
MoPao 2DE	2	200/250mm	150/300	380V50Hz; 3 phases	2 motors; isolative control system
MoPao 2D	2			220V/50Hz	

## SAD-11, Abrasive Band Grinding Machine (Double Abrasive Band)



SAD-11 apply abrasive band to grind and polish the specimen for spectral measurement, different bonds can be replaced timely, conveniently and easily.

### Technical specifications:

- Roller center distance: 255mm
- With cooling water device
- Abrasive band: width 100mm, perimeter 920 mm
- Rotation speed: 1400r/min
- Power supply: 550W / 380 V 150Hz
- Dimension: 550x600x310mm

In metallographic testing laboratory, it is the indispensable procedures about sample's pre-rubbing, grinding and polishing during the cause of metallographic sample preparation.

YMP-2 Series of grinder/polisher is developed and designed after extensive market surveys in many aspects and absorb users' requirements. It's a newly developed product with novel appearance. It starts steady with high-speed and low noise and it can meet different specimen preparation requirements.

It can improve the quality of grinding, polishing and preparing efficiency of the specimen.



YMP-2

#### YMP-2, Dual-Disc-Stepless-Speed Metallurgical Preparation Polisher/Grinder

##### Technical Specifications:

- Diameter of grinding disc: 250mm
- Diameter of sand paper: 230mm
- Diameter of polishing disc: 220mm
- Rotation speed: 50-1400r/min
- Power: 350W/220V/50Hz ; 350W/110V/60Hz
- Dimension: 700x610x330mm
- Net weight: 80Kg



YMP-2A

#### Dual-Disc-Four-Speed Metallurgical Preparation Polisher/Grinder YMP-2A

##### Technical Specifications:

- Diameter of grinding disc: 250mm
- Diameter of sand paper: 230mm
- Diameter of polishing disc: 220mm
- Grinding speed: 500 /1000 r/min, 300/600 r/min
- Power: 370W/380V/50Hz
- Dimension: 700x610x330mm
- Net weight: 80Kg



YMP-2B

#### Dual-Disc-Dual-Speed Metallurgical Preparation Polisher/Grinder YMP-2B

##### Technical Specifications:

- Diameter of grinding disc: 250mm
- Diameter of sand paper: 230mm
- Diameter of polishing disc: 220mm
- Grinding speed: 500,1000r/min,
- Power: 550W/380V50Hz
- Dimension: 700x610x330mm
- Net weight: 80Kg



XQ-1

### XQ-1, Manual Mechanic Mounting Press

XQ-1 is manual mechanic mounting press with 3 different size of mounting mould, the temperature and heating time can be setup and shown manual on the panel.

#### Technical specifications:

- Mould diameter:  $\phi$ 22mm;  $\phi$ 30mm;  $\phi$ 45mm
- Input voltage: 220V/50Hz; 110V/60Hz
- Power: Max. 650W
- Dimension: 340x260x430mm
- Weight: 33kg



ZXQ-1

### ZXQ-1, Automatic Mounting Press

Mounting press is used for inlay the irregular metallurgical specimens. ZXQ-1 is an auto-machine, it can setup with the heating temperature, mounting time and force.

#### Technical specifications:

- Mould diameter:  $\phi$ 22mm;  $\phi$ 30mm;  $\phi$ 45mm
- Voltage: 220V50HZ; 110V/60HZ
- Power: Max.1000W
- Pressure: 0-2MPa
- Temperature: 0-300°C
- Mounting time: 0-99 minutes and 0-59 seconds can be setup
- Dimension: 380x350x420mm
- Weight: 100Kg
- Automatic/Manual operation is available



ZXQ-5

### ZXQ-5, Automatic Mounting Press

Mounting press is used for inlay the irregular metallurgical specimens. ZXQ-5 is an auto-machine, it can setup with the heating temperature, mounting time and force. Four different size of mould is available for mounting, and it can inlay two specimens simultaneously.

#### Technical specifications:

- Mould diameter:  $\phi$ 25mm;  $\phi$ 30mm;  $\phi$ 40mm;  $\phi$ 50mm
- Voltage: 220V50HZ; 110V/60HZ
- Power: Max.1800W
- Pressure: 0-2MPa
- Temperature: 0-300°C
- Mounting time: 0-99 minutes and 0-59 seconds can be setup
- Dimension & Weight: 615x510x500mm & 110Kg
- Cooling system: By water



QC-601

**QC-601 Series, Manual Thermo Press Forming Machine**

Put the plastic (or rubber) material inside the casting mold, in between the upper & lower heating plate, implement pressure and temperature, to form the material into a standard shape to be a sample to serve for test, or to be an example of color comparison, also to be example before mass-production.

Model	QC-601
Pressure	10, 30/50ton
Temperature	Normal atmospheric temperature ~ 300°C
Timer	0 ~ 999Min.
Size of Heating-plate	300×300mm
Distance between heating-plates	84mm Max.
Cooling method	Cooling water, recycling around upper mold and lower mold, force the mold and specimen cool down
Attachment	forming mold for specimen, one set.
Dimensions (mm)	470×620×1280
Weight	230kg
Power source	single phase. 220V/50HZ or 60HZ



SHORE A

SHORE C

SHORE D

**SHORE Series, Durometers**

SHORE A - widely used to test common rubber, complex rubber, soft rubber, elastomers, wax and so on.  
 SHORE D - widely used to test hard rubber, hard colophony, grass, plastic, print board, fibre & so on.  
 SHORE C - Durometer is suit for measuring the hardness of materials, which the pressure degree is 50%, the stress need above 0.5kgf/cm<sup>2</sup>, and many other similar hardness material.  
 It is widely used in testing various foam, sponge, microporous material and so on.

Model	SHORE A	SHORE C	SHORE D
Range	10~90 HA	10~90 HW	10~90 HD
Head dim.	Φ0.79mm	SR 2.5 mm	SR 0.1 mm
Head stroke	2.5 mm		
Dimension	115x60x25 mm		
Weight	0.5 Kgs		



HLX-AC

HLX-D

**HLX Series, Constant Load Test Stands**



SHR-150M

**SHR-150M, Manual Rockwell Hardness Tester**

SHR-150M is an effective and affordable Rockwell testing machine with high accuracy, reliability and durability, and it is applied in the workshops and measurement departments for determining the Rockwell hardness of ferrous and non-ferrous metals. SHR-150M adopts mechanical test cycle without any need of electricity, load force 60, 100, 150Kg is selected by dial knob, test force is manually loaded in handle, and tested result: HRA, HRB, HRC is showed on the analogue gauge.

Model	SHR-150M
Preliminary test force	10Kgf(98.07N)
Hardness analogue resolution	0.5HR
Max. Height of Specimen	170mm
Instrument Throat	140mm
Dimension (mm)	L520xW240xH700
Gross/Net Weight	120/90Kg
Accuracy	GB/T230.2; ASTM E-18; ISO6508



HT Series

### HT/HB Series Digital Torque Meter

HT Series Digital Torque Meter is an intellectualized measure instrument, which is specially designed for testing and measuring different of torque. HT is main used for kinds motorized or air screwdriver, torque screwdriver, torque wrench, torque driver, measure and calibrate torque testing, and parts fracture test.

It is widely applied in electric industry, machinery industry, light industry, automobile industry, scientific research and so on.



HB Series

### Specifications:

- High accuracy and resolution
- Peak hold function
- Peak automatic clearance function
- Tolerance limit (up and down limit)
- Automatic power off function
- 3 units available: N.m, kgf.cm, lbf.in
- Reset acceleration of gravity function
- Full range 150% overload
- Large memory
- Inductive background light
- USB output
- Match synchronous analysis software

Model	HT/HB-10	HT/HB-20	HT/HB-50	HT/HB-100	HT/HB-200
Capacity	1.0000N.m	2.0000N.m	5.00N.m	10.00N.m	20.0N.m
Resolution	0.0005N.m	0.001N.m	0.002N.m	0.05N.m	0.1N.m
Accuracy	±0.5%				



QC-619T

### QC-619T, Abrasion Tester

The main function is to use specified Grinding Wheel with specified Load to rub the surface of specimen, and after a setup number of timer of abrasive, evaluate the following conditions of the surface after test, and ratio the endurance characteristic of abrasion for this material.

- Worn out condition
- The loss of the weight
- The loss of the physical volume
- The thickness that been worn out, etc.
- Use NBS standard gum to ratio the endurance characteristic of abrasion for this material.

### Specification:

- Machine Dimension: 33 x 43 x 30cm
- Machine Weight: 30 kg
- Power Supply: 240V 50Hz
- Rotary Speed: 60RPM (Or to be specified)
- Counter: LCD display, 6Digit (Optional Setting), Auto-Brake
- Load (Weights) : 250g, 500g, 1000g (Free assorting by user)
- Grinding Wheel specification: (As customer specifies)
- The cleft between

Grinding Wheel and Specimen Plate-Holder: 37 ~ 38mm • Grinding Wheel: Diameter 2", thickness 1/2" • Pitch of Left and Right Grinding Wheel: 63.5mm • Specimen size: Ø100mm, center hole: Ø8mm, thickness: 0.5~3mm (Adjustable), available for soft/hard material • Accessories: Vacuum cleaner 1Set, Specimen cutter 1Pc (A), Wrench 1Pc (K), Grind Wheel 1Set (B), Sand Paper 5Pcs (C) • Attachment: Warranty Certificate, Instruction Manual each one piece.



**VB12, Φ300 Vertical Profile Projector Vexus**

**Applied-fields:**

Vexus VB12 Series digital measuring profile projector integrated optical, mechanical and electronic high efficiency measuring instrument. Image is the same direction with work piece, erect and direct viewing. It is widely use in the field of mechanic, electronic, rubber industry, and college, research institute and the measuring checking department for checking product quality. VB12 can inspect all kinds of surface and outline of 3 complicated work-pieces such as Template, Pressing work-pieces, Cam, Screw thread, Gear, etc.

**Characteristics:**

- Sturdy metal design with fashionable shape;
- Excellent optical path with sharp image: magnification error < 0.08%;
- Large travel stage with precise accuracy: 3+L/75;
- DRO DP300 with powerful measurement and process functions;
- Z-axis focus system adopts double rails lifting structure;
- Drawing, PC measurement report and SPC analyze Easily.

Model	Reverse image Obverse image	VB 12-1550 VB 12-1550Z	VB 12-2010 VB 12-2010Z
<b>Worktable</b>	Metal stage dimension	340x152mm	350x170mm
	Glass stage dimension	196x96mm	246x120mm
	Stage travel: X-axis	150mm	200mm
	Stage travel: Y-axis	50mm	100mm
	Stage travel: Z-axis	90mm(for focusing)	90mm(for focusing)
	Accuracy	≤3+L/75(um)	
Resolution of X and Y-scale:0.001mm			
<b>Screen</b>	Screen diameter: Ø312mm,effective range> Ø300(with * reticle)		
	Screen Rotary range of screen:0~360°		
	Resolution of rotary indication:1' or 0.01°		
<b>Objective</b>	Magnification	10x(std.) / 20x(opt.)	50x(opt.) / 100x(opt.)
	Object view-field	Ø30mm / Ø15mm	Ø6mm / Ø3mm
	Work distance	77.7mm / 44.3mm	38.4mm / 25.3mm
	Measuring height	90mm	
<b>Digital readout</b>	DP300 multifunction data processing system		
<b>Illumination</b>	Surface and Contour Illumination:24V/150W halogen lamp		
<b>Power</b>	AC110V/60Hz;220V/50Hz,400W		
<b>Cooling</b>	Forced cooling(3-axis-fans)		
<b>Dimension(mm)</b>		L800×W550×H1150	L800×W550×H1150
<b>Instrument net weight</b>		150kg	170kg

**Standard delivery:**

Main instrument with worktable; DRO DP100; 10X objective & transmitted mirror; mini-printer.

**Optional accessories:**

20x, 50x & 100x objective & mirror; footswitch; angle & radius over-chart; Rotary-table; measuring software; working cupboard.

**Recommended working cupboard: JT02B:**

Loading≥250kg, Dimension: L1000×W560×H800(mm).



UTM-503B1



SoftWare For UTM-501B1 UTM-502B1

## UTM-501B1/502B1/503B1, Computerized Universal Testing Machine

UTM-501B1 serial, apply to metal rod, concrete, fabric etc. Floor type, is more stable and convenient for operating. Strong structural & small volume, transmission efficiency more than 70%, less energy loss and high precision, operate easily, 501B1 & 502B1 could connect to computer.

### Specifications:

- The seal plates are treated by anode hardening, and the ball screws are equipped with dust-proof cover to extend its lifetime and precision. Hardware protection: Up/down limit, emergency stop button.
- Servo-motor driven, precise decelerators and ball screws is used to reduce the noisy, loss of transmission.
- LCD display screen can use to operate the machine without connecting with computer.
- Load Cell comply with ASTM-E4 standard which accuracy is limited within 1.0 % and adopt bridge circuit to sense the load force and export data. Load cell also includes memory lock to memorize various parameters. Machine can detects the parameter automatically when switching different load cells.
- With external I/O junction to expand functions
- Inching control.
- Various grips and extensometers are available.

### Function of Software:

- Data sampling rate: Max. 60Hz.
- Full-computerized control to run the test or Jog button control
- Compatible with Window XP or Vista system, but the memory requires 512MB.
- USB interface for bidirectional transmission
- Multi-curves display and real-time plot
- various unit of measurement are available
- Flexible form to manage database.
- Free to name the data file.
- Testing screen is selective to display data, graph or for both at the same time.
- Data processing: file saving, setting loading, report printing and data comparing.
- Graph display: strain v.s. elongation, strain v.s. time and so on.
- tensile test, compression test, bending test, peel test, adhesive test...
- Deformation of machine is revised automatically to ensure test data closing to the precise value.
- Software protection: Overload, over-displacement protection.

Model	UTM-501B1	UTM-502B1	UTM-503B1
Max. Capacity	300 KN (30,000 kgf)	200 KN (20,000 kgf)	100 KN (10,000 kgf)
Force resolution	1/10000	1/10000	1/10000
Travel resolution	0.005 mm	0.005 mm	0.005 mm
Speed	0.2~300 mm/min	0.2~300 mm/min	0.3~350 mm/min
Motor power	3.0kw	2.0kw	1.0kw
Speed accuracy	±0.5%	±0.5%	±0.5%
Motor style	AC servo motor	AC servo motor	AC servo motor
Testing Space	550 mm	550 mm	550 mm
Dimension	124x68x220(H) cm	120x65x220(H) cm	115x65x220(H) cm
Weight	950 kg	900 kg	800 kg
Power supply	3Ø200~240 V AC, 15A	3Ø200~240 V AC, 15A	1Ø200~240 V AC, 15A
PC-Port	USB	USB	USB
Data Sampling Rate	5K Hz	5K Hz	5K Hz
Optional accessories	UTM-TECH B1 Software Grips Extensometer UTM-515, UTM-558 PC	UTM-TECH software Grips Extensometer PC	-
Stroke(w/o grips)	1000 mm	1000 mm	1000 mm





UTM-505B1

**UTM-505B1, Universal Material Testing Machine**

Universal material testing machine are mainly applied to testing the physical features of raw materials, finished-products, and semi-products. Universal material tester can perform tensile testing, compression testing, bending testing and acquire testing data like elongation, extension rate, stress and strain...etc. Universal material testing machine can go with various testing accessories like grips, ovens, extensometers and load cells to perform various measuring & testing. This tensile tester can be operated individually or by computer to control the tester.

It's new floor type Universal Material Testing Machine which applied by latest design and producing skill to have strong structure, saving transmission power and electric current without specific power system. Undoubtedly we still keep the advantage for testing precision, simply operation, expand strong. It's the best choice for material testing machine.

**UTM-506B1, Material Testing Machine**

Material testing machines can analysis the whole testing result including elongation, stress, strain, break value and average value. It can also fit to different specimen shape or be required to destroy the specimen and record the entire testing process and analysis the physical features of the specimen like tension force, bending strength, wear-resisting, impact, torque force, abrasion, fatigue, hardness, peeling force, viscosity...etc. We also supply the specimen maker equipment like pneumatic specimen press, hardness specimen cutting device, electrical forming machine. These equipment can make the standard specimen to get precise result during test.

This is a new tabletop Material Testing Machine which applied by latest design and producing skill to have strong structure and lightweight. Undoubtedly we still keep the advantage for testing precision, simply operation, expand strong. It's the best choice for material testing machine. We have a Series B1 type: 503B1/505B1/508B1/513B1. The specification and function of them are the same expect external different.



UTM-506B1 (Extend)



UTM-506B1

Model	UTM-505B1	UTM-506B1	UTM-506B1 (Extend)
Max. Capacity	50 KN (5,000 kgf)	10 KN (1,000 kgf)	10 KN (1,000 kgf)
Force resolution	1/10000	1/10000	1/10000
Travel resolution	0.005 mm	0.005 mm	0.005 mm
Speed	0.5~500 mm/min	1~1000 mm/min	1~1000 mm/min
Motor power	750w	400w	400w
Speed accuracy	±0.5%	±0.5%	±0.5%
Motor style	AC servo motor	AC servo motor	AC servo motor
Testing Space	420 mm	350 mm	350 mm
Dimension	88x58x193(H) cm	72x51x132(H) cm	72x51x172(H) cm
Weight	356 kg	120 kg	140 kg
Power supply	1Ø200~240 V AC	1Ø200~240 V AC	1Ø200~240 V AC
PC-Port	USB	USB	1/10000
Data Sampling Rate	5K Hz	5K Hz	5K Hz
Stroke(w/o grips)	1100 mm	700 mm	1200 mm



UTM-508B1

Material testing machines can analyze the whole testing result including elongation, stress, strain, break value and average value. It can also fit to different specimen shape or be required to destroy the specimen and record the entire testing process and analyze the physical features of the specimen like tension force, bending strength, wear-resisting, impact, torque force, abrasion, fatigue, hardness, peeling force, viscosity...etc. We also supply the specimen maker equipment like pneumatic specimen press, hardness specimen cutting device, electrical forming machine. These equipment can make the standard specimen to get precise result during test.

### UTM-508B1, Material Testing Machine

It's a light type Material Testing Machine which applied by latest design and producing skill to have strong structure and lightweight. Undoubtedly we still keep the advantage for testing precision, simply operation, expand strong. It's the best choice for material testing machine. We have a Series B1 type: 503B1/505B1/506B1/513B1/. The specification and function of them are the same except external different.



UTM-513B1

### UTM-513B1, Universal Testing Machines

This is a new light type device which adopts latest design & skill to have strong but smaller & lighter structure. Still keep the advantages of testing precision, simply operation, extend strong. It is the best choice for small capacity.



UTM-508E

### UTM-508E, Material Testing Machine

This light type Material Testing Machine which takes newest designed concept and technology to be the smallest and lightweight. It has lots of advantage, such as test exactly, operated simply, strong expand, etc. It's the best choice for small capacity testing.

Model	UTM-508B1	UTM-513B1	UTM-508E
Max. Capacity	5 KN (500 kgf)	5 KN (500 kgf)	500 N (50 kgf)
Force resolution	1/10000	1/10000	1/10000
Travel resolution	0.005 mm	0.005 mm	0.005 mm
Speed	1~1000 mm/min	1~1000 mm/min	6~600 mm/min
Motor power	400w	400w	-
Speed accuracy	±0.5%	±0.5%	±0.75%
Throat depth	70mm	70mm	50mm
Motor style	AC servo motor	AC servo motor	Step motor
Testing Space	140 mm	140 mm	100 mm
Dimension	50x53x145 cm	50x53x100 cm	42x28x88 cm
Weight	80 kg	65 kg	27 kg
Power supply	220 V AC	220 V AC	100~240 V AC, 3A
PC-Port	USB	USB	USB
Data Sampling Rate	5K Hz	5K Hz	2K Hz
Stroke(w/o grips)	800 mm	400 mm	350 mm



**UTM-528K4, Electronic Test Stand**

UTM-528K4 test stand is designed to be available to mount with different brand/type of force gauge. The test stand is provided with displacement display, test speed is digital setting up, for small specimen, is the best choice as it is light and small without take space. You can manually operate the test stand to test automatically, or connect with computer to control the stand for going multi-functional material test and analyze.

Model	UTM-528K4
<b>Max. Capacity</b>	500 N (50 kgf)
<b>Force resolution</b>	According to the specification of force gauge
<b>Travel resolution</b>	0.05 mm
<b>Speed</b>	3~600 mm/min
<b>Speed accuracy</b>	±0.75%
<b>Motor style</b>	Step motor
<b>Testing Space</b>	55 mm
<b>Dimension</b>	42x28x88(H) cm
<b>Weight</b>	27 kg
<b>Power supply</b>	100~240 V AC, 3A
<b>Stroke(w/o grips)</b>	400 mm



**UTM-513B2/508B2, Universal Testing Machine Single column (2KN)**

UTM-513B2 & UTM-508B2 type; B2 controller serial is simplest type, controller and machine movement operate independently, provided with output signal of stop machine, collocate with different type flexible. Provided with data output function, can connect to computer and do analyses, statistics, save data with special software. Single column types include various stroke models and capacity for choosing, and apply to metal, rubber, plastic, fabric, leather, paper, component material etc. This can provide more economic solution for testing and satisfy testing requirement of finished product and semi-finished product.

**UTM-506B2/506B2(extend), Testing Machine (5KN)**

UTM-506B2 include standard, extend length type, and conform with various testing request to providing best test state for the different between specification of specimen, testing environment, testing force etc. This type is suitable for testing within 5KN capacity. Table type, convenient to operate, small volume and strong structure won't occupy space, transmission efficiency more than 85%, less energy loss and high precision, operate easily, could connect to computer.



Model	UTM-513B2	UTM-508B2	UTM-506B2	UTM-506B2 (Extend)
<b>Max. Capacity</b>	2 KN (200 kgf)	2 KN (200 kgf)	5 KN (500 kgf)	5 KN (500 kgf)
<b>Force resolution</b>	1/10000	1/10000	1/10000	1/10000
<b>Travel resolution</b>	0.005 mm	0.005 mm	0.005 mm	0.005 mm
<b>Speed</b>	25~500 mm/min	25~500 mm/min	25~500 mm/min	25~500 mm/min
<b>Speed of force 200kg</b>	15~500 mm/min	12~500 mm/min	-	-
<b>Speed of force 500kg</b>	25~500 mm/min	-	15~500 mm/min	15~500 mm/min
<b>Speed of force 1000kg</b>	-	-	50~500 mm/min	50~500 mm/min
<b>Throat depth</b>	70 mm	70 mm	-	-
<b>Testing Space</b>	-	-	420 mm	420 mm
<b>Motor power</b>	120w	120w	120w	120w
<b>Motor style</b>	DC motor	DC motor	DC motor	DC motor
<b>Effective width</b>	Ø140 mm	Ø140 mm	Ø420 mm	Ø420 mm
<b>Dimension</b>	55x55x104(H) cm	55x55x150(H) cm	97x58x150(H) cm	97x58x184(H) cm
<b>Weight</b>	65 kg	80 kg	150 kg	175 kg
<b>Power supply</b>	200~240 V AC	200~240 V AC	200~240 V AC	200~240 V AC
<b>PC-Port</b>	USB	USB	USB	USB
<b>Data Sampling Rate</b>	1K Hz	1K Hz	1K Hz	1K Hz
<b>Stroke(w/o grips)</b>	400 mm	800 mm	800 mm	1000 mm
<b>Optional Accessories</b>	UTM-TECH Software Grips Extensometer PC	UTM-TECH B2 Software Grips Extensometer UTM-515/UTM-558 PC	-	-FF

# MATERIAL TESTING 10kg, Horizontal Tensile Testing Machine

## UTM-507E Horizontal Tensile Tester



UTM-507E

This machine is suitable for 180 degree peel test of tape and electronic packing belt.

It can perform friction test and tensile test of small force as well.

The horizontal type tester offers a better solution for some special requirements that a vertical type tester can not do.



Model No.	UTM-507E
Load Capacity	100N (10kgf)
Stroke (w/o Grips)	300mm
Position Control Resolution	0.005mm
Max. Speed	500mm/min
Min. Speed	5mm/min
Speed Accuracy	±0.75%
Motor Style	Step Motor
Language	Chinese / English Selectable
Pc-Port	USB
Data Sampling Rate	2KHZ
Resolution Of Force	1/10,000
Load Cell Accuracy	±1.0%
Dimension	92x30x38 cm
Weight	36kg
Power Supply	100~240VAC, 3A

### Software:

#### Software of computerized serial





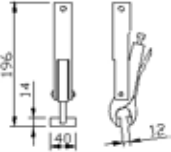
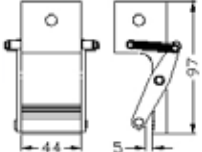
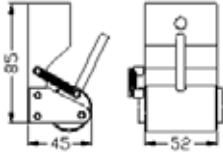
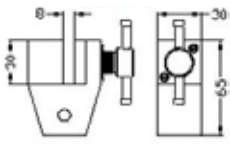
- Setting testing condition and operate directly through computer.
- Setting various testing mould, e.g. tension test, compression test, bending test, peel test, creep test, test, spring test, foam test, user defined test etc.
- Various unit selectable: Unit is interchangeable between Metric system and English system, also can set the decimal place of each unit.


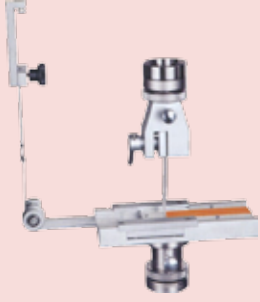


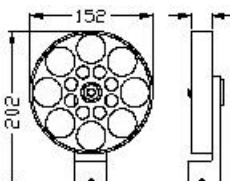
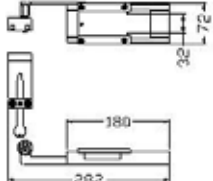
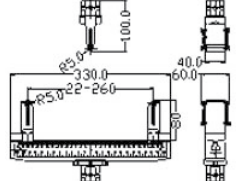
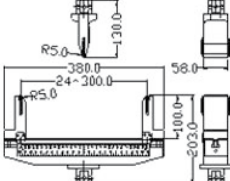
- Force (kN, N, tonf [SI, long, short], kgf, gf, lbf, ozf)
- Length (m, cm, mm, ft, in)
- Stress (GPa, MPa, kPa, Pa, kN/m<sup>2</sup>, N/m<sup>2</sup>, N/cm<sup>2</sup>, N/mm<sup>2</sup>, kgf/mm<sup>2</sup>, gf/cm<sup>2</sup>, gf/mm<sup>2</sup>, lbf/ft<sup>2</sup>, lbf/in, kpsi, psi)
- Time (min, sec, msec)
- Speed (cm/min, cm/sec, mm/min, mm/sec, in/min, in/sec).

- Protection mode: Over load protection, over displacement protection.
- Display X-Y, X-T, Stress-Strain curve and data synchronously.
- Analyze data, statistics, save data by computer.
- Connect with computer by USB.

#### Software of Electronic serial

- Connect with computer by USB.
- Setting various testing mould, e.g. tensile, compression, bending, peel test etc.
- Display X-Y, X-T, Stress-Strain curve and data synchronous.
- Analyze data, statistics, save data by computer.

Model	UTM-GR-A010	UTM-GR-A020	UTM-GR-A030	UTM-GR-B010
Image				
Max. Capacity	2KN	2KN	2KN	200KN
Specimen Width	40mm	44mm	52mm	30mm
Specimen Thickness	1~12mm	0.1~5mm	0.1~5mm	0.1~5mm
Grip Weight	984g	687g	876g	212g
Grip Material	Steel	Steel	Steel	Aluminium Alloy
Temperature Limits	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C	-10°C~+100°C
Min Load Cell	200N	200N	200N	20N
Applicable Adapter	GR-02	GR-02	GR-02	GR-02
Application	Rubber / Plastic / Fabric	Ductile Rubber / Ductile Plastic	Ductile Rubber / Ductile Plastic	Tapes, Films / Paper
Diagram				

Model	UTM-GR-B020	UTM-GR-B030	UTM-GR-C010	UTM-GR-C020
Image				
Max. Capacity	200N	200N	5KN	10KN
Specimen Width	25.4mm	32mm	40mm	58mm
Specimen Thickness	0.1~3mm	0.01~3mm	-	-
Specimen Distance	-	-	22~260mm	24~300mm
Grip Weight	949g	1110g	up 901g / down 5342g	up 1960 / down 11510g
Grip Material	Aluminum Alloy	Steel	Steel	Steel
Temperature Limits	-10°C~+100°C	-10°C~+100°C	-30°C~+200°C	-30°C~+200°C
Min Load Cell	-	-	200N	500N
Applicable Adapter	GR-02	GR-02	GR-02 / GR-03	GR-02 / GR-03
Application	Tapes / Films / Ductile Circuit Board	Tapes / Films / Ductile Circuit Board	Metal / Wood / glasses / Rigid Plastic	Metal / Wood / glasses / Rigid Plastic
Anvil Radius	-	-	R=5mm (adjustable)	R=5mm (adjustable)
Diagram				

Model	UTM-GR-D01A	UTM-GR-D01D	UTM-GR-D01G	UTM-GR-D020
Image				
Max. Capacity	2KN	2KN	2KN	2KN
Specimen Width	78mm	78mm	78mm	60mm
Specimen Thickness	0.2~5mm	0.2~5mm	0.2~5mm	0.2~5mm
Grip Weight	1600g	1600g	1600g	2142g
Grip Material	Steel	Steel	Steel	Steel
Jaw Face	Crosshatch	Rubber Faced	Waved	-
Temperature Limits	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C	0°C~+200°C
Min Load Cell	200N	200N	200N	200N
Applicable Adapter	GR-02	GR-02	GR-02	GR-02
Application	Textile / Rubber / Plastic	Paper / Textile / Rubber / Plastic	Textile	Textile / Plastic
Other Spec.	GR-D01B: A=50.8mm GR-D01C: A=25.4mm	GR-D01E: A=50.8mm GR-D01F: A=25.4mm	GR-D01H: A=20.8mm GR-D01I: A=25.4mm	-
Diagram				

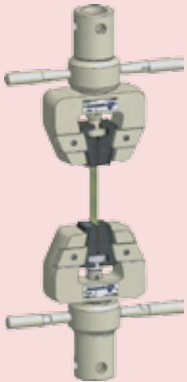
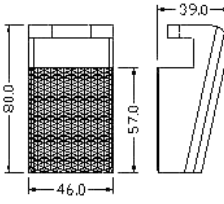
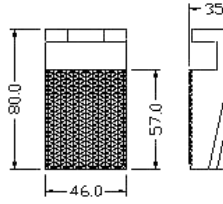
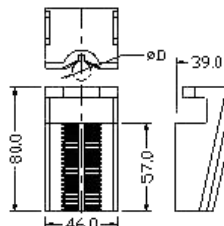
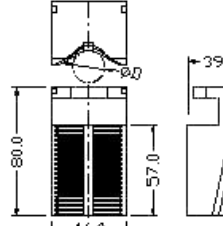
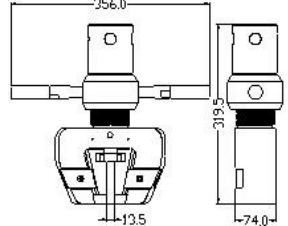
Model	UTM-GR-D030	UTM-GR-D040	UTM-GR-E010
Image			
Max. Capacity	5KN	1KN	200KN
Specimen Width	50mm	78mm	-
Specimen Thickness	0.5~25mm	1~45mm	-
Grip Weight	2800g	2100g	432g
Grip Material	Steel	Steel	Steel
Temperature Limits	0°C~+100°C	0°C~+200°C	0°C~+100°C
Min Load Cell	500N	200N	20N
Applicable Adapter	GR-02	GR-02	GR-02
Application	Textile / Plastic	Big Size Specimen	Yarn
Diagram			





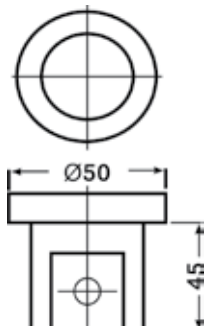
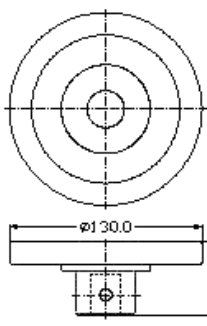
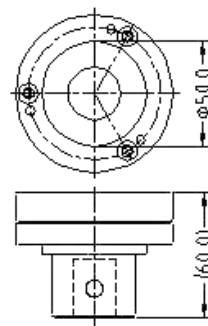
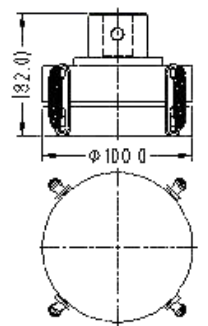
Model	UTM-GR-E020	UTM-GR-E030	UTM-GR-E040	UTM-GR-E050
Image				
Max. Capacity	2KN	500KN	100KN	2KN
Specimen Width	51mm	26mm	-	-
Specimen Thickness	0.2~3mm	0.1~2mm	-	-
Grip Weight	1120g	585g	245g	1400g
Grip Material	Steel	Steel	Aluminum Alloy	Steel
Temperature Limits	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C
Min Load Cell	200N	50N	20N	100N
Applicable Adapter	GR-02	GR-02	GR-02	GR-02 / M12
Application	Webbing / Packing belt	Yarn / Wire / Film	Yarn	Wire / Nylon line
Specimen Diameter	-	-	Ø0.5~Ø1mm	Ø0.5~Ø2mm
Diagram				

Model	UTM-GR-F010	UTM-GR-F01A TYPE JAW	UTM-GR-F01B TYPE JAW
Image		<p>Standard Specimen Specimen Thickness: 0.2~10mm A: Interchangeable Jaw Face B: Jaw Face Support</p>	<p>Thickened Specimen Specimen Thickness: 9~18mm</p>
		Application: metal Sheet / Wire / Plastic	
Max. Capacity	100KN	UTM-GR-F01F TYPE JAW	UTM-GR-F01G TYPE JAW
Specimen Width	30mm		
Specimen Thickness	1~12mm	Rod Specimen Specimen: Dia.(D) Ø6~Ø14mm	Rod Specimen Specimen: Dia.(D) Ø13~Ø20mm
Grip Weight	5246g	Application: Metal Rod / Plastic Rod / Rod or Tube Shape Materials	
Grip Material	Steel		
Temperature Limits	-30°C~+200°C		
Min Load	1KN		
Applicable Adapter	GR-02 / GR-03		
Diagram			

Model	UTM-GR-F020	UTM-GR-F02A TYPE JAW	UTM-GR-F02B TYPE JAW
Image			
		Standard Specimen Specimen thickness: 0.2~11mm	Thickened Specimen Specimen Thickness: 10~21mm
Max. Capacity	50KN	UTM-GR-F02F TYPE JAW	UTM-GR-F02G TYPE JAW
Specimen Width	40mm		
Specimen Thickness	0.1~5mm		
Grip Weight	10163g	Rod Specimen Specimen: Dia. $\varnothing 7 \sim 17 \varnothing \text{mm}$	
Grip Material	Steel	Rod Specimen Specimen: Dia. $\varnothing 16 \sim \varnothing 26 \text{mm}$	
Temperature Limits	-30°C~+200°C	Application: Metal Rod / Plastic Rod / Rod or Tube Materials	
Min Load	1KN		
Applicable Adapter	GR-03		
Diagram			
Model	UTM-GR-F030	UTM-GR-F03A TYPE JAW	UTM-GR-F03B TYPE JAW
Image			
		Standard Specimen Specimen Thickness: 1~11mm	Thickened Specimen Specimen Thickness: 10~19mm
Max. Capacity	100KN	UTM-GR-F03F TYPE JAW	UTM-GR-F03G TYPE JAW
Specimen Width	46mm		
Grip Weight	17522g		
Grip Material	Steel	Rod Specimen: Dia.(D) $\varnothing 8 \sim 17 \varnothing \text{mm}$	
Temperature Limits	-30°C~+200°C	Rod Specimen: Dia.(D) $\varnothing 16 \sim \varnothing 25 \text{mm}$	
Min Load	2KN	Application: Metal Rod / Plastic Rod / Rod or Tube Materials	
Applicable Adapter	GR-04		
Diagram			



Model	UTM-GR-F040	UTM-GR-F04A TYPE JAW	UTM-GR-F04B TYPE JAW
Image		 <p>Standard Specimen Specimen Thickness: 1~11mm</p>	 <p>Thickened Specimen Specimen Thickness: 10~19mm</p>
		Application: Wire / Metal Sheet	
Max. Capacity	200KN	UTM-GR-F04F TYPE JAW	UTM-GR-F04G TYPE JAW
Specimen Width	46mm	 <p>Rod Specimen: Dia.(D) Ø9~17Ømm</p>	 <p>Rod Specimen: Dia.(D) Ø6~Ø25mm</p>
Grip Weight	19150g		
Grip Material	Steel		
Temperature Limits	-30°C~+200°C		
Min. Load	5KN		
Applicable Adapter	GR-04	Application: Metal Rod / Plastic Rod	
Diagram			

Model	UTM-GR-G010	UTM-GR-G01A	UTM-GR-G020	UTM-GR-G030
Image				
Max. Capacity	5KN	10KN	5KN	20KN
Max. Diameter	50mm	130mm	90mm	100mm
Grip Weight	400g	1700g	1518g	3269g
Grip Material	Steel	Steel	Steel	Steel
Temperature Limits	-70°C~+200°C	-70°C~+200°C	-70°C~+200°C	-30°C~+200°C
Min. Load Cell	50N	200N	100N	500N
Applicable Adapter	GR-02 / GR-01	GR-02 / GR-03 / GR-04	GR-02	GR-02 / GR-03
Application	Can / Brittle Material	Can / Brittle Material	Spring / Foam	Concrete Material
Diagram				

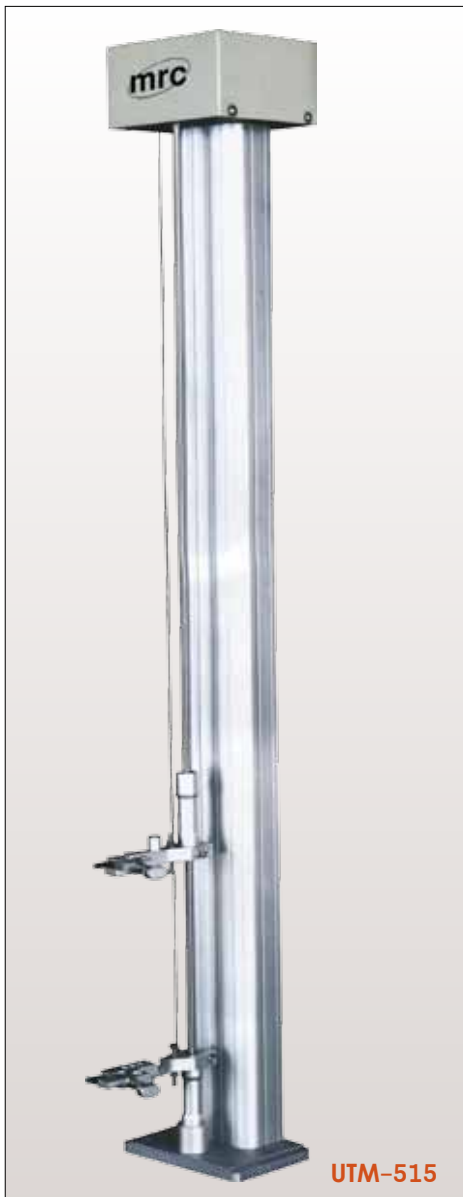
Model	UTM-GR-G040	UTM-GR-G050	UTM-GR-H010	UTM-GR-H020
Image				
Max. Capacity	500N	5KN	200N	20N
Specimen Width	-	-	30mm	16mm
Specimen Thickness	-	0.28~0.55mm	0.1~3mm	0.1~3mm
Grip Weight	1320g	7442g	480g	190g
Grip Material	Steel	Steel	Aluminum Alloy	Aluminum Alloy
Temperature Limits	-30°C~+200°C	0°C~+100°C	0°C~+40°C	0°C~+40°C
Min Load Cell	-	500N	20N	10N
Applicable Adapter	GR-02	GR-02	GR-02	GR-02
Application	Spring / Foam	Tappi T818 Paper Ring Crush	Plastic / Rubber Sheet / Wire / Paper	Plastic Sheet / Wire
Air Supply	-	-	40~80Psi	40~80Psi
Max. Diameter	Ø55mm	-	-	-
Specimen Size	-	12.7 x 152.4mm	-	-
Diagram				

Model	UTM-GR-I010	UTM-GR-H030	UTM-GR-H040	UTM-GR-H050
Image				
Max. Capacity	500N	1KN	1KN	5KN
Specimen Width	-	51mm	-	50mm
Specimen Thickness	-	0.1~12mm	0.1~4mm	0.5~12mm
Grip Weight	1320g	2250g	2503g	9337g
Grip Material	Steel	Aluminum Alloy	Aluminum Alloy	Steel
Temperature Limits	-30°C~+200°C	0°C~+40°C	0°C~+40°C	0°C~+40°C
Min Load Cell	-	200N	200N	1KN
Applicable Adapter	GR-02	GR-02	GR-02	GR-02
Application	Spring / Foam	Fabric / Paper / Leather / Plastic / Rubber	Nylon Line	Plastic / Rubber
Air Supply	-	40~80Psi	40~80Psi	40~80Psi
Test Area	60 x60mm	-	-	-
Diagram				

Model	UTM-GR-I030	UTM-GR-J010	UTM-GR-J020
Image			
Max. Capacity	500N	10KN	20KN
Specimen Width	-	50mm	81mm
Specimen Thickness	-	0.5~3mm	0.5~3mm
Specimen Diameter	1~9mm	-	-
Grip Weight	782g	4900g	11522g
Grip Material	Steel	Steel	Steel
Temperature Limits	0°C~+100°C	-30°C~+200°C	-30°C~+200°C
Min Load Cell	100N	2KN	2KN
Applicable Adapter	GR-02 / GR-03	GR-02 / GR-03	GR-02 / GR-03
Application	Rod Material	Webbing / High-Tension Material	Webbing / High-Tension Material
Diagram			

Model	UTM-GR-K010	UTM-GR-K020	UTM-GR-K030	UTM-GR-K03B	UTM-GR-L030
Image					
Max. Capacity	1KN	200N	500N	100N	-
Specimen Diameter	-	Ø0.5~Ø2.5mm	-	-	-
Button Dia.	-	-	-	-	Ø5~Ø15mm
Specimen Width	50mm	-	-	-	-
Jaw Face Width	-	-	25.4mm	12mm	-
Specimen Thickness	0.5~4mm	-	0.2~5mm	0.2~3mm	-
Grip Weight	1727g	Up 470g / Down 1748g	710g	253g	Up 925g / Down 3648g
Grip Material	Steel	Steel	Steel	Steel	Steel
Temperature Limits	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C	-30°C~+200°C	0°C~+200°C
Min Load Cell	50N	20N	50N	10N	20N
Applicable Adapter	GR-02	GR-02 / MB+GR-02	M12 / GR-02	M6 / GR-02	M6 / GR-02
Application	Zipper / Specimen-Fix One Side and Pull up	Spring	Smaller Specimen / Ductile Sheet Material	Smaller Specimen / Ductile Sheet Material	Button
Diagram					

Model	UTM-GR01	UTM-GR02	UTM-GR03	UTM-GR04
Image				
Max. Capacity	1000N	20KN	50KN	200KN
Adapter Material	Steel	Steel	Steel	Steel
Application	QC-528 / QC-508E	QC-528 / QC-508E / QC-513 / QC-508 / QC-506 / QC-505	QC-505 Series	QC-503 / QC-502 Series
Diagram				



### UTM-515, Extensometer

Extensometer is the essential equipment for measuring the elongation of specimen. It used in tensile test and sense the elongation when testing is processing. Extensometer is helpful to analysis test data at the same time, including force, elongation, time and so on.

MRC supply long extensometer and short extensometer according to different test materials. Long extensometer applies on rubber and plastic material. Short extensometer applies on metal and brittle material.

### How To Install On The Machine



### Long Extensometer

Model	UTM-515	
Type (Length)	A: Standard	B: Extended
Accuracy	0.1mm	
Resolution	0.025mm	
Drag Fore	Max/0.25N	
Stroke	700mm	1100mm
Gauge Length	15~50mm	
Output Signal	AB Phase	
Mounting Way	Fixed Holder / Revolvable Holder (option)	

**Short Extensometer**



Model	UTM-556	UTM-558
Gauge Length	50mm	25mm / 50mm
Elongation	50%	100% / 50%
Length Resolution	0.001mm	0.01mm
Output Signal	2 mV/V	AB Phase Differential Motion Output
Max. Output Frequency	-	64KHZ
Power Supply	DC 5-10V	DC 5V±5%
Application	A Series Controller	B1-A Series Controller
Weight	-	175g

**Chamber For Environmental Test**



Temperature and humidity can make great impact on physical properties of the test material. Therefore, materials which are used in specific condition need even more to pass through specific environmental test.

MRC offer various acquirments for environmental test, including high temperature test, low temperature test and humidity test. These chambers can be installed on universal testing machine to preform test under certain environmental conditions. These serial almost adapt double column type, it can also be used on single column type to meet special request.

**Oven**

- Inner size: Standard type 200x200x500mm.
- Temperature range: +50°C ~ +200°C.
- Attached stand with track to connect with universal testing machine.
- Attached extend shaft of thermal discharge type to reduce the effect of temperature to tester.

**Note: Temperature and inner size could be specified by customer.**

**Freezing Chamber**

- Inner size: Standard type 200x200x500mm.
- Temperature range: low temperature range: 0°C ~ -60°C, high temperate range: up to +150°C.
- Attached stand with track to connect with universal testing machine.
- Attached extend shaft of thermal discharge type to reduce the effect of temperature to tester.

**Note: Temperature and inner size could be specified by customer.**

**Humidity And Temperature Chamber**

- Inner size: Standard type 300x300x500mm.
- Temperature range: low temperature range: 0°C ~ -60°C, high temperature range: up to +150°C.
- Humidity range: 25-90%
- Attached stand with track to connect with universal testing machine.
- Attached extend shaft of thermal discharge type to reduce the effect of temperature to tester.

**Note: Temperature and inner size could be specified by customer.**

## MPA-1, Melting Point Apparatus



MPA-1 Digital Melting Point Apparatus is integrated with photoelectric detection, digital temperature display and other technologies, boasts automatic display of initial and final melts and other functions. In the temperature system, linearly calibrated platinum resistor is used as the detection device, offer efficient and accurate test process and results. The apparatus can be widely used in the chemical industry and medicine research and is essential for the production of medicines, spices, dyes and measurement of other organic crystal substances.

### Characteristics:

- Automatic photoelectric detection can well complete all detection tasks under no attention.
- It's mainly used for the detection of melting points of medicines, spices, dyes and other organic crystal substances.
- Large-size LCD screen can directly display as many as three melting curves at the same time

Model	MPA-1
<b>Melting point range</b>	Room temperature - 320°C
<b>"Initial temp." setting</b>	≤6min. from room temp. to 320°C ≤7min. from 320°C to room temp.
<b>Min. displayed temp.</b>	0.1°C
<b>Temp. accuracy</b>	±0.4°C (<200°C), ±0.7°C (<300°C)
<b>Linear temperature rise</b>	0.2°C/min, 0.5°C/min, 1°C/min, 1.5°C/min, 2°C/min, 3°C/min, 4°C/min or 5°C/min
<b>Standard capillary size</b>	Inside dia. 1.0mm, outside dia. 1.4mm
<b>Power supply</b>	220V 50Hz
<b>Power</b>	100W

## MPA-3, MPA-12 Melting Point Apparatus



MPA-12/3 Digital Melting Point Apparatus are integrated with photoelectric detection, digital temperature display and other technologies, boasts automatic display of initial and final melts and other functions. In the temperature system, linearly calibrated platinum resistor is used as the detection device, offering efficient and accurate test process and results. The apparatus can be widely used in the chemical industry and medicine research and is essential for the production of medicines, spices, dyes and measurement of other organic crystal substances.

### Characteristics:

- Advanced true-color VGA touch screen is easy for operation and observation.
- 8-level linear temperature rise design is satisfactory for varied temperature rise options.
- Wider temperature control scope and higher temperature accuracy.
- Optimal cooling rate and sample test speed.
- Exclusive integral design.
- It's completely in line with pharmacopeia and GLP requirements. (MPA-3 only)
- Three independent temperature detection systems ensure the detection of three samples of varied melting points. (MPA-3 only)
- The variation curve of tested sample can be displayed in a timely manner. (MPA-3 only)
- RS232 interface, associated computer software and external computer control are available.
- Detailed test data can be stored. (MPA-3 only)

Model	MPA-3	MPA-12
<b>Melting point range</b>	Room temperature - 400°C	
<b>"Initial temp." setting</b>	≤7min. from room temp. to 400°C ≤7.5min. from 400°C to room temp.	
<b>Min. displayed temp.</b>	0.1°C	
<b>Temp. accuracy</b>	±0.4°C (<200°C), ±0.7°C (<300°C)	
<b>Linear temperature rise</b>	0.1°C/min, 0.2°C/min, 0.5°C/min, 1°C/min, 2°C/min, 3°C/min, 4°C/min or 5°C/min	
<b>Standard capillary size</b>	Inside dia. 1.0mm, outside dia. 1.4mm	
<b>Power supply</b>	220V 50Hz	
<b>Power</b>	100W	



BODT-1

**Features:**

- Exchangeable microbe electrode units make operation smoother and less time-consuming than loading and replacing conventional membranes.
- Electrode units may be used for one month continuously or for three months intermittently with standard samples. (Electrode units should be stored in refrigerators when not taking measurements.)
- Front panel allows simple, pushbutton operation.
- Ease of replacement by installing electrode units or tubing into the opened door in the front panel.
- Anti-reflux valves and antibacterial tubing reduce the frequency of maintenance.
- Bacteriostatic is mixed into standard and buffer solutions, so measurements are stable over the long term.
- Measurements in regions of low concentration are especially stable.
- Changing pump rpm or sample contact time allows measurements in regions of high concentration.
- The optional microbe fixation kit enables the use of other microbes and, therefore, a variety of water samples.
- Making no use of dangerous reagents and emitting no harmful effluents, the Quick BODT-1 is environmentally friendly.

**BODT-1, Biological Oxygen Demand, With Integral Incubator**

The Quick BODT-1 takes significant steps to do away with the weaknesses of biosensor BOD measuring apparatus entailed by trouble and time required to replace and load microbe membrane and with an exchangeable electrode. Unit that makes it easy to use right away provides improved operability and maintainability standard and buffer bacteriostatic solutions and antibacterial tubing allow stable measurements for long terms. The dedicated shipping and recovery box for Used and replacement electrode units may be reused any number of times and the exclusion of apparatus environmentally friendly and easy to use .

Model	BODT-1
Measurement method	Biosensor
Measurable	Liquid samples containing soluble organic matter such as drainage and river water
Measurement range	0-20 mg/l (base Measurement range) Variable with pump rpm and sample Contact time
Measurement time	60 min/specimen (assuming calibration for each specimen)
Calibration	Single-point calibration with glucose glutamic solution
Readout	LCD, 20 characters x 2 lines Precision up to 0.1 mg/L
Reproducibility	Full-scale within $\pm 5\%$
Output	Recorder output (0-5 V analog output) Hot output (0-5 V analog output) Printer output (Printy 3 serial thermal printer)
Temperature controller	Adjustable within $35^{\circ}\text{C} \pm 0.2^{\circ}\text{C}$
Rated power source	AC 100V $\pm 10\text{V}$ , 50/60HZ, 3A max
Dimensions	W370 x D350 x H300 mm
Weight	14kg
Ambient temperature	5-40 $^{\circ}\text{C}$
Ambient humidity	90% RH max (Without condensation)
Peripherals	Standard solution, buffer solution, antibacterial tubing set, printer



BODT-5

**BODT-5, BOD Tester**

**Application:** Apply to Surface Water, Sewage, Industrial Wastewater in the BOD.

**Features:**

- Display the trend curve
- Printer output
- Link to the compute through USB interface
- Mercury-free devices to ensure the accuracy & safety of the BOD measurement
- Real-time clock display
- Automatic collection and storage of data
- Depict BOD curves for the user to view
- Link to the computer to print curves
- No parameter and data loss after sudden cut-off
- LCD humanization interface display, easy operation
- 1-30days of the test time, setting by the keys
- Store data and update the result, observe the change rate of BOD in the LCD screen during any testing time, store 240 data points and 20 groups data of each sample.

**Principle of Operation:**

The instrument is designed by the pressure-difference method, simulating the degradation of natural organic matter. 21% of the oxygen in the air on the top of Test Bottle continuously replenish the dissolved oxygen consumed in water, carbon dioxide (CO<sub>2</sub>) produced in the process of organic matter degradation is absorbed by Sodium hydroxide coming from sealed cap, pressure sensor monitor constantly the pressure change of sample bottle. There is a correlation between

Model	BODT-5
Measurable	liquid containing soluble organic matter, such as drainage and river water
Range	0-35, 0-70, 0-350, 0-700mg/L (without dilution) 700-4000 mg/L (need to dilute)
Sample Quantity	$\leq 6$ Bottle Capacity: 500mL
Repeatability	$\leq 5\%$
Resolution	0.1mg/L (0-35, 0-70mg/L) 1mg/L (0-350mg/L, 0- 700mg/L)
Dimension	350x400x350mm
Display	LED
Power Supply	AC 220 50Hz

Biochemical oxygen demand BOD (correspond to the consumption of oxygen in the test bottle) & Gas pressure, such relevance is dealt with by this instrument, direct display of Biochemical oxygen demand BOD value on the screen.



**DI-900**

**DI-900, Distance Laser Meter, up to 70 meter**

Model	DI-900
<b>Measuring Range</b>	0.05M~70M
<b>Resolution</b>	0.001M
<b>Accuracy</b>	±1.5mm
<b>Measuring Speed</b>	0.5 sec.
<b>Laser Type</b>	650 nm, Class 2, <1mW
<b>Beam Size</b>	25mm@30M
<b>Battery</b>	AA Batteries x 2
<b>Battery Life</b>	10,000 measures
<b>Dimension</b>	110mm x 45mm x 30mm
<b>IP Protection</b>	IP52
<b>Operation Temperature</b>	-5°C ~ 40°C
<b>Storage Temperature</b>	-20°C~60°C
<b>Automatic Power-Off</b>	Yes
<b>Laser</b>	30 seconds
<b>Device</b>	180 seconds
<b>Countdown Measure</b>	3~15 seconds, selectable



• The working range and accuracy is depending on how well the laser light is reflected from the surface of the target and with increased brightened of the laser point to the ambient light.

**Accessories:**

1. Carrying Case x 1
2. DI-900 Series x 1
3. Silica-gel Protector x 1
4. AA Batteries x 2
5. Safety Strap x 1
6. Engineering Pencil x 1
7. Operation Manual x 1

<p><b>New Engine, New Age, New Possibility-SX10</b></p>	<p><b>Dyna Measurement</b></p>	<p><b>Stake out measuring</b></p>	<p><b>Three Indirect measurements</b></p>	<p><b>Area and Space calculations</b></p>
<p>Our new measuring engine-SX10 based on own ASIC system, bring a 150% faster measuring speed and 125% more accuracy to you.</p> <p><b>LED Backlight</b></p>	<p>With SX10, a totally new experience of measuring is arrived to you, fast response, easy to seeking correct points. Finding.</p>	<p>Lazy finding sections? try stake-out with DI-900, simply set stake up &amp; HANS will guiding you during whole measure (dyna-measuring).</p>	<p>Thanks to Pythagorean, we could get height without be there. Now activate indirect measuring mode with DI-900, enjoy the wisdom from the past. and do not forget it could help to calculate when you need it.</p>	<p>with alert and direction With DI-900, do not worried about how large it is, how depth it is, just pressing your buttons and follow instruction on screen, you could even simply calculate your results, try it today!</p>





FG-5000A

**FG-5000A/FG-20KG, Force Gauge, 5000gram/20Kg**

- Wide capacity, high resolution, high accuracy, high repeatability.
- 3 kind display unit.
- Tension & compression capability.
- Peak hold (Max. load) can be held in display during make tension or compression measurement.
- Zero button can operate both for normal measuring & the "peak hold" operation.
- Full capacity zero (tare) control capability.
- Fast/Slow response time push button.
- Positive or reverse display direction select.
- Full line accessories (adapters) are included.
- Hand held & stand mounting available.
- Low power consumption gives long battery life.
- Build in low battery indicator.
- Microprocessor circuit & exclusive load cell transducer.
- Over load protection.
- RS-232 computer interface (optional).
- Professional test stand (optional).



FG-20KG

Model	FG-5000A	FG-20KG
<b>Display</b>	LCD (Liquid crystal display). 5 digits, 10 mm (0.4") digit size.	
<b>Display Direction</b>	Positive or Reverse direction, select by the push button on the front panel.	
<b>Function</b>	Tension & Compression (Push & Pull). Normal force, Peak hold (Max. load).	
<b>Peak hold</b>	Will freeze the display value of the Peak load (Max. load).	
<b>Zero</b>	Zero button can be operated both for "normal force" or "peak hold" operation	
<b>Measure Capacity</b>	5000g/176.40oz/49.03Newton	20.00Kg/44.10LB/196.10Newton
<b>Resolution</b>	1g/0.05oz/0.01Newton	0.01Kg/0.01LB/0.05Newton
<b>Min. Display</b>	3g/0.10oz/0.03Newton	0.01Kg/0.01LB/0.05Newton
<b>Accuracy</b>	± (0.4 % + 1 d), within 23± 5°C	± (0.5 % + 2 d), within 23± 5°C
<b>Unit select</b>	g/oz/Newton	Kg/LB/Newton
<b>Update time</b>	Fast - Approx. 0.2 second, Slow - Approx. 0.6 second.	
<b>Over range Indicator</b>	Display show " - - - - " when in over range status.	
<b>Overload Capacity</b>	Max. 7 kg	Max. 30 kg
<b>Zero/tare Control</b>	Max. full capacity.	
<b>Circuit</b>	Exclusive microprocessor LSI-circuit.	
<b>Full Scale Deflection</b>	Approx. 2.0 mm max.	
<b>Operating Temp.</b>	0°C to 50°C (32°F to 122°F)	
<b>Operating Humidity</b>	Less than 80% R.H.	
<b>Power Supply</b>	6 x 1.5 V AA (UM-3) size battery or DC 9V adapter (not included).	
<b>Power Consumption</b>	Approx. DC 24 mA	
<b>Transducer / Weight</b>	Exclusive load cell / 551 g (1.2 LB)/with batteries	
<b>Dimension</b>	227 x 83 x 39 mm (8.9 x 3.3 x 1.5 inch).	
<b>Mounting Holes</b>	Main instrument with mounting holes are provided on the back case, easy stand mounting	
<b>Data output</b>	Optional, RS-232 serial computer interface	
<b>Accessories Included</b>	* Operating manual: 1PC * Flat-head adapter: 1 PC * Carrying case: 1 PC * Hook adapter: 1 PC * Cone head adapter: 1 PC * Chisel head adapter: 1 PC * 120 mm extension rod: 1 PC	
<b>Optional Accessories</b>	* Test stand, Model: FS-1001 * Wedge grip, Model: WG-01	

**Optional Equipment & Accessory**

<b>Test Stand Model: FS-1001</b>	Test stand, cooperate with Force gauge FG-20KG, FG-5000A, whole system will be become the useful tool for material's tension & compression analysis. Size: 630x250x230mm. Weight: 7.02 Kg (15.4 LB).
<b>Wedge grip Model: WG-01</b>	Wedge grip, the optional accessory to install to the base of FS-1001 be used to hold the tested material.

**Force Gauge with RS-232 Computer interface**

<b>FG-5000A/20A-RS232</b>	All the function are same as the FG-5000A/FG-20KG but with RS-232 computer interface.
<b>SW-U101-WIN</b>	Software for data logging & data recorder.





**PO2-250**

### PO2-250, O<sub>2</sub> Meter, Pen Type

- O<sub>2</sub> (Air oxygen) and Temp. (Air Temp.) measurement.
- O<sub>2</sub> measurement range : 0 to 30.0 % x 0.1 %.
- Temp. measurement range : 0 to 50°C, °C/°F.
- O<sub>2</sub> Buzzer warning : If the measurement value < 18.0 %O<sub>2</sub>, the buzzer will sound for warning.
- Galvanic cell type for O<sub>2</sub> sensor.
- High reliability Oxygen sensor, not be affected by acidic gases like CO<sub>2</sub>.
- Oxygen sensor with temperature compensated.
- Data hold, to freeze the desired reading value.
- Auto power off saves battery life.
- Operates from DC 1.5V (UM4/AAA) x 4 PCs batteries.
- Microprocessor circuit ensure high accuracy, and also provides special functions and features.
- Durable and compact ABS-plastic housing.
- Application: O<sub>2</sub> monitor/dectors, Food industrial (Refrigerator, Vegetable factory), Bio-Technology (Oxygen incubator, Anaerobic cultivator), Security system (Air conditioner and Oxygen shortage alarm system, Fire alarm system), Fuel cell system.

Model	PO2-250	
Display	LCD size : 28 mm x 19 mm.	
Measurement	O <sub>2</sub> (Air oxygen) Temperature (Air Temp.)	
Sensor	Oxygen	Galvanic cell type
	Temperature	Thermistor
Circuit	Custom one-chip of microprocessor LSI circuit.	
Data Hold	Freeze the display reading.	
Sampling Time	Approx. 1 second.	
Power Off	Auto shut off saves battery life.	
Operating Humidity	Less than 80% R.H.	
Operating Temp.	0°C to 50°C	
Power Supply	DC 1.5V battery ( UM-4/AAA ) x 4 PCs.	
Power Consumption	Approx. DC 4.0 mA.	
Weight	194 g/ 0.43 LB.	
Dimension	180 x 40 x 40 mm (7.1" x 1.6" x 1.6")	
Accessories Included	* Instruction manual: 1PC * Meter with sensing head: 1 Set * Magnetic base: 1 PC * Soft carrying case, CA-52A: 1 PC	
Application	* O <sub>2</sub> monitoring. * Food industrial: Refrigerator, Vegetable factory * Bio-Technology: Oxygen incubator, Anaerobic cultivator * Security system: Air conditioner & Oxygen shortage alarm system, Fire alarm system * Fuel cell system.	

### O<sub>2</sub> (Air oxygen)

Range	0 to 30 %O <sub>2</sub> .
Resolution	0.1 %O <sub>2</sub> .
Accuracy	± (1% reading + 0.2% O <sub>2</sub> ). @ After calibration
Response time	≤15 seconds. @ t 90
Overload protection	100 %O <sub>2</sub> .
Environment pressure range	0.9 to 1.1 atmosphere.
Expected life time	≥2 years.
Alarm	If the measurement Air oxygen value < 18.0 %O <sub>2</sub> , the buzzer will sound for warning.

### Temperature

Range	0°C to 50°C/32°F to 122°F
Resolution	0.1 degree
Accuracy	°C - ± 0.8°C °F - ± 1.5°F



**PCO-350, CO Meter, Pen Type**

- Two function: CO (Carbon monoxide), Temperature.
- CO range: 0 to 1,000 PPM x 1 PPM.
- Temperature.: 0 to 50 °C, °C/°F
- CO measurement with fast response time.
- High repeatability and high accuracy.
- Pen type, easy to carryout and operation.
- CO function with alarm setting.
- Data hold function for freezing the desired value on display.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Auto shut off is available to save battery life.
- Operates from DC 1.5V (UM4/AAA) x 4 PCs batteries.
- Durable and compact ABS-plastic housing.

<b>Model</b>	<b>PCO-350</b>	
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.	
<b>Display</b>	LCD size : 28 mm x 19 mm.	
<b>Measurement</b>	CO( Carbon dioxide ), Temperature	
<b>Unit</b>	CO	PPM
	Temp.	°C, °F
<b>Sensor Type</b>	CO	Electrochemical
	Temp.	Thermistor
<b>Temp. Compensation</b>	Automatic temp. compensation for CO measurement.	
<b>Alarm Setting</b>	For CO measurement only.	
<b>Data Hold</b>	Freeze the display reading.	
<b>Sampling Time</b>	Approx. 1 second.	
<b>Power Off</b>	Auto shut off saves battery life.	
<b>Zero</b>	Build in zero button for offsetting the zero value	
<b>Operating Humidity</b>	Less than 80% R.H.	
<b>Operating Temp.</b>	0°C to 50°C	
<b>Power Supply</b>	DC 1.5V battery ( UM-4/AAA ) x 4 PCs.	
<b>Power Consumption</b>	Approx. DC 4.0 mA.	
<b>Weight</b>	194 g/ 0.43 LB.	
<b>Dimension</b>	180 x 40 x 40 mm (7.1" x 1.6" x 1.6")	
<b>Accessories Included</b>	* Instruction manual: 1PC * Soft carrying case, CA-52A: 1 PC	

**CO (Carbon dioxide)**

<b>CO (Carbon monoxide)</b>	<b>Range</b>	0 to 1,000ppm
	<b>Resolution</b>	1ppm
	<b>Accuracy</b>	± (5% + 2ppm)
	<b>Response time</b>	< 30 seconds
	<b>Repeatability</b>	< 2%
	<b>Zero drift in long term</b>	< 5 PPM
	<b>Sensitivity drift</b>	< 5% per year
	* The response time value is specified to reach the 90% reading value	
<b>Temperature</b>	<b>Range</b>	0°C to 50°C, 32°F to 122°F
	<b>Resolution</b>	0.1 degree
	<b>Accuracy</b>	°C: ± 0.8°C °F: ± 1.5°F



MCH-383SD

### MCH-383SD, CO<sub>2</sub>/Humidity/Temp. Monitor, SD Card Real Time Datalogger, Patent

- Monitor with real time datalogger, save the measuring data along the time information (year, month, date, hour, minute, second) into the SD memory card and can be down load to the Excel, extra software is no need. user can make the further data or graphic analysis by themselves.
- Show CO<sub>2</sub> (Carbon dioxide), Humidity and Temperature value in the same LCD.
- NDIR method principal for CO<sub>2</sub> (Carbon dioxide) measurement, available for long term operation. high repeatability and high accuracy.
- 0.1 %RH resolution for the humidity reading, 0.1 degree resolution for the Temp. reading.
- Used the precision capacitance type humidity sensor, professional and high accuracy.
- SD card capacity: 1 GB to 16 GB.
- Large LCD display, easy readout.
- Microcomputer circuit, high accuracy.
- Low power consumption and long battery life when use battery power.
- Power supply from AC/DC 9V adapter in.
- RS232/USB computer interface.
- Patented

Model	MCH-383SD	
Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 60 mm x 50 mm	
Measurement	CO <sub>2</sub> (Carbon dioxide) Humidity and Temperature	
Unit	CO <sub>2</sub> : ppm, Humidity: %RH, Temp.: °C, °F	
CO <sub>2</sub> Sensor Structure	NDIR	
Temp. Compensation	Automatic temp. compensation for CO <sub>2</sub> measurement.	
Response Time for CO <sub>2</sub> measurement	CO <sub>2</sub> : < 2 min. typically. * Reach the 63% reading value * Depend the environment air circulation.	
Datalogger Sampling Time Setting range	5/10/30/60/120/300/600 seconds or Auto. * Default sampling time is 60 seconds. * The "Auto" sampling . means when the measuring value is changed (> ± 1 %RH or > ± 1 °C or ± 50 ppm) will save the data one time only.	
Data error no.	≤ 0.1 % no. of total saved data typically.	
Memory Card	SD memory card. 1 GB to 16 GB.	
Advanced setting 1	* SD memory card Format * Set clock time (Year/Month/Date, Hour/Minute/Sec.) * Set sampling time * Set beeper sound ON/OFF * Set SD card Decimal character * Select the Temp. unit to °C or °F * Set RS232 data output ON/OFF	
Advanced setting 2	* Set CO <sub>2</sub> height (meter) compensation value * Set CO <sub>2</sub> height (feet) compensation value	
Update Time of Display	Approx. 1 second if measuring data is changed.	
Data Output	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
Power Supply * Clock backup	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent	
Power Supply * Meter & probe	* DC 9V adapter input. (AC/DC power adapter is included)	
Operating Temperature	0 to 50°C	
Operating Humidity	Less than 90% R.H.	
Weight	Meter	240 g/0.53 LB.
	CO <sub>2</sub> probe	158 g/0.35 LB.
Dimension	Meter: 132 x 80 x 32 mm ( 5.2 x 3.1 x 1.3 inch ) ; CO <sub>2</sub> probe: 132 x 38 x 32 mm	
Accessories Included	* Instruction manual: 1PC * CO <sub>2</sub> probe * AC to DC 9V adapter: 1PC * Main meter hanging unit (with sticker): 1PC * CO <sub>2</sub> hanging unit (with sticker)	
Optional Accessories	* SD card (2GB), SD-2GB * USB cable, USB-01. * RS232 cable, UPCB-02. * Data Acquisition software, SW-U801-WIN.	

### Electrical Specifications (23±5°C):

CO <sub>2</sub>	Range	0 to 4,000ppm
	Resolution	1 ppm
	Accuracy	± 40 ppm * ≤ 1,000 ppm. ± 5% of reading * > 1,000 ppm ≤ 3,000 ppm. ± 250 ppm typically * > 3,000 ppm, reference only
Humidity	Range	10 % to 90 % R.H.
	Resolution	0.1 % R.H.
	Accuracy	≥70% RH: ± (4% reading + 1% RH). < 70% RH: ± 4% RH.
Temp.	Range	0°C to 50°C, 32°F to 122°F
	Resolution	0.1 degree
	Accuracy	°C - ± 0.8°C / °F - ± 1.5°F



### MS-7011, Humidity Content Meter, Stainless Professional Probe, RS232/USB Data Interface Dew Point, Type K Thermometer

- Professional Humidity content probe, used to measure the humidity content value for the materials of Grain, Corn, Rice, Cotton, Paper.
- Stainless probe body, Heavy duty.
- Humidity content + Dew point + Type K Thermometer are combined into one meter, intelligent.
- Thin-film capacitance sensor for humidity content measurement, high precision.
- Dew point measurement.
- Type K thermometer build in temperature linearity and precision cold junction compensation circuit, high accuracy.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Large LCD with two display, show the humidity content & temperature values at same time.
- Heavy duty & compact housing case, designed for easy carry out & operation.
- Records Maximum and Minimum readings with Recall.
- Auto shut off saves battery life.
- Data hold function for freezing the desired value on display.
- RS232/USB computer interface.
- °C, °F conversion is selected by push button on front panel easily.
- Built-in low battery indicator.

<b>Model</b>	<b>MS-7011</b>
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.
<b>Display</b>	51 mm x 32 mm, 15 mm (0.6") digit size. dual function LCD display.
<b>Measurement</b>	Humidity content: %RH (Relative Humidity) Temperature - °C, °F
	Dew point: °C, °F
	Type K thermometer: °C, °F
<b>Sensor Type</b>	Humidity Content : Humidity: High precision thin-film capacitance sensor. Temp.: Thermistor; Type K thermometer: Thermocouple probe.
<b>Data Hold</b>	Freeze the display reading by push button.
<b>Memory Recall</b>	Maximum & Minimum value.
<b>Sampling Time</b>	Approx. 0.8 second.
<b>Power off</b>	Auto shut off saves battery life or manual off by push button.
<b>Data Output</b>	RS 232/USB PC computer interface.
	Connect the optional RS232 cable UPCB-02 will get the RS232 plug.
	Connect the optional USB cable USB-01 will get the USB plug.
<b>Operating Humidity</b>	Main instrument : Less than 80%RH. Probe : Less than 95%RH.
<b>Operating Temp.</b>	0°C to 50°C
<b>Power Supply</b>	006P DC 9V battery (Alkaline or Heavy duty type).
<b>Power Consumption</b>	Approx. DC 7.0 mA.
<b>Weight</b>	Meter: 245 g/ 0.54 LB. Probe: 461 g/ 1.01 LB.
<b>Dimension</b>	Meter: 195 x 68 x 30mm (7.6 x 2.6 x 1.2 inch).
	Humidity Content Probe: Probe length : 600mm. Probe head diameter: 10mm. Cable length: 1.5meters
<b>Accessories Included</b>	* Instruction manual: 1PC * Humidity content probe, MS-71P: 1 Set * Instruction Manual: 1PC * Soft carrying case, CA-52A: 1 PC
<b>Optional Accessories</b>	* Probe sensing head with inner filter, MS71HEAD. * RS232 cable, UPCB-02. * USB cable, USB-01. * Data Acquisition software, SW-U801-WIN. * Type k thermocouple Probe: Model : TP-01, TP-02A, TP-03, TP-04.

### Electrical specifications ( 23±5°C)

#### Humidity Content

Humidity content	<b>Range</b>	10 to 95%RH
	<b>Resolution</b>	0.1%RH
	<b>Accuracy</b>	≥70%RH: ± (3% reading + 1%RH) < 70%RH: ± 3%RH.
Temp.	<b>Range</b>	0°C to 50°C, 32°F to 122°F
	<b>Resolution</b>	0.1 degree
	<b>Accuracy</b>	°C: ± 0.8°C °F: ± 1.5°F

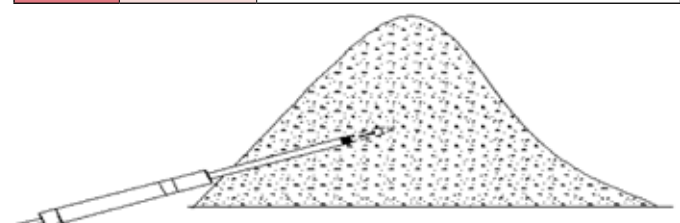
#### Dew Point

°C	<b>Range</b>	-25.3°C to 48.9°C
	<b>Resolution</b>	0.1°C
°F	<b>Range</b>	-13.5°F to 120.1°F
	<b>Resolution</b>	0.1°F

Remark: \* Dew Point display value is calculated from the Humidity/Temp. measurement automatically. \* The Dew Point accuracy is sum accuracy value of Humidity & Temperature measurement.

#### Type K Thermometer

°C	<b>Range</b>	-100.0°C to 1300.0°C
	<b>Resolution</b>	0.1°C
	<b>Accuracy</b>	-50.0°C to 1300.0°C: ± (0.2 % + 0.5°C) -50.0°C to 100.0°C: ± (0.2 % + 1°C)
°F	<b>Range</b>	-148.0°F to 2372.0°F
	<b>Resolution</b>	0.1°F
	<b>Accuracy</b>	-58.0°F to 2372.0°F: ± (0.2 % + 1°F) -58.1°F to 148.0°F: ± (0.2 % + 1.8°F)





### PMS-714, Soil Moisture Meter

- Designed to check the moisture level of soil or other similar material.
- Measurement range : 0 % to 50 % moisture content of soil sample with 0.1% resolution.
- All in one digital soil meter, easy to make operation.
- Data hold function to freeze the desired value on display.
- Microprocessor circuit ensures high accuracy and provides special functions and features.
- Operates from DC 1.5V (UM4/AAA) x 4 PCs batteries.
- Built-in low battery indicator.
- Durable, long-lasting components, enclosed in strong, compact ABS-plastic housing.

Model	PMS-714
<b>Applications</b>	Designed to check the moisture level of soil or other similar material.
<b>Measuring Principal</b>	Used the 2 pins electrode to measure the conductive ability of the species, then converter to the reading of " % " Moisture content " of soil sample.
<b>Display</b>	LCD size : 28 mm x 19 mm.
<b>Measurement Range</b>	0 % to 50 % moisture content on soil.
<b>Resolution</b>	0.1%
<b>Accuracy</b>	± (5% + 5d) F.S. @ 23± 5°C, F.S. : full scale.
<b>Circuit Probe</b>	Custom one-chip of microprocessor LSI circuit. 2 pins moisture electrode.
<b>Data Hold</b>	Freeze the display reading.
<b>Sampling Time</b>	Approx. 0.8 second.
<b>Operating Humidity</b>	Less than 80% R.H.
<b>Operating Temp.</b>	0°C to 50°C
<b>Power Supply</b>	DC 1.5V battery ( UM-4/AAA ) x 4 PCs.
<b>Power Current</b>	Approx. DC 12 mA.
<b>Weight</b>	267 g/ 0.58 LB. @ Battery is included.
<b>Dimension</b>	Meter body: 172 x 40 x 40 mm (6.8" x 1.6" x 1.6").
	Probe body: 220 mm x Dia. 10 mm (8.7" x Dia. 0.4").
	Total length (meter + probe): 392 mm (15.4").
<b>Accessories Included</b>	* Instruction manual: 1PC
<b>Optional Accessories</b>	Hard carrying case, CA-06.

### 445703, Big Digit Hygro-Thermometer Wall Mount

Large 1" Digits on Dual LCD, Display Humidity and Temperature

- 1" digits displayed on Large LCD (3.1 x 2.4"/80 x 62mm) provide simultaneous measurements of humidity & temp.
- Memory with reset function stores maximum and minimum measurements
- Measuring range: Temperature 14 to 140°F (-10 to 60°C) Humidity 10% to 99% RH
- Accurate to 5% RH, 1°C, and 1.8°F (@ 0 to 50°C/32 to 122°F)



- °C/°F switchable temperature measurements
- Low battery indication
- Dimensions: 4.3 x 3.9 x 0.78" (110 x 100 x 20mm)
- Weight 6oz (169g)
- Complete with built-in tilt stand, wall mounting bracket, and 1.5V AAA battery.

#### Applications:

Use in factories, greenhouses and offices to maintain proper temperature and humidity conditions and to record extremes during the day.

Model	445703
<b>Humidity range</b>	10 to 99%RH
<b>Basic RH accuracy</b>	± 5% (25 to 80%)
<b>Temperature range</b>	14 to 140°F (-10 to 60°C)
<b>Basic Temperature Accuracy</b>	± 1.8F/1°C (14 to 122°F)
<b>Dimensions</b>	4.3 x 3.9 x 0.78"(109 x 99 x 20mm)
<b>Weight</b>	6oz (169g)



**8808**

### 8808, BenchTop Large Display Temp. + RH% DataLogger

Model	8808
<b>Air Temp. Range</b>	-20 ~ 70°C
<b>Air Temp. Resolution</b>	0.1°C/°F
<b>Air Temp. Accuracy</b>	±0.6°C (0 ~ 50°C), others ±1.2°C
<b>Humidity range</b>	0%RH ~ 100%RH
<b>Humidity resolution</b>	0.1%RH
<b>Humidity accuracy</b>	±3%RH (at 25°C, 10 ~ 90%RH, others ±5%RH)
<b>Sampling points</b>	16000
<b>Button to on/off</b>	Yes
<b>Battery life time</b>	>3 Months
<b>LCD size (mm)</b>	51(H) x 63(W)mm
<b>Operating temp.</b>	0-50°C
<b>Operating RH%</b>	Humidity <80%
<b>Storage temp.</b>	-20 ~ 50°C
<b>Storage RH%</b>	Humidity <90%
<b>Dimension(mm)</b>	120x93x42(H) mm
<b>Weight</b>	~ 200g
<b>Battery</b>	AA bat.x4pcs or 9VDC adaptor
<b>Standard Package</b>	Meter/Batteries or adaptor/Manual/Paper box/USB Cable+Software CD
<b>Optional Accessory</b>	RH calibration salt kit

- Wall mountable super large display for easy reading and save space
- Air temp., dew point temp. & rh% display
- Tripod mountable receptacle for long time use.
- Detachable standers to transform as desktop.
- Recording temp. & humidity for quality control.
- Button and pc programing are both available.
- Several methods to start recording: schedule/immediately start/key start/

repeat • Recording function must be powered by adaptor • Monitoring mode is powered by battery or dc adaptor • Built in usb interface for program & down load • Led flash & audible warning while exceeding threshold • Up to 16000 points memories • Temperature units switchable • Salt bottle self-calibration available • Features: lcd display/date & time display.



**DlogMate-375**

### DlogMate-375, Portable Temp./Humidity DataLogger With LCD

Model	DlogMate-375
<b>Air Temp. Range</b>	-20 ~ 70°C
<b>Air Temp. Resolution</b>	0.1°C/°F
<b>Air Temp. Accuracy</b>	±0.6°C (0 ~ 50°C), others ±1.2°C
<b>Humidity range</b>	0%RH ~ 100%RH
<b>Humidity resolution</b>	0.1%RH
<b>Humidity accuracy</b>	±3%RH (at 25°C, 10 ~ 90%RH, others ±5%RH)
<b>Sampling points</b>	16000
<b>Button to on/off</b>	Yes
<b>Battery life time</b>	>3 Months
<b>LCD size (mm)</b>	20(H) x 40(W)mm
<b>Operating temp.</b>	0-50°C
<b>Operating RH%</b>	Humidity <80%
<b>Storage temp.</b>	-20 ~ 50°C
<b>Storage RH%</b>	Humidity <90%
<b>Dimension(mm)</b>	90x60x26.5(H) mm
<b>Weight</b>	~ 100g
<b>Battery</b>	ER3 x 1pc
<b>Standard Package</b>	Meter/Probe/Battery/Manual/Paper box/USB Cable+Software
<b>Optional Accessory</b>	Probe/Software & cable kit 19801 printer

- Recording temp. and humidity via external probe for quality control.
- Several methods to start recording: schedule/immediately/repeat/on line/ key start.
- 2 ways to program & down load:
  - via pc: RS232 or usb cable
  - via logger printer 9801: this is a 3 function in 1 printer for programing & download.
- Yellow recording led indicator.
- Red led flash while exceeding threshold • Can be used as regular temp. & humidity monitor while setting as non-sleep after recording • Up to 16000 points memories • Powered by lithium battery with long life time • Low battery indicator.

### D-LogMate-2TCK, 2 Channels, K Thermocouple Datalogger

Monitors temp. 2 separate type K, thermocouple to store measure • High temp. measurement • 5 start modes to activate logger's recording (immediate, schedule, on-line, key start, repeat) • LCD displaying data being stored & viewing current recording status.



Model	D-LogMate-2TCK
Range	-200~1370°C/-328~2498°F
Power bat.	3.6V Lithium battery (ER3)
Accuracy	±0.3%rdg±0.7°C(1.3°F)
Resolution	0.1°C/°F
Bat. low display	"BAT" icon display
Sample rate	16000
LCD display	SIZE: 20x40 mm
Dimensions(mm)	90x60x26.5 (H)
Optional accessory	USB Converter with cable & connector (RS232 to USB)
LED signal	Red (HI,LO Alarm)/Yellow(Record)

#### Features:

- Pressing Start/Stop button to activate logger.
- Features contacting measurement versatile K type sensors.
- Output: Big LCD display, RS232 interface connection to PC or uses USB converter to connect to USB port.
- Memory capacity : Total 16,000 points. K type : Dual K sensor inputs T1 and T2.
- Sample rate: User defined : From 1 second to 2 hours. Standards: CE and Rohs/WEEE compliance.

### D-LogMate Series, Temperature & Temperature Humidity Dataloggers



#### D LOGMATE-T

- Model 1T is without display.
- Up to 8000 readings.
- Wide operating range: Temp.: -40 to 85°C.



#### D LOGMATE-TD

- Up to 8000 readings.
- View temp. on LCD display.
- Wide operating range: Temp.: -40 to 85°C.



#### D LOGMATE-THD

- Up to 16,000 readings. (8000 readings for each parameter).
- View temp. & Humidity on LCD display.
- Wide operating range: Humidity: 0 to 100% RH, Temp.: -40 to 85°C.

Model	D LogMate TD	D LogMate THD
Temp. range	-40~85°C/-40~185°C	
Humidity range	N/A	0~100% RH
Power bat.	ER3 or CR2 lithium battery x1	
Accuracy	Temp. ±0.6°C(-20~50°C) ±1.2°C(-40~20°C, 51~85°C)	Temp. ±0.6°C(-20~50°C) ±1.2°C(-40~20°C, 51~85°C), Humidity: ±3%RH
Bat. low display	"Lo" display	
Sample data	Up to 16000	
LCD display	Size: 12x25.5mm	
Housing	Waterproof	
Dimensions (mm)	L124xW92xT37 (Interface), L80xW55xT22, L124xW92 (Complete set)	
LED signal	Red (hi,lo alarm)/yellow (record)	
Resolution	0.1°C(0.1°F)	
Cable length	150cm with DB9 connector	



## CR4-KTH, Humidity / Temperature Recorder

The CR4 six (6) inch Universal Chart Recorder offers the ultimate in flexibility. Choose one of 5 sensors for your application, connect it to the CR4 Universal Recorder, make desired speed selection and start recording. When your application calls for a different sensor, just change probes for the same recorder.



CR4-KTH

### Features:

- Automatic Probe recognition
- Front panel touch pad
- Real Time data view
- Battery backup
- Field replaceable probes
- Field calibration of probes
- Independent Channel Alarms
- Temperature and Humidity Probe.

Model	CR4-KTH
Chart Diameter	6 inches
Chart Rotation Mode	Continuous or Single turn
Chart Rotation Speed	1.5, 3, 6, 12 & 24 hrs, 7 & 31 days
Chart Speed Accuracy	±1%
Charts	60 assorted included
Display	LCD (2 line)
Temperature alarm Range	-20°F to 120°F (-30°C to 50°C)
Relative Humidity alarm Range	0 to 100%
Pressure Alarm Range	0 to 500 PSI ( 0 to 35 Bar)
Alarm Delay	NO DELAY, 10 mins., 30 mins., 1 hr. or 2 hrs.
Remote Alarm Connection	NO, 48 VAC/DC, 0.1 A resistive load
Operating Temperature	32°F to 120°F (0°C to 49°C)
Primary Power	115 VAC, 50/60 Hz (230 VAC, 50/60 Hz optional)
Alternate Power	12 V vehicle operation (need optional adapter)
Battery backup	8 AA alkaline batteries
Battery Life	48 hrs. continuous

## Temperature Recorders

The CR87 Six(6) Inch Chart Recorder Series set the standard for reliable and rugged trend reporting. Choose the right model for your application.

**Common Features:** Micro-controller design • Large LED Display • Front Panel controls • Single or continuous chart rotation • Choose from 120V or 220V models (see chart) • Battery Backup • 12 V operation • Comes with 2 cartridge pens & 60 (6" dia.) assorted charts • Convenient folding handle • Snap-on support legs • Free standing or wall mount.



CR87B220C

### CR87B220C, Temperature Recorder, -40°C to +50°C

#### Applications:

- Designed for Refrigerators/Freezers, Laboratory and Environmental Applications
- Measures and records temperature in air, gas, liquids, powders, solids, and semi-solids.

#### Features:

- Temperature range: -40°F to 120°F (-40°C to 50°C)
- Remote readings from up to 100ft. (optional sensor wire p/n CABLE10T)
- Programmable speed and temperature ranges.



CR87HT220C

### CR87HT220C, High Temperature Recorder, 0°C to +500°C

#### Applications:

- Broad range of Temperature Applications
- Measures and records temperature in air, gas, liquids, powders, solids, and semi-solids.

#### Features:

- Temperature range: 0°F to 1000°F (0°C to 500°C)
- Remote readings from up to 200ft.
- Programmable speed and temperature ranges.



TES-1332A

- Spectral Sensitivity close to CIE photo pic Curve.
- Cosine Angular corrected.
- Analog output jack for recording.
- Data Hold function.

### TES-1332A, Light Meter

Model	TES-1332A
Display	3 1/2 digit LCD
Measuring Range	200/2000/20000/200000 Lux (1332A) 20000 lux-reading x 10, 200000 lux-reading x 100
Over range Display	Highest digit of (1) is displayed
Resolution	0.01 Lux(1330A) & 0.1 Lux
Accuracy	± 3% rdg ± 0.5% f.s. (<10,000 lux) ± 4% rdg ± 10dpts (>10,000 lux) (calibrated to standard incandescent lamp, 2856 K)
Repeatability	±2%
Temperature Characteristics	±0.1%°C
Measuring Rate	Approx. 2 times/sec.
Recorder Output	DC 2V/f.s. (full scale) (TES-1332A)
Operating Temp. & Humidity	0°C to 40°C (32°F to 104°F) < 70% R.H.
Power Source	one 9V battery
Dimensions	100mm(L) x 60mm(W) x 27mm(H)
Dimension	135mm(L) x 72mm(W) x 33mm(H)
Weight	250g
Accessories	Carrying case, 9V battery & Instruction Manual



8910

### 8910, Air Flow & Barometric Pressure Meter

- Small pocket knife shape & compact design
- Measures air velocity ,temp., humidity, windchill temp., dew point temp., barometric pressure, heat index and altitude
- Barometric pressure history bar chart display
- Wind units selectable: knt (knot), bf (beaufort), fpm (feet per minute), mph(mile per hour), ms (meter per second), kmh (kilometer per hour)
- Temp. units °c/of selectable
- Barometric pressure in hg, mbar, hpa selectable
- Display max. & avg. wind speed and quick response
- Easy to operate by only two buttons
- Auto power off to save power
- Tripod mountable receptacle.

Measurements	Range
Wind speed Range	0.5-44.7M/H, 60-3937FT/M, 0.4-3B.BKNT, 1.1-20.0M/S, 0.7-72.0KMH, 1-BBF
Wind speed accuracy	±4% of rdg. or last significant digit (whichever is greater)
Air temp. range	-15-50.0°C
Air temp. resolution	0.1°C/°F
Air temp. accuracy	±1°C
Air RH% range	5%RH 95%RH
Air RH% resolution	0.1%RH
Air RH% accuracy	±3%RH(at 25°C, 10-90%RH, others ±5%RH)
Pressure range	400 ~ 1100mbar
Pressure resolution	1 (400-1100mbar/hPa), 0.1 (11.B-32. 5 in Hg)
Pressure accuracy	±3hPa (at-10-60°C)
Altitude range & res.	-600-7000M (1 M), -900-9000Ft (3 Ft)
Altitude/Pressure update	60 seconds
Wind speed response time	averaging every 2 seconds
Temp. response time	60 seconds (typical)
Air RH% response time	60 seconds (typical)
Pressure response time	15 minute (typical)
LCD update	every second
Windchill display	Yes
Dew point temp. display	Yes
Heat index display	Yes
Altitude display	Yes
LCD size	16(H)x2B(W)mm
Operating temp. / RH%	-15 ~ 50°C / Humidity <80%
Storage temp. / RH%	-10 ~ 50°C / Humidity <90%
Dimension(mm) / Weight	150x55x25 (90°folded); 235x55x25 (180°full opened) / ~ 90g
Battery	CR2032 x 1 pc
Standard Package	Meter/Battery/Manual/Strap/Paper box



MS-7003

**MS-7003, Moisture Meter, All in One, Bar Graph LED + LCD**

- Designed to check the moisture level of wood, concrete, and other non-wood material.
- 6 % to 40 % moisture range on wood.
- 0 to 100% relative moisture value for Concrete and other non-wood material.
- Red LED bar graph indicator and LCD digital display.
- All in one, meter build in the test pins.
- Optional separate probe, available for remote measurement.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Records Maximum & Minimum reading with recall.
- Data hold function to freeze the desired value on display.
- Heavy duty & compact housing case, designed for easy carry out and operation.
- Built-in low battery indicator.
- With auto power shut off function to prolong the battery battery life.

Model	MS-7003
<b>Applications</b>	Designed to check the moisture level of wood, concrete and other non-wood material.
<b>Principal</b>	Used the 2 pins electrode to measure the conductive ability of the species, then converter to the reading of % "Moisture of Content".
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.
<b>Display</b>	LCD size: 51 mm x 37 mm, Digit size: 16 mm (0.62")
<b>Material/Range</b>	Material 1: 0 to 100% relative moisture value for Concrete. and other non-wood material.
	Material 2: 6 % to 40 % moisture range on wood.
<b>Resolution</b>	0.1 %.
<b>Accuracy</b>	$\pm (5\% + 5d) @ 23 \pm 5^\circ\text{C}$ @ Material 1: 13% to 100% @ Material 2: 6 % to 40%
<b>Probe</b>	2 pins moisture electrode.
<b>Data Hold</b>	By push button on front panel.
<b>Memory Recall</b>	Records Maximum & Minimum reading value.
<b>Sampling Time</b>	Approx. 0.8 second.
<b>Operating Humidity</b>	Less than 80% R.H.
<b>Operating Temp.</b>	0°C to 50°C
<b>Power Supply</b>	Alkaline 006P, MN1604 (PP3) DC 9V battery.
<b>Power Current</b>	Approx. DC 16 mA.
<b>Weight</b>	251 g/0.55 LB.
<b>Dimension</b>	216.5 x 68.5 x 29.7 mm (8.4 x 2.7 x 1.2 inch).
<b>Accessories Included</b>	* Instruction manual: 1PC * Extra contact pins: 1 Set
<b>Optional Accessories</b>	* Separate Probe, MP-31 * Hard Carrying Case, CA-06 * Soft Carrying Case, CA-05A



### PS-9302, Pressure Meter

- Meter can cooperate with 2, 5, 10, 20, 50, 100, 400 bar sensor, new calibration are not necessary when change the new sensor.
- When change the new pressure sensor, just select pressure type (2, 5, 10, 20, 50, 100, 400 bar) on the front panel button. The sensor type will memorize into the circuit permanently by EEPROM.
- 8 kind pressure units (bar, psi, Kg/cm<sup>2</sup> mm/Hg, inch/Hg, meter/H<sub>2</sub>O, inch/H<sub>2</sub>O, Atmosphere) select by push button on the front panel.
- Optional full line pressure sensor (2, 5, 10, 20, 50, 100, 400 bar) are available
- Auto shut off saves battery life.
- 4 pin DIN socket, 2 pins to provide DC 5 V exciting voltage (power supply) to pressure transducer, another two pins for accept transducer signal of 100mV full scale.
- Zero button on the front panel, easy adjust the zero value of pressure sensor.
- Push button gain adjustment, usage for calibration precisely if necessary.
- Separate pressure sensor, easy operation. & remote measurement.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Super large LCD display with contrast adjustment for best viewing angle.
- Records maximum & minimum readings with recall.
- Data Hold function for stored the desired value on display.
- Built-in low battery indicator.
- RS232/USB PC serial interface, can match the personal computer used as the Datalogger, Pressure Recorder and other modern pressure measuring system.

Model	PS-9302
Circuit	Microprocessor LSI circuit.
Display	61 mm x 34 mm supper large LCD display. 15 mm (0.6") digit size.
Display units	bar, psi, Kg/cm <sup>2</sup> , mm/Hg, inch Hg, meter H <sub>2</sub> O, inch H <sub>2</sub> O, Atmosphere.
Accuracy	± (0.5% + 1d) * Under the signal from the sensor is at full scale (100 mV). * Meter only. * Within 23°C± 5°C
Pressure transducer	Optional, exciting voltage DC 5V, Sensor max. range output is DC 100 mV.
Zero adjust	Push button on the front panel.
Span adjust	Push button gain adjustment, usage for calibration precisely if necessary.
Transducer mV input signal	Approx 100 mV (Full Scale).
Exciting output power supply	DC 5 V.
Data hold	By push button.
Data record	Records Maximum & Minimum readings.
Power Off	Auto shut off saves battery life, or manual off by push button.
Data Output	RS 232 PC serial interface.
Sampling Time	Approx. 0.8 second.
Data Output	RS 232/USB PC serial interface.
Operating Humidity	Less than 80% R.H.
Operating Temp.	0°C to 50°C (32°F to 122°F)
Power Supply	006P DC 9V battery (heavy duty).
Power Current	Approx. DC 8.5 mA.
Weight	345 g/0.76 LB
Dimension	180 x 72 x 32 mm (7.1 x 2.8 x 1.3 inch).
Standard Accessories	* Instruction manual: 1PC
optional Accessories	* Pressure sensor, PS100-xxBAR refer to the bottom description. * Hard Carrying case (CA-06): 1PC * Data acquisition software , SW-U801-WIN * RS232 cable, UPCB-01 * USB cable, USB-01

Description	* Optional, pressure sensor that cooperate with PS-9302.
	* Out put : 100 mV DC for full scale.
Optional Pressure Sensors Models	* 4 pin DIN plug, 2 pins to accept DC 5 V exciting voltage (power supply) for pressure transducer, another two pins for output signal of 100mV full scale. Size : 30 mm dia. x 85 mm. Weight: 160 g. Pressure Port Connector : PS 1/4" (19 teeth per inch) or 1/4" NPT * Included one adapter connector that convert the 1/4" NPT to 1/4 " PS.
	2 bar sensor PS100-2BAR
	5 bar sensor PS100-5BAR
	10 bar sensor PS100-10BAR
	20 bar sensor PS100-20BAR
	50 bar sensor PS100-50BAR
	100 bar sensor PS100-100BAR
	400 bar sensor PS100-400BAR



### EMF-819, 3 Axis Radio Frequency Electromagnetic Field Meter, 50 MHz to 3 GHz, General Purpose

- 3 Axis probe.
- Radio frequency electromagnetic field tester.
- Wide measuring frequency ranges, 50 MHz to 3 GHz.
- EMF-819 is used for broadband devices of monitoring the wide range radio frequency electromagnetic field value.
- For precision measurement consideration, the meter is included one probe: EP-05H (High frequency Probe, 50 MHz to 3 GHz)
- Unit : V/m, W/m<sup>2</sup>, mW/cm<sup>2</sup>.
- Frequency team selection : two points, Normal, 2.45 GHz.
- Alarm setting function can warn the user if the measuring antenna is too near the strong radiation sources, the buzzer will sound to remind the user.
- Peak hold function to latch peak value.
- Data hold function to lock the current reading.
- RS232 computer interface.
- Hard carrying case is included.
- Large size LCD with contrast adjustment, which can fit best viewing angle.
- Microcomputer circuit provides special function & offers high accuracy.
- Powered by 006P DC 9V battery or DC 9V adapter.

**Applications:** This meter is specially developed for measuring or monitoring electromagnetic field, for example: cell-phone station, hospital equipment, radar, micro-wave oven, radiation work, TV antenna, Radio station, welding equipment, baking - equipment, television, computer, factory, laboratory, and other environment etc.

Model	EMF-819
Circuit	Custom one-chip of microprocessor LSI circuit.
Display	LCD size : 58 mm x 34 mm
Measurement Unit	V/m, mW/cm <sup>2</sup> , W/m <sup>2</sup> .
Accuracy	< 2 dB.
Probe structure	3 Axis.
Probe Input Impedance	50 OHM
Sensor Structure	Semiconductor
Frequency Team Selection	Two points selection : Normal, 2.45 GHz.
Data Hold	Freeze the display reading.
REC Function	Record Maximum & Minimum value.
Power off	Auto shut off saves battery life or manual off by push button. * Can default auto power off or manual power off. * When default auto power off, power will off automatically after 10 min. if no button be pressed.
Peak Hold	To latch the peak measurement value.
Alarm Setting	Buzzer will sound when display over the setting value.
Sampling Time	Approx. 1 second.
Low Battery Indicator	When display show Low battery Indicator, it should change the batteries.
Data Output	RS 232 PC serial interface.
Operating Temperature	0 to 50°C.
Operating Humidity	Less than 80% R.H.
Power Supply	DC 9 V battery (006P) * Heavy duty or Alkaline type.
	DC 9V adapter input.
Power Current	Approx. DC 5.95 mA
Weight	425 g/ 0.94 LB.
Dimension	Main instrument: 200.0x76.2x36.8mm Probe: 70mm (diameter) x240mm (length)
Accessories Included	* Instruction manual: 1 PC * EP-05H Probe: 1 PC * Memory card for EP-05H: 1 PC * Hard Carrying case: 1 PC * DC 9V power adapter: m1 PC
Optional Accessories	* RS232 cable, UPCB-02 * USB cable, USB-01 * Data Acquisition software, SW-U801-WIN

### Electrical Specifications (23±5°C):

Strength Range	Resolution	Effective Value
0 to 200.00 V/m	0.01 V/m	> 1 V/m
0 to 99.999 W/m <sup>2</sup>	0.001 W/m <sup>2</sup>	> 0.03 W/m <sup>2</sup>
0 to 9.9999 mW/cm <sup>2</sup>	0.0001 mW/cm <sup>2</sup>	> 0.0003 mW/cm <sup>2</sup>

Frequency Range	Accuracy	Test Point
* 50 MHz to 3 GHz	< 2 dB *	60 V/m

Remark: The above accuracy is specified base on the measurement frequency within 100 MHz to 2.5 GHz. If measurement is on other frequency range (below 100 MHz and over 2.5 GHz), the reading value just for reference only.  
 \* The default selection is "Normal", however if the measurement frequency is microwave or its frequency is near "2.45 GHz", it should select to " 2.45 GHz " will get the high precision.

### Safety Instructions

#### Danger

- For worker's safety, be aware that persons with electromagnetic implant (e.g. cardiac-pacemaker) are subject to especial danger in some case.
- Particular to observe the local safety regulations of the operator of the equipment.
- Before using the device, it need to know that how to setting "alarm-limit" value.

#### Attention

- Claims by some scientists that long term exposure to electromagnetic field may be the cause of childhood leukemia & other forms of cancer.
- Complete answers to any of these and related questions are not currently available. At the present time the most common practice is to avoid excess exposure over long period of time.
- Complete answers to any of these and related "Prudent Avoidance" as stated by the Environmental Protection Agency(EPA) USA is recommended.
- According to ICNIRP of reference levels to time-varying electromagnetic fields, The E-field strength levels are:

#### General public

Frequency range	e-field strength (V/m)
10 to 400 MHz	28
400 to 2000 MHz	$1.375 \times f^{1/2}$
2 to 300 GHz	61

#### Occupational

Frequency range	e-field strength (V/m)
10 to 400 MHz	61
400 to 2000 MHz	$3 \times f^{1/2}$
2 to 300 GHz	137



TM-92

#### TM-92, Radiation Monitor

TM-92 is easy to use for personal use in homes and offices, and can detect objects that have been polluted by beta or gamma active radioactive nuclides.

The TM-92 Radiation Monitor is a survey meter measuring the beta, gamma and x-ray radiation. It is useful in monitoring the environment, home safety, nuclear, medical, mining and metal industries. It is also ideal for border control, customs and cargo inspections.

**The values in  $\mu$  Sv/h,  $\mu$  Rem/h or mRemh are displayed on LCD screen**

#### Features:

- Built-in a GM tube.
- Quick response to the radiation strength of Beta and Gamma ray.
- Auto Ranging.
- Alarm Settings
- Automatic detection, easy setting.
- Low battery indication.
- Bright LCD display for night or day operation.
- A beeper chirps with each radiation count.
- Audio alarm set function.
- Display units in  $\mu$ Sv/h,  $\mu$ Rem/h and mRem/h.

Model	TM-92
Display	3 1/2 digit LCD
Display Range	0.1 $\mu$ Sv/h ~199.9 $\mu$ Sv/h 0.01 mRem/h~19.99 mRem/h
Resolution	0.1 $\mu$ Sv/h 0.01 mRem/h
Test Radiation	Beta(B) & Gamma(y) ray
Energy dependency	0.1 to 1.25 Mev
Accuracy	$\pm 15\%$ of reading
Operation Environment	0°C~50°C ; below 80% RH
Storage Environment	-20°C~60°C ; below 75% RH
Battery Type	006P 9V
Battery Life	about 50 hour
Dimension	143 x74 x34mm
Weight	220g



### SL-4030, Sound Level Meter, Mini Pocket Type, IEC 61672 Class 2

- Large LCD display, easy to read.
- Time weighting and frequency weighting meet, IEC 61672 class 2.
- A & C weighting networks are conformity to standards.
- 0.5" standard out size of the microphone.
- Time weighting (Fast & Slow) dynamic characteristic modes.
- AC / DC output for system expansion.
- External calibration VR.
- Condenser microphone for high accuracy & long-term stability.
- MAX. HOLD function for stored the maximum value.
- Warning indicator for over and under load.
- Low battery indicator.
- LCD display for low power consumption & clear read-out even in bright ambient light condition.
- Used the durable, long-lasting components, including a strong, light weight ABS-plastic housing case.
- Pocket and light weight design allow one hand operation.
- Power by 006P DC 9V battery or DC 9V adapter.

Model	SL-4030
Display	LCD size: 49 mm x 25.5 mm, Digit size: 21.7 mm x 8.8 mm.
Measurement Range	A Weighting- 3 ranges, 30 to 130 dB. C Weighting- 3 ranges, 30 to 130 dB.
Resolution	0.1 dB.
Function	dB (A & C weighting), Time weighting (Fast, Slow), Max. hold, AC output, DC output.
Accuracy (23± 5°C)	Frequency weighting meet IEC 61672 class 2, calibrating input signal on 94 dB (31.5 Hz to 8 kHz), the accuracy of frequency weighting is specified as following: 31.5 Hz - ± 3.5 dB; 63 Hz - ± 2.5 dB; 125 Hz - ± 2.0 dB; 250 Hz - ± 1.9 dB; 500 Hz - ± 1.9 dB; 1 kHz - ± 1.4 dB; 2 kHz - ± 2.6 dB; 4 kHz - ± 3.6 dB; 8 kHz - ± 5.6 dB.
Frequency	31.5 to 8,000 Hz.
Microphone Type	Electric condenser microphone.
Microphone Size	Out size, 12.7 mm Dia. (0.5 inch).
Weighting Network	Characteristics of A & C.
Range selector	ranges (30 to 80dB, 50 to 100dB, 80 to 130dB). * 50 dB on each step, * with over/under range indicating.
Time weighting (Fast, Slow)	Fast - $t = 200$ ms, Slow - $t = 500$ ms * "Fast" range is simulated the human ear response time. * "Slow" range is easy to get the avg. values of vibration sound level. * The "Fast" & "Slow" response range are designed to meet IEC 61672 class 2 requirement.
Calibrator	B & K (Bruel & kjaer), Multifunction Acoustic Calibrator 4226.
Output Signal	AC output - AC 0.5 Vrms corresponding to each range step. DC output - DC 0.3 to 1.3 VDC, 10 mV / per dB. Output impedance - 600 ohm.
Output terminal	3.5 mm dia. phone output terminal is provided for connection with analyzer, level recorder, tape recorder.
Operating Temp.	0 to 50 °C
Operating Humidity	Less than 80% R.H.
Power Supply	006P DC 9V battery (heavy duty type) or DC 9V adapter input.
Power Consumption	Approx. DC 10 mA.
Weight	213 g/0.5 LB.
Dimension	200 x 69 x 28 mm (7.9x2.7x1.4 inch).
Accessories Included	* Instruction manual: 1PC
Optional Accessories	* Sound calibrator (94dB), SC-941. * Sound calibrator (94/114dB), SC-942. * Wind shield ball, SB-01 * AC to DC 9V adapter.



DT-2236

**DT-2236, Digital Tachometer, Photo/Contact**

- World's patent, Multi-functions, one instrument combine Photo Tach. (RPM) & Contact Tach. (RPM, m/min., ft/min.).
- Wide measuring range from 0.5 to 100,000 RPM.
- 0.1 RPM resolution for the measured value < 1000 RPM.
- High precision with 0.05% accuracy.
- The last value, max. value, min. value will be stored into the memory automatically & can be obtained by pressing MEMORY CALL BUTTON.
- High visible LCD display gives RPM reading exactly with no guessing or errors & saves battery energy.
- This tachometer used the exclusive one chip MICRO-COMPUTER LSI circuit and crystal time base, offer the high accurate measurement and fast sampling time.
- The use of durable, long lasting components, including a strong, light weight ABS plastic housing, assures almost maintenance free performance for many years.
- The housing cabinet has been carefully shaped to fit comfortable in either hand.

Model	DT-2236
<b>Measurement &amp; Range</b>	Photo Tachometer: 5 to 99,999 RPM.
	Contact Tachometer: 0.5 to 19,999 RPM.
	Surface Speed: m/min. – 0.05 to 1,999.9 m/mi, ft/min. – 0.2 to 6,560 ft/min.
<b>Resolution</b>	RPM: 0.1 RPM (< 1,000 RPM), 1 RPM (1,000 RPM).
	m/min.: 0.01m/min. (< 100 m/min.), 0.1m/min. (100 m/min.).
	ft/min.: 0.1 ft/min. (< 1,000 ft/mn.), 1 ft/min. (1,000 ft/mn.).
<b>Display</b>	5 digits, 10 mm (0.4") LCD.
<b>Accuracy</b>	± (0.05% + 1 digit).
<b>Time base</b>	Quartz crystal.
<b>Circuit</b>	Exclusive one-chip of microcomputer LSI circuit.
<b>Operating Temp.</b>	0 to 50°C (32 to 122°F).
<b>Operating Humidity</b>	Less than 80 % R.H.
<b>Memory</b>	Last/Max./Min. value.
<b>Battery</b>	4 x 1.5V AA (UM-3) batteries.
<b>Power Consumption</b>	Photo type: Approx. DC 153 mA.
	Contact type: Approx. DC 10 mA.
<b>Size</b>	195 x 61 x 38.5 mm. (7.6 x 2.4 x 1.5 inch).
<b>Weight</b>	280g (0.61 LB) * including batteries.
<b>Standard Accessories</b>	* Carrying case: 1 PC. * Reflecting tape marks (600mm): 1 PC. * RPM adapter (CONE): 1 PC * RPM adapter (FUNEL): 1 PC * Surface speed test wheel: 1 PC * Operation manual: 1 PC





39240

**39240, Waterproof Thermometer, -40°C to +200°C**

Pocket-size with MAX/MIN recording.

- 2.75" (70mm) Stainless steel stem.
- °C/°F switchable ranges of -40 to 392°F (-40 to 200°C).
- MAX/MIN recall of high and low temperatures.
- Data Hold and Auto power Off features.
- Range: -40 to 392°F (-40 to 200°C).  
Basic accuracy: ±2°F/1°C.  
Resolution: 0.1°/1° resolution.
- Digital display with 0.1° resolution.
- Dimensions: 5.9 x 0.8 x 0.7" (150 x 20 x 18mm).
- Weight: 0.7oz (20g).
- Complete with one LR44 button battery and protective cover.



39272

**39272, Pocket Fold-up Thermometer, -50°C to +300°C**

4.5" stainless steel probe adjusts from 0 to 180° with detents at 45°, 90°, 135° and 180°.

- Wide °C/°F switchable temperature range -58 to 572°F (-50 to 300°C).
- Fold up probe 4.5" (114mm) adjusts from 0° to 180° for best measurement and viewing angle.
- Large LCD display with 0.1 degree resolution.
- Auto power off after 1 hour or when probe is placed in stored position.
- Data Hold and Min/Max recordings.
- Fast response time — one second under normal conditions.
- Complete with wrist strap and one AAA battery.

Model	39272
Range	-58 to 572°F (-50 to 300°C)
Accuracy	±1.8°F (-22 to 482°F); ±1°C (-30 to 250°C)
Resolution	0.1°/1° resolution
Dimensions	6.1 x 2.0 x 0.8" (154 x 50 x 20mm)
Weight	2.5oz (71g)



392050

**392050, Dual Stem Thermometer**

Choice of Flat Surface or Penetration Stem Thermometer, For use in liquids, semi-solids and solids.

- Temperature range: -58 to 302°F (-50 to 150°C).
- Basic Accuracy of 2°F or 1°C.
- 0.1° resolution to 199.9; 1° over 200°.
- ON/OFF switch saves battery life.
- Auto power off after 1hr of non use.
- Dimensions: 5" (130mm) stainless steel probe with 2" (54mm) dial.
- Weight: 1oz (29g); 1.3oz (30g) with protective sheath.
- Includes 1.5V button battery, and plastic protective sheath with pocket clip.



401014

### 401014, Indoor/Outdoor Thermometer, -50°C to +70°C

Built-in memory stores Minimum and Maximum Temperature readings

- Large LCD displays 1" (25mm) digits for indoor/outdoor temp.
- Indoor Range: 14 to 140°F (-10 to 60°C).  
Outdoor Range: -58 to 158°F (-50 to 70°C).  
Basic accuracy: ±1.8°F /1°C.  
Resolution: 0.1°F/°C.
- Dimensions: 4.4x4x0.9" (112x102x22mm); Weight: 6.5oz (186g).
- Complete with weatherproof temperature sensor with 9.6ft (3m) thin cable, stand, AAA battery, and wall mounting bracket.
- °F/°C Switchable.



8891

### 8891, Waterproof Thermometer w/probe, -10°C to +110°C

- The most cost effective waterproof temperature monitor with super large lcd and long probe.
- 0.1 degree resolution and high accuracy.
- Ip67 waterproof meter and external probe.
- Wall mounted design for long time using.
- Temp. unit °c/of switchable.
- Powered by 4 alkaline AAA batteries with long battery life time.
- Easy to replace battery.
- Stainless long & durable external probe
  - length: 0.5m
  - diameter: 5mm
  - handle length(nylon+glass fiber): 65mm
  - cable length(silicon): 1.5m
- Low battery indicator.

#### Optional: External Probe

P/N: VZ889PNL

Diameter: 5mm Length: 500mm  
Handle length: 65mm  
Cable length: 1500mm.



Safe, Quick and Easy to read the boiler temperature in faraway place!



Stainless probe holder included in standard package to offer you steady probe support!

Model	8891
Temp. Range (thermistor)	-10~110°C( -50~230°F)
Temp. Resolution	0.1°C(0.1°F)
Temp. Accuracy	+/-1°C(+/-1.6°F)
Temp. Response time	2 minutes typical
LCD update time	10 seconds
LCD size (mm, HxW)	45x96
Operating temp.	0~50°C
Operating RH%	Humidity <80%
Storage temp.	-20~50°C
Storage RH%	Humidity <90%
Meter Dimension(mm,LxWxT)	122x85x30
Meter Weight	~200g
Probe size(mm) Length Diameter Handle length(mm) Cable length(mm)	500 5 65 1500
Probe Weight	~80g
Battery	AAA ALKALINEx 4pcs
Standard Package	Meter, probe, probe holder, battery, manual, plain box
Optional Accessory	External probe



TM-5005

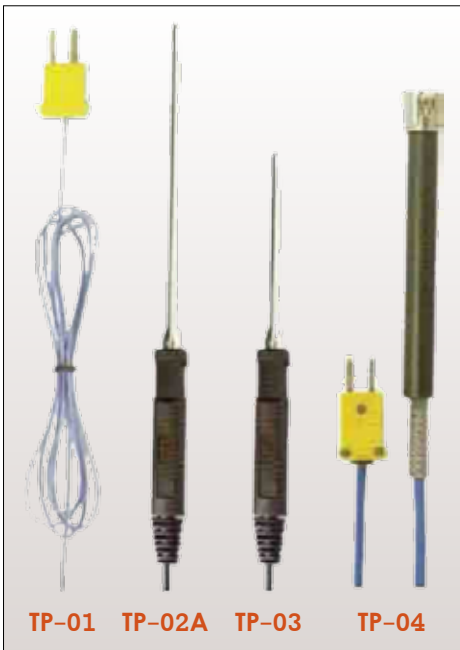
**TM-5005/5007, Heavy Duty Thermometer, -50°C to +1300°C**

Type K Thermometers with single or dual input direct or differential measurements to 0.1°.

- Rugged design for field use – includes rubber holster.
- Dual input model provides differential readings.
- Accurate to 0.3%, °C/°F switchable.
- Front panel offset adjustment to optimize accuracy.
- Displays Maximum reading plus Data Hold on large LCD display.
- Includes 9V battery, holster with stand, wrist strap and temperature probe.

**Accessories:** Temperature probes: TP-01, TP-02, TP-03, TP-04.

Model	TM-5005	TM-5007
<b>Temperature Range</b>	-58 to 2000°F (-50 to 1300°C)	
<b>Temperature Accuracy</b>	(0.3% rdg + 1°C/2°F) >1000°C (0.5%)	
<b>Max resolution</b>	0.1° or 1°	
<b>Dimensions</b>	6.5x3.0x1.7" (165x76x43mm including holster)	
<b>Weight</b>	14.2oz (403g)	
<b>Input</b>	Single Input	Dual Input



TP-01 TP-02A TP-03 TP-04

**TP-01/02A/03/04, Temperature Probes, Type K**

Model	Range	Accuracy
<b>TP-01</b>	* Max. short-term operating Temperature: 300°C (572°F). * It is an ultra fast response naked-bead thermocouple suitable for many general purpose application.	± 0.4 %
<b>TP-02A Thermocouple</b>	* Measure Range: -50°C to 900°C, -50°F to 1650°F. * Dimension: 10cm tube, 3.2mm Dia.	± 0.75 %
<b>TP-03 Thermocouple</b>	* Measure Range: -50°C to 1200°C, -50°F to 2200°F. * Dimension: 10cm tube, 8mm Dia.	± 0.4 %
<b>TP-04 Surface</b>	* Measure Range: -50°C to 400°C, -50°F to 752°F. * Size: Temp. sensing head – 15 mm Dia. Probe length – 120 mm.	± (0.75 % + 0.5°C)



TP-05

**TP-05, Clamp Temperature Probe, -50°C to +350°C**

- Clamp Type K Temp. probe, allows for hands-free super-heat (super-cooling) temperature measurement. The useful Temp. probe, ideal for pipe surface temperature, heating, ventilating, air conditioning, engine or cylinder circular tube.
- Measurement range: -50 to 350°C, -58°F to 662°F.
- Accuracy: 2.5°C, 4.5°F.
- Spring-loaded jaw for secure grip for pipe size from 3 mm to 48 mm diameter.
- Cooperate for any Thermometer with a Type K thermocouple input.
- Cable length: 2 meters coiled cable.



**TM-747D**

### TM-747D, Datalogger Thermometer 4 Channels Include Software/ Cable

The TM-747D is a rugged, easy-to-use thermometer with 4 mini, flat-pin, thermocouple sockets for inputs. It accepts 7 different thermocouple types and displays all 4 inputs at the same time. It also provides differential temperature measurement readings of T3-T4, as well as individual readings of the 4 inputs. Other features are a low battery indicator, perpetual calendar, and auto power-off.

- Multi function for K/J/E/T/R/S/N types.
- 4 Backlit Displays.
- Resolution 0.1°C/0.1°F, 1°C/1°F.
- Auto Power-Off, Low Battery Indication.
- USB Interface with Windows Software (Optional RS232 Cable Available).
- 10,000 Record Datalogger.
- CALL-Fit to Quick- Read Memory Data (50 Pages/Second).
- Perpetual Calendar Function.
- Input protection at thermocouple input: 24V AC/DC Maximum.
- Dimension (Includes housing) (mm): L184 x W82 x H44.
- Weight (Includes housing, batteries): Approx. 450g.
- Battery Life: 4 "AAA" batteries (included), 550 hr.

Sensor Type	°C		°F	
	Thermocouple Range	Accuracy (18 to 28°C Ambient)	Thermocouple Range	Accuracy (18 to 28°C Ambient)
<b>K</b>	-100 ~ 1300	±0.1% rdg + 0.7°C	-148 ~ -2372	±0.1% rdg + 1.4°F
<b>J</b>	-100 ~ 1000	±0.1% rdg + 0.7°C	-148 ~ 1832	±0.1% rdg + 1.4°F
<b>E</b>	-50 ~ 800	±0.1% rdg + 0.7°C	-58 ~ 1472	±0.1% rdg + 1.4°F
<b>T</b>	-100 ~ 400	±0.1% rdg + 0.7°C	-148 ~ 752	±0.1% rdg + 1.4°F
<b>R/S</b>	0 ~ 1700	± 0.1% rdg + 2°C	32 ~ 3092	±0.1% rdg + 4°F
<b>N</b>	-100 ~ 1300	± 0.1% rdg + 1.5°C	-148 ~ 2372	± 0.1% rdg + 3°F

• Operating Temperature and Humidity: 0 to 50°C (32 to 122°F) 0 to 80% RH  
 • Storage Temperature and Humidity: -20 to 60°C (-4 to 140°F) 0 to 80% RH



**PROVA 800**

### PROVA 800, 8 Input Thermometer / Datalogger

- 8 input temperature measurement/logging °C/°F
- Graphic display of each input
- 11 types of thermocouple (K, J, E, T, R, S, N, L, U, B, C)
- Easy thermocouple mini connector
- Basic accuracy 0.05% ±1°C (Ktype)
- Sampling Rate: 1 sec./8 input
- Programmable Hi-La alarm for 8 inputs
- Display of max and min values of 8 inputs
- Standard 2G SD memory card (stores 3.8-year data)
- Optional 8G SDHC memory card
- SD card directly read by PC
- Easy data file management (Read and Delete functions)
- Built-in calendar clock
- Independent Input Setup (type of thermocouple, Hi-Lo alarm values, name of Engineering Unit)
- Isolated Input Protection of 350Vp-p between any two inputs
- Programmable Engineering Unit (E.U.) to integrate Analog Output (-50 to 50mV) from instruments
- Screen hardcopy into files
- Paperless Recorder.

Sensor Type	°C		°F	
	Range	Accuracy	Range	Accuracy
<b>K</b>	-200 ~ -100 -100 ~ -1370	±2.0°C ±0.05% ±1.0°C	-328 ~ -148 -148 ~ -2498	±3.6°F ±0.05% ±1.8°F
<b>J</b>	-200 ~ -100 -100 ~ 100 100 ~ 1000	±2.5°C ±1.5°C ±0.05% ±1.0°C	-328 ~ -148 -148 ~ 212 212 ~ 1832	±4.5°F ±2.7°F ±0.05% ±1.8°F
<b>E</b>	-150 ~ -100 -100 ~ 760	±2.0°C ±0.05% ±1.0°C	-238 ~ -148 -148 ~ 1400	±3.6°F ±0.05% ±1.8°F
<b>T</b>	-200 ~ -100 -100 ~ 400	±1.5°C ±0.1% ±0.5°C	-328 ~ -148 -148 ~ 752	±2.7°F ±0.1% ±0.9°F
<b>R/S</b>	0 ~ 100 100 ~ 300 300 ~ 1600	±5.0°C ±3.0°C ±0.05% ±2.0°C	32 ~ 212 212 ~ 572 572 ~ 2912	±9.0°F ±5.4°F ±0.05% ±3.6°F
<b>N</b>	0 ~ 1300	±0.1% ±1.0°C	32 ~ 2372	±0.1% ±1.8°F
<b>L</b>	-200 ~ 900	±0.1% ±1.0°C	-328 ~ 1652	±0.1% ±1.8°F
<b>U</b>	0 ~ 600	±0.1% ±1.0°C	32 ~ 1112	±0.1% ±1.8°F
<b>B</b>	600 ~ 1820	±0.05% ±2.0°C	1112 ~ 3308	±0.05% ±3.6°F
<b>C</b>	0 ~ 2310	±0.1% ±1.5°C	32 ~ 4190	±0.1% ±2.7°F
<b>mV</b>	-50 ~ 50	±0.05% ±20µV	-50 ~ 50	±0.05% ±20µV



### BTM-4208SD, 12 Channels Temp. Recorder, SD Card, Real Time Datalogger, Patent

- 12 channels Temperature recorder, use SD card to save the data along with time information, paperless.
- Real time datalogger, save the 12 channels Temp. measuring data along the time information (year, month, date, minute, second) into the SD memory card and can be down load to the Excel, extra software is no need. User can make the further data or graphic analysis by themselves.
- Channels no.: 12 channels (CH1 to CH12) temperature measurement.
- Sensor type: Type J/K/T/E/R/S thermocouple.
- Auto datalogger or manual datalogger. Datalogger sampling time range: 1 to 3600 seconds
- Type K thermometer: -100 to 1300°C.
- Type J thermometer: -100 to 1200°C.
- Page select, show CH1 to CH8 or CH9 to CH12 in the same LCD.
- Display resolution: 1 degree/0.1 degree.
- Offset adjustment.
- SD card capacity: 1 GB to 16 GB.
- RS232/USB computer interface.
- Microcomputer circuit provides intelligent function and high accuracy.
- Jumbo LCD with green light backlight, easy reading.
- Can default auto power off or manual power off
- Data hold to freeze the measurement value.
- Record function to present the max. and min. reading.
- Power by UM3/AA (1.5V) x 8 batteries or DC 9V adapter.
- RS232/USB PC COMPUTER interface
- Heavy duty & compact housing case.

BTM-4208SD

Model	BTM-4208SD	
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.	
<b>Display</b>	LCD size : 82 mm x 61 mm. * with green color backlight.	
<b>Channels</b>	12 channels : T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11 and T12.	
<b>Sensor type</b>	Type K thermocouple probe. Type J/T/E/R/S thermocouple probe.	
<b>Resolution</b>	0.1°C/1°C, 0.1°F/1 °F.	
<b>Datalogger Sampling Time</b>	Auto	1 second to 3600 seconds @ Sampling time can set to 1 second, but memory data may loss.
	Manual	Push the datalogger button once will save data one time. @ Set the sampling time to 0 second.
<b>Memory Card</b>	SD memory card. 1 GB to 16 GB.	
<b>Advanced setting</b>	* Set clock time (Year/Month/Date, Hour/Minute/Second) * Decimal point of SD card setting * Auto power OFF management * Set beep Sound ON/OFF * Set temperature unit to °C or °F * Set sampling time * SD memory card Format	
<b>Temp. Compensation</b>	Automatic temp. compensation for the type K/J/T/E/R/S thermometer.	
<b>Linear Compensation</b>	Linear Compensation for the full range.	
<b>Offset Adjustment</b>	To adjust the zero temperature deviation value.	
<b>Probe Input Socket</b>	2 pin thermocouple socket.	
<b>Over Indication</b>	Show " - - - - ".	
<b>Data Hold</b>	Freeze the display reading.	
<b>Memory Recall</b>	Maximum & Minimum value.	
<b>Data Output</b>	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
<b>Sampling Time of Display</b>	Approx. 1 second.	
<b>Power off</b>	Auto shut off saves battery life or Auto shut off saves battery life or manual off by push button.	
<b>Operating Temperature</b>	0 to 50°C	
<b>Operating Humidity</b>	Less than 85% R.H.	
<b>Power Supply</b>	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent	
	* DC 9V adapter input. (AC/DC power adapter is optional)	
<b>Power Current</b>	Normal operation ( w/o SD card save data and LCD Backlight is OFF) : Approx. DC 7.5 mA	
	When SD card save the data and LCD Backlight is OFF) : Approx. DC 25 mA.	
	* Alf LCD backlight on, the power consumption will increase approx. 11 mA.	
<b>Weight</b>	Meter : 948g (includes batteries)	
<b>Dimension</b>	225 X 125 X 64 mm (8.86 X 4.92 X 2.52 inch)	
<b>Accessories Included</b>	* Instruction manual: 1PC * Type K Temp. probe, TP-01: 2 PC * SD Card (2GB): 1 PC * Hard carrying case, CA-08: 1PC	
<b>Optional Accessories</b>	* Type K thermocouple probe. TP-01, TP-02A, TP-03, TP-04 * USB cable, USB-01. * RS232 cable, UPCB-02. * Data Acquisition software, SW-U811-WIN. * AC to DC 9V adapter.	

### Electrical Specifications (23±5°C):

Sensor Type	Resolution	Range	Accuracy
Type K	0.1°C	-50.0 to 100.0°C / -50.1 to -999.9°C	± (0.4 % + 1°C) / ± (0.4 % + 0.5°C)
	1°C	1000 to 1300°C	± (0.4 % + 1°C)
	0.1°F	-58.0 to 148.0°F / -58.0 to -999.9°F	± (0.4 % + 1.8°F) / ± (0.4 % + 1°F)
	1°F	-1000 to 2372°F	± (0.4 % + 2°C)
Type J	0.1°C	-50.0 to 100.0°C / -50.1 to -999.9°C	± (0.4 % + 1°C) / ± (0.4 % + 0.5°C)
	1°C	1000 to 1150°C	± (0.4 % + 1°C)
	0.1°F	-58.0 to 148.0°F / -58.0 to -999.9°F	± (0.4 % + 1.8°F) / ± (0.4 % + 1°F)
	1°F	1000 to 2102°F	± (0.4 % + 2°C)
Type T	0.1°C	-50.1 to 100.0°C / -50.0 to -400.0°C	± (0.4 % + 1°C) / ± (0.4 % + 0.5°C)
	0.1°F	-58.1 to 148.0°F / -58.0 to -752.0°F	± (0.4 % + 1.8°F) / ± (0.4 % + 1°F)
Type E	0.1°C	-50.1 to 100.0°C / -50.0 to -900.0°C	± (0.4 % + 1°C) / ± (0.4 % + 0.5°C)
	0.1°F	-58.1 to 148.0°F / -58.0 to -999.9°F	± (0.4 % + 1.8°F) / ± (0.4 % + 1°F)
	1°F	1000 to 1652°F	± (0.4 % + 2°F)
Type R	1°C	0 to 600.0°C / 601 to 1700.0°C	± (0.4 % + 0.5°C) / ± (0.4 % + 1°C)
	1°F	32 to 1112°F / 1113 to 3092°F	± (0.4 % + 1°F) / ± (0.4 % + 2°F)
Type S	1°C	0 to 600.0°C / 601 to 1500.0°C	± (0.4 % + 0.5°C) / ± (0.4 % + 1°C)
	1°F	32 to 1112°F / 1113 to 2732°F	± (0.4 % + 1°F) / ± (0.4 % + 2°F)

Remark:

- a. Accuracy value is specified for the meter only.
- b. Accuracy is tested under the meter's environment temperature within 23 ± 5°C.
- c. Linearity Correction: Memorize the thermocouple's curve into the intelligent CPU circuit.



### VIR50, Digital Laser Video IR Thermometer, -50°C to +2200°C

2.2" Color TFT LCD and Built-in Camera with a microSD card for capturing images (JPEG) and video for viewing on your PC.

- Dual laser indicates ideal measuring distance where the two laser points converge to a 1" target spot
- Fast 150 millisecond response time
- Color LED bargraph for viewing trends
- Body Temperature Function for quickly detecting elevated body (forehead) temperature
- Type K Thermocouple input
- Air Temperature and Relative Humidity measurement
- Adjustable emissivity increases measurement accuracy for different surfaces
- Adjustable High/Low set points with audible alarm alerts user when temperature exceeds the programmed set points
- MAX/MIN/AVG/DIF functions
- Trigger lock function for continuous readings
- USB interface
- Auto power off
- Double molded housing
- Complete with microSD card, general purpose Type K bead wire probe, USB cable, rechargeable 3.7V battery, and carrying case.

Model	VIR50
Laser Convergence Distance	50" (127cm)
IR Temperature Range	-58 to 3992°F (-50 to 2200°C)
Repeatability	±0.5% or 1.8°F/1°C
Basic Accuracy	±(1% of rdg + 2°F/1°C)
Max resolution	0.1°F/°C
Emissivity	0.10 to 1.00 Adjustable
Field of View (Distance to Target)	50:1
Type K Temperature Range	-58 to 2498°F (-50 to 1370°C)
Air Temperature Range	32 to 122°F (0 to 50°C)
Relative Humidity	0 to 100%RH
Dimensions	7.4x6.0x2.2" (189x152x57mm)
Weight	17.4oz (494g)
Ordering	* VIR50 Dual Laser Video IR Thermometer * BATT-37V - Rechargeable 3.7V battery



**42510A, -50°C to 650°C, 12:1, Compact Laser IR, Thermometer**

Compact thermometer measures up to 650°C (1200°F) with high accuracy

- Adjustable high/low visual and audible alarm
- Adjustable emissivity for better accuracy on different surfaces
- MAX/MIN features display highest and lowest values
- Built-in laser pointer identifies target area
- Backlighting
- Over-range indicator
- Automatic Data Hold when trigger released
- Auto power off
- Complete with 9V battery and pouch case

Model	42510A
IR Temperature (Non-contact)	-25 to 1200°F (-50 to 650°C)
Basic Accuracy	±(1% of reading + 2°F/1°C)
Max. Resolution	0.1°F/°C; 1°F/°C
Emissivity	0.1 to 1.00 Adjustable
Repeatability	Repeatability ±0.5% or ±1.8°F/°C
Field of view (Distance to Target)	12:1
CE approved	Yes
Dimensions	3.2x1.6x6.3" (82x42x160mm)
Weight	6.4oz (180g)



**42512, Dual Laser, -50°C to 1000°C, 30:1, IR Thermometer**

Fast response and accurate measurements

- Dual laser simplifies distance-to-target ratio—no more calculations!
- Accurate measurements at 30" distance
- Fast 150 millisecond instantaneous response for capturing spikes in temp.
- Max mode captures and holds rapidly changing temperatures
- Lock function for continuous readings
- White backlit dual LCD display
- Adjustable emissivity increases measurement accuracy for different surfaces
- Double molded housing
- Adjustable High/Low set points with audible alarm alerts user when temperature exceeds the programmed set points
- Complete with carrying case and 9V battery

Model	42512
Laser Convergence Distance	30" (76.2cm)
Range	-58 to 1832°F (-50 to 1000°C)
Basic Accuracy	±(1% of rdg + 2°F/1°C)
Max. Resolution	0.1°F/°C
Repeatability	±0.5% or 1.8°F/1°C
Emissivity	0.10 to 1.00 Adjustable
Field of view (Distance to Target)	30:1
CE approved	Yes
Dimensions	5.7x4x1.6" (146x104x43mm)
Weight	5.7oz (163g)



42540

**42540, High Temperature IR Thermometer, -50°C to 760°C**

Measures surface temperature up to 1400°F (760°C), With built-in Laser Pointer that identifies target area and improves aim.

- High temperature range from -58° to 1400°F (-50 to 760°C)
- 16 to 1 distance to target ratio measures smaller surface areas at greater distances
- Adjustable high/low alarm alerts user visually and audibly when temperature exceeds programmed limits
- Adjustable emissivity for better accuracy on different surfaces
- MAX/MIN/AVG/DIF features display highest, lowest, average, and MAX minus MIN values
- Large backlit display
- Laser pointer identifies target area
- Automatic Data Hold
- Automatic Power Off
- High Resolution of 0.1° up to 199.9°
- Complete with 9V battery and hard carrying case.

Model	42540
IR Temperature Range	-58 to 1400°F (-50 to 760°C)
Basic Accuracy	$\pm 2\% \text{rdg}$ or $4^\circ\text{F}(2^\circ\text{C}) < 932^\circ\text{F}(500^\circ\text{C})$ ; $\pm (2.5\% \text{rdg} + 5^\circ) > 932^\circ\text{F}(500^\circ\text{C})$
Max resolution	0.1°F/°C
Emissivity	0.10 to 1.00 Adjustable
Field of View (Distance to Target)	16:1
Dimensions	3.9x2.2x9" (100x56x230mm)
Weight	10.2oz (290g)



42570

**42570, High Temperature IR Thermometer, -50°C to 2200°C**

Fast response (100mS) with highest accuracy at point where dual lasers converge plus Type K input and USB interface

- High 50:1 distance to target ratio measures smaller surface areas at greater distances
- Dual Laser Targeting indicates ideal measuring distance when two laser points converge to 1" target spot
- Fast 0.10 second response time
- Tripod mounting feature and Lock function for continuous measurements
- Stores up to 100 readings
- White backlit LCD with bargraph
- MAX/MIN/AVG/DIF functions
- Adjustable emissivity
- Adjustable High/Low set points with audible alarm
- Complete with general purpose Type K bead wire probe, USB cable and PC software, tripod, 9V battery and case.

Model	42570
Laser Convergence Distance	50" (127cm)
IR Temperature Range	-58 to 3992°F (-50 to 2200°C)
Repeatability	$\pm 0.5\%$ or $1.8^\circ\text{F}/1^\circ\text{C}$
Basic Accuracy	$\pm (1\% \text{ of rdg} + 2^\circ\text{F}/1^\circ\text{C})$
Max resolution	0.1°F/°C
Emissivity	0.10 to 1.00 Adjustable
Field of View (Distance to Target)	50:1
Type K Range	-58 to 2498°F (-50 to 1370°C)
Memory	Manually Store/Recall 100 readings
Dimensions	8x6.1x2" (204x155x52mm)
Weight	11.3oz (320g)
Ordering	42570 50" Distance Dual Laser InfraRed Thermometer



**CG204, Coating Thickness Tester**

Automatic recognition for ferrous and non-ferrous substrates



CG204

- Conforms to GB/T 4956-1985, GB/T 4957-1985, JB/T 8393-1996, JJG-889-95, and JJG 818-93.
- Magnetic induction for ferrous substrates.
- Eddy current measurement for non-ferrous substrates.
- Two measuring modes (Single and Continuous) and Working modes (Direct and Group).
- Memory stores 400 readings: 80 Direct and 320 Group.
- User adjustable high/low alarms, Min/Max/Average, One or two point calibration.
- USB interface includes software.
- Complete with two AAA batteries, USB cable, software, Calibration Iron, Calibration Aluminum, Reference Films, and carrying case.

Specification	Ferrous Probe	Non-Ferrous Probe
<b>Working Principle</b>	Magnetic Induction	Eddy Current
<b>Measuring Range</b>	0 to 1250μm; 0 to 49mils	0 to 1250μm; 0 to 49mils
<b>Basic Accuracy</b>	±3%	±3%
<b>Resolution</b>	0.1μm (0.004mils)	0.1μm (0.004mils)
<b>Min. Curvature Radius</b>	1.5mm (59.06mils)	3mm (118.1mils)
<b>Minimum Diameter</b>	7mm (275.6mils)	5mm (196.9mils)
<b>Minimum Thickness</b>	0.5mm (19.69mils)	0.3mm (11.81mils)
<b>Dimensions</b>	4.7 x 2.4 x 1.25" (120 x 62 x 32mm)	
<b>Weight</b>	6.17oz (175g)	
<b>Ordering</b>	* CG204 - Coating Thickness Tester * CG204-REF - Replacement Reference Films for CG204 (10 sets)	

**DC-515, Digital Caliber, 0 to 150mm**



DC-515

Model	DC-515
<b>Display</b>	* 4.7 mm (0.19") LCD, 6 digits. * "-" for minus sign. * "mm" for mm measuring unit. * "IN" for inch measuring unit.
<b>Measurement range</b>	0 to 150 mm (0 to 6 inch).
<b>Resolution/Accuracy</b>	0.01 mm/0.0005 inch. / ± 0.03 mm/0.0015 inch.
<b>Max. measuring speed</b>	1.5 m/sec., 60 inch/sec.
<b>Measuring unit</b>	Inch & mm, changed by pushing the button, true conversion.
<b>Zero setting</b>	Zero setting at any position within the measuring range.
<b>Polarity</b>	Automatic switching, '-' indicates negative polarity.
<b>Operating/Storage Temp.</b>	0°C to 40°C (32°F to 104°F)/-20°C to 70°C (-4°F to 194°F)
<b>Operating Humidity</b>	Less than 80% R.H.
<b>Power Supply</b>	One battery, 1.5V, silver oxide.
<b>Power Consumption</b>	Approx. DC 18 uA. Battery approx. Approx. 5000 hours for continuous use.
<b>Data output</b>	Serial output for computer interface & printer.
<b>Weight/Dimension</b>	Approx. 145 g/0.32 lb. / Length 237 mm(9.4 inch).
<b>Data output</b>	Serial output for computer interface & printer.
<b>Standard Accessories</b>	* Instruction manual: 1PC * Carrying case: 1 PC * Battery (1.5 V, silver-oxide): 1 PC

**DC-516, Digital Micrometer, 0 to 25mm**



DC-516

Model	DC-516
<b>Display</b>	* LCD size: 32mm x 11mm, 6 digits. * "mm" for mm measuring unit. * "in" for inch measuring unit.
<b>Measurement range</b>	0 to 25 mm (0 to 1 inch).
<b>Resolution/Accuracy</b>	0.001 mm/0.00005 inch. / 0.002 mm.
<b>Buttons</b>	3 buttons, ON/OFF, ZERO, inch/mm.
<b>Measuring unit</b>	Inch & mm, changed by pushing the button, true conversion.
<b>Zero setting</b>	Zero setting at any position within the measuring range.
<b>Power ON/OFF</b>	Automatic power off or manual power off by pushing the "ON/OFF" button.
<b>Operating/Storage Temp.</b>	0°C to 40°C (32°F to 104°F)/-20°C to 70°C (-4°F to 194°F)
<b>Operating Humidity</b>	Less than 80% R.H.
<b>Power Supply</b>	One silver-oxide button battery SR44 ( 1.5 V ).
<b>Data output</b>	Serial output for computer interface & printer.
<b>Weight / Dimension</b>	Approx. 274 g/0.60 LB. / 157 mm x 56 mm x 22 mm.
<b>Size of square drive</b>	1/4 inch square (6.35 mm square).
<b>Data output</b>	Optional, RS-232 serial computer interface
<b>Standard Accessories</b>	* Instruction manual: 1PC * Carrying case: 1 PC * Battery (1.5 V, silver-oxide SR-44): 1 PC
<b>Operating Procedures</b>	1. Press "ON/OFF" button to power on the micrometer. 2. Press "inch/mm" button to be in Metric or inch system condition. 3. First keep measuring face contact to reset, then press "ZERO" key to display zero

**VC-9200, Vacuum Meter, 1 to 1500mbar**

- Absolute vacuum & absolute pressure measurement.
- Wide measure range from 1 to 1500 mbar.
- Overload protection up to 2000 mbar max.
- Separate probe, easy operation.
- Application : Automobile, Industrial, laboratory, heating, ventilation, medical hospital.
- Heavy duty sensor used for air, oil gas, liquid.
- 8 kind display units (torr, mm Hg, micron, mbar, KPa, Pa, inch Hg, psi) select by push button on the front panel.
- Auto shut off saves battery life.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Records maximum & minimum readings with recall.
- Data Hold function for stored the desired value on display.
- Built-in low battery indicator.
- RS232 PC serial interface, can match the personal computer used as the Datalogger, Recorder.

Model	VC-9200
Display	61 mm x 34 mm supper large LCD display. 15 mm (0.6") digit size.
Display units	8 kind display units : torr, mm Hg, micron, mbar, KPa, Pa, inch Hg, psi.
Circuit	Microprocessor LSI circuit.
Function	Data hold, memory (max., min.)
Sensor probe	* Separate probe, easy operation. * Heavy duty sensor used for vacuum measurement of air, oil gas liquid.
Data hold	By push button.
Data record	Records Maximum & Minimum readings.
Power Off	Auto shut off saves battery life, or manual off by push button.
Data Output	RS 232 PC serial interface.
Sampling Time	Approx. 0.8 second.
Data Output	RS 232 PC serial interface.
Operating Humidity	Less than 80% R.H.
Operating Temp.	0°C to 50°C (32°F to 122°F)
Power Supply	006P DC 9V battery (heavy duty).
Power Current	Approx. DC 6.0 mA.
Pressure Port Connector	1/4" PS
Weight	Instrument: 220 g/0.48 LB.
	Sensor probe: 175 g/0.39 LB.
Dimension	Meter: 180 x 72 x 32 mm (7.1 x 2.8 x 1.3 inch)
	Sensor probe: 90 mm x 30 mm Dia.
Accessories Included	* Instruction manual: 1PC * Hard Carrying case: 1PC * Sensor probe: 1 PC
Optional Accessories	* Data acquisition software (Windows version), SW-U801-WIN * RS232 cable, UPCB-01 * USB cable, USB-01

**Electrical Specifications (23±5°C):**

unit	Max. range	Resolution	Accuracy
mbar	1500 mbar	1 mbar	± 1% F.S. (F.S.: full scale) Note: Included linearity, hysteresis and repeatability
KPa	150.0 KPa	0.1 KPa	
Pa	150,000 Pa	100 Pa	
torr	1125 torr	1 torr	
mm Hg	1125 mm Hg	1 mm Hg	
micron	1125,000 micron	1000 micron	
inch Hg	44.30 inch Hg	0.02 inch Hg	
psi	21.75 psi	0.01 psi	



### PVB-820, Vibration Meter, Pen Type, Acceleration, Velocity, IP-65 Metric & Imperial Unit

- Applications for industrial vibration monitoring: All industrial machinery vibrates. The level of vibration is a useful guide to machine condition. Poor balance, misalignment & looseness of the structure will cause the vibration level increase, it is a sure sign that the maintenance is needed.
- Pen type digital vibration meter, vibration sensor is built in, all in one.
- Acceleration, Velocity measurement, RMS measurement value.
- Metric & Imperial display unit.
- Frequency range 10 Hz - 1 kHz, sensitivity relative meet ISO 2954.
- Microcomputer circuit, intelligent function, high accuracy.
- LCD display, easy read out.
- Complete set with the Test pin and the Magnetic base are the standard accessories.
- Built-in low battery indicator.
- Heavy duty & compact housing case.
- IP65 protection.
- Compact size, light weight.
- Soft carrying case is the optional accessory

Model	PVB-820	
Display	LCD, size : 20 mm x 28 mm.	
Measurement	Velocity, Acceleration. * RMS value.	
Function	Acceleration	m/s <sup>2</sup> , g, ft/s <sup>2</sup>
	Velocity	mm/s, cm/s, inch/s
Frequency range	10 Hz to 1 KHz * Sensitivity relative during the frequency range meet ISO 2954	
Circuit	Exclusive microcomputer circuit.	
Zero adjust	Build in the Zero adjustment VR, easy to make adjustment.	
Data Hold	Freeze the display reading.	
Sampling Time	Approx. 1 second.	
Operating Humidity	Less than 80% R.H.	
Operating Temp.	0°C to 50°C (32°F to 122°F)	
Power Supply	DC 1.5V battery ( UM-4/AAA ) x 4 PCs.	
Power Consumption	Approx. DC 12 mA.	
Weight	489 g/1.08 LB.	
Dimension	Meter: 175 x 40 x 32 mm (6.9 x 1.6 x 1.3 inch). * Meter without sensing head,	
	Sensing head : Round 9 mm Dia. x 30 mm.	
Accessories Included	* Instruction manual: 1PC * Meter with sensing head: 1 Set * Magnetic base: 1 PC * Soft carrying case, CA-52A: 1 PC	

### Electrical Specifications Acceleration (RMS)

Unit	m/s <sup>2</sup>	g @ 1g=9.8 m/s <sup>2</sup>	ft/s <sup>2</sup>
Range	0.5 to 199.9 m/s <sup>2</sup>	0.05 to 20.39 g	2 to 656 ft/s <sup>2</sup>
Resolution	0.1m/s <sup>2</sup>	0.01 g	1 ft/s <sup>2</sup>
Accuracy	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°
Calibration Point	50 m/s <sup>2</sup> (160Hz)	50 m/s <sup>2</sup> (160Hz)	50 m/s <sup>2</sup> (160Hz)

### Velocity (RMS)

Unit	mm/s	cm/s	inch/s
Range	0.5 to 199.9 mm/s	0.05 to 19.99 cm/s	0.02 to 7.87 inch/s
Resolution	0.1 mm/s	0.01 cm/s	0.01 inch/s
Accuracy	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°	± (5% + 2d) reading @ 160 Hz, 80 Hz, 23 ± 5°
Calibration Point	50 mm/s (160Hz)	50 mm/s (160Hz)	50 mm/s (160Hz)



- Standard gasket fits all crops with up to 6mm (0.25") petiole like cotton.
- Optional supply of gasket for citrus leaves, corn, sorghum etc. upon request.

**Specifications:**

- Accuracy: ±1% full scale.
- Size: W355 x D280 x H175mm.
- Weight: 7kg.
- Battery: 9V.
- Data hold.
- Memory record–Max./Min.
- RS-232 output for datalogger option.
- Applicable software windows version.

**Pressure Meter:**

- Certified under ISO-9001, CE, IEC-1010 regulations.
- Can cooperate with various sensors for different plant species (5,10,20,35,70bar).

**Ordering Information:**

Arimad-3000S – □  
5,10,20,35,70

**ARIMAD-3000S, Plant Water Potential Measurement Device for Agricultural use**

- Pressure chamber method demonstrating the plant's reaction to moisture excess or deficiency.
- Enables adjustments of irrigation schedule.

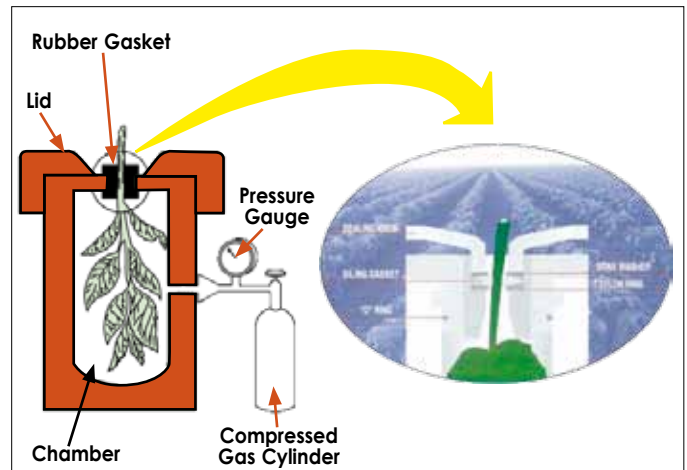
**ARIMAD keeps you in touch with your crop's water status!**

**Provides Indication of:**

- Prevailing soil moisture stress.
- Influence of environmental changes–heat load, humidity, wind, salinity etc.
- Plant moisture stress.
- Changes in growth, proteins & photosynthesis.

**Simple & Short Procedure of 4 Steps:**

1. Selecting a representative leaf.
2. Preparing the instrument.
3. Inserting pressured gas in the chamber.
4. Reading the plant's water potential.



**Low Tension values (~3bar) – High water potential, sufficient water for plant growth.**

**High Tension values (~20bar) – Low water potential, adjustments of water supply needed.**

**Measuring Range:**

Sensor type	5 bar		10 bar		20 bar		35 bar		70 bar	
	Max. range	Resolution	Max. range	Resolution	Max. range	Resolution	Max. range	Resolution	Max. range	Resolution
<b>bar</b>	5	0.005	10	0.01	20	0.02	35	0.05	70	0.1
<b>psi</b>	72.5	0.1	145	0.2	290	0.2	508	1	1015	2
<b>Kg/cm2</b>	5.095	0.005	10.19	0.01	20.40	0.02	35.7	0.05	71.38	0.1
<b>mm/Hg</b>	3750	5	7500	10	15000	20	26252	50	52504.5	100
<b>inch/Hg</b>	147.6	0.1	295.2	0.2	590.5	0.5	1033	1	2067	2
<b>meter/H20</b>	50.95	0.05	101.9	0.1	204.0	0.2	356.9	0.5	713.8	1
<b>inch/HF20</b>	2006	2	4010	5	8020	10	14052	20	28103	50
<b>Atmosphere</b>	4.935	0.005	9.87	0.01	19.74	0.02	34.54	0.05	69.08	0.1



**MZ-3, Video Zoom Microscope**

The quality optical system and the specially coated optical components adopted in MZ3 Video Zoom Microscope furnish it to deliver sharp and flat images. With the locking screw, the zoom knob of the zoom body can be operated more precisely. This product can be applied to viewing, inspecting and testing digital images in electronic components, semiconductor, laser, LED, LCD, industrial and biological fields. Digital Camera, CCD Camera, DSLR and SLR can be attached to MZ3 Video Zoom Microscope by using the relevant adapters.

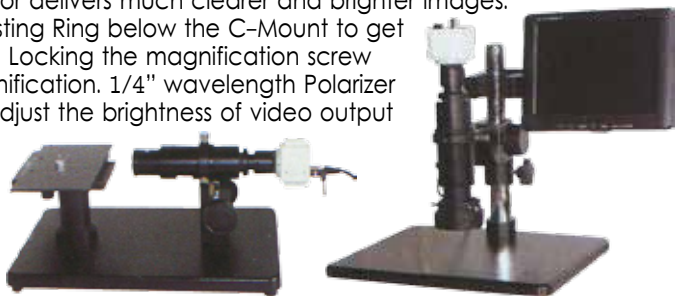
**MZ311101, Micro zoom body**

Based on the best optical system, MZ311101 can deliver clear, bright and flat images. The zoom knob of zoom body with lock-up equipment can reach high precision. It can apply to modern electronic equipment, semiconductor, laser, LED, LCD, industry inspection, digital observation on biology and other fields.

**MZ311102, Micro zoom body**

MZ311102 Monocular Video Zoom microscope equipped with optional LED Coaxial Illuminator delivers much clearer and brighter images. Adjust CTV Adjusting Ring below the C-Mount to get the clear image. Locking the magnification screw can fix the magnification. 1/4" wavelength Polarizer Lens is used to adjust the brightness of video output and get the best contrast.

**Options for MZ-3**



**MZ3-7001-A Video Zoom Microscope Includes:**

MZ311101 0.7-5X Micro Zoom Body, MZ313104 1.0X Objective Lens, MA237102 Horizontal Big Base Stand, GP020101 1/3" Color CCD Camera, GP070101 12V Power Supply and GP080101 BNC-BNC Video Cable.

**Specifications for MZ311101:**

- Zoom Range: 0.7X-5X.
- Zoom Ratio: 1: 7.
- Magnification: 16X-160X.
- Field of View: 2.14mm-21.4mm.
- Working Distance: 100mm-105mm.

**Specifications for MZ311102:**

- Zoom Range: 1X-7X.
- Zoom Ratio: 1: 7.
- Magnification: 23.7X-232.3X.
- Field of View: 1.53mm-15mm.
- Working Distance: 100mm-105mm.
- LED Coaxial Illuminator.

**Application:**

Adjusting CTV Adjusting Ring below the C-Mount will obtain a clear image. Locking the magnification screw can fix the magnification. 1/4" wavelength polarizer lens is used to adjust the brightness of video output and get the best contrast.

	Model	Name	Description
	MZ311101	Micro zoom body	Zoom body with 0.7X-5X zoom range; The outside dia. of body: 48mm
	MZ311102	Micro zoom body	Zoom range of zoom body 1 X-7X with LED coaxial illuminator; The outside dia. of body: 48mm
	MZ313104	1X Objective Lens	1X Objective, working distance: 105mm, for MZ3 Series microscope
	MZ313107	1.4X Objective Lens	1.4X Objective, working distance: 100mm, for MZ3 Series microscope
	MZ314101	1/4 Wavelength Polarizer Lens	For MZ313107, 1.4X objective lens

**Optical Specifications:** Based on 14" Monitor & 1/3" CCD Camera

Model		MZ31110101		MZ31110102	
Objective Lens	Working Distance (mm)	Coupler			
		0.4X			
		Mag.	FOV (mm)	Mag.	FOV (mm)
1X	105	16X-114.3X	21.4-3	23.7X-166X	15-2.14
1.4X	100	22.4X-160X	15.3-2.14	33.2X-232.3X	10.7-1.53



## SMZ-171 The Next Generation Stereo Microscope

- ESD and non ESD version
- Greenough optic system
- Compact and rugged
- Light weight
- Anti fungus
- Interlock eyepieces tube
- 3W LED Transmitted/Incident Illumination
- Power supply (100-240V)
- Long lasting bulb, life up to 25,000 hrs.



Model	SMZ-171BL	SMZ-171TL
<b>Optical system</b>	Greenough	
<b>Observation angle</b>	45°/ 60°	45°
<b>Magnification range (standard)</b>	0.75X—5X	
<b>Zoom ratio</b>	1:6.7	
<b>Eyepiece</b>	N-WF, high eye-point 10X(Ø23), Diopter adjustable N-WF 12.5X(Ø18), 15X(Ø16), 20X(Ø13) optional	
<b>Interpupillary adjustment</b>	48mm-75mm	
<b>Height of eye point</b>	405mm	
<b>Working distance (standard)</b>	110mm	
<b>Weight</b>	6.2 kg (head 1.4kg)	
<b>C-Mount adapter</b>	/	Trinocular head only
	/	0.5X, 0.65X, 1X adapters available
<b>Photo adapter</b>	/	SY10 photo adapter 2.5X, 4X photo eyepiece available
<b>Auxiliary ESD objectives</b>	0.3X [WD = 301mm], 0.5X [WD = 191.8mm], 0.63X [WD = 142.7mm], 0.75X [WD = 128.6mm], 1.5X [WD = 56.3mm], 2.0X [WD = 38.6mm]	
<b>Max. working distance</b>	301mm	
<b>Stand option</b>	Stable pole stand & arm base stand available 3W LED incident & transmitted light with reflector design	

### Light Sources

#### IL-RF, Fluorescent Ring Light

- The bright 7W fluorescent lighting system provides cool white illumination.
- Long life bulb, spare bulb included.
- Ring design eliminates shadows.
- Fits cones between 4.5-6.5cm (1.8"-2.4" dia.)



#### AC-LED, LED Ring Light

- Power Supply: AC 90-265V, 50/60Hz
- Output 24V 6W
- Color Temperature: 6400K
- Lamp Life: Minimum 10,000 hours
- Humidity Range: 0-80%
- Max. Opening: 62mm



### CL-150, Fiber Optical

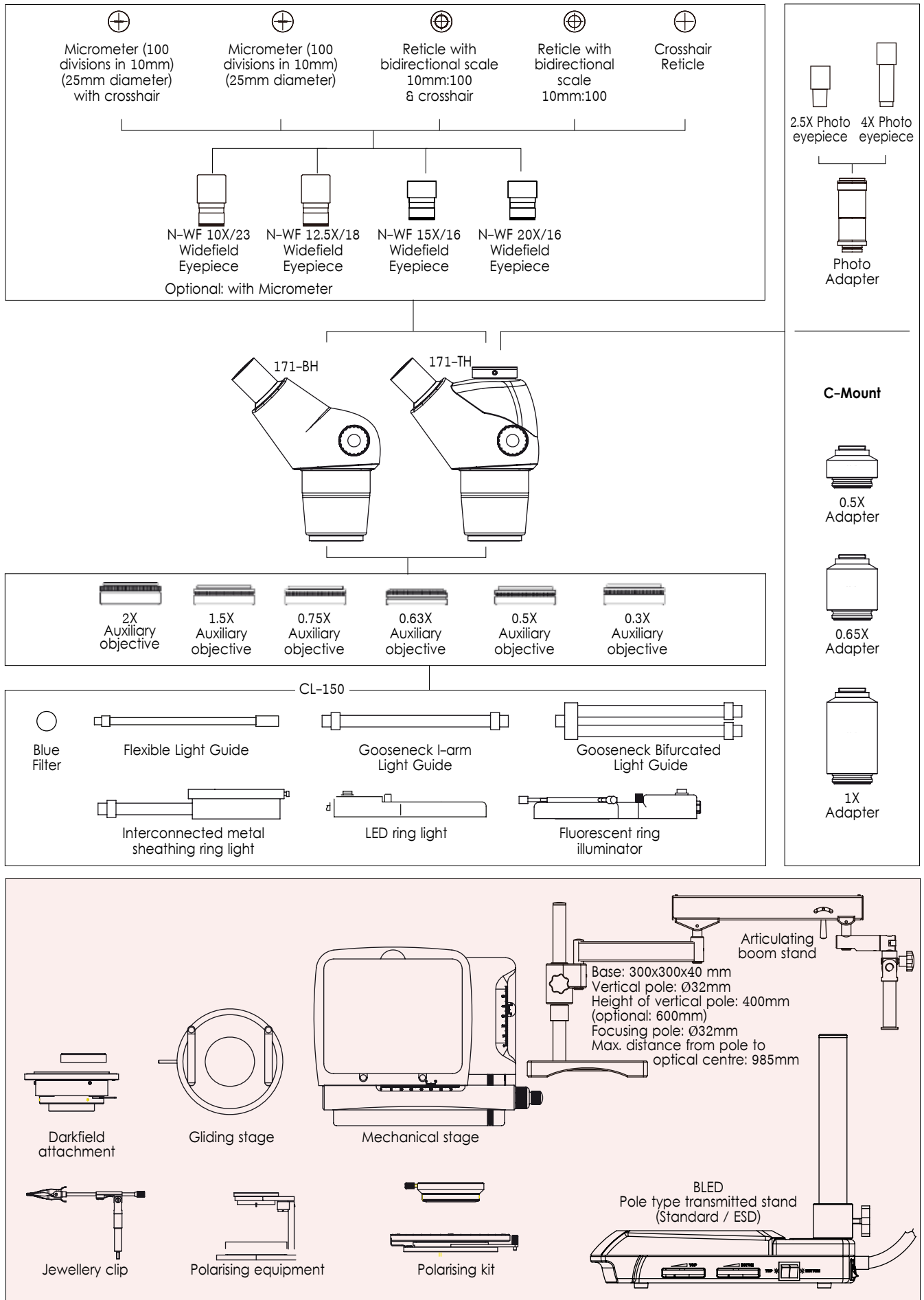
The newest addition to our line of illumination equipment is the CL-150. It features "cold" illumination through filtration and a Series of user defined colored filters. The cold light source has high intensity fiber optic illumination & accessories that allow you to position your light for best possible viewing. The original design shown above features a sturdy small footprint through integrated solid state circuitry. The 150 watt lamp is equipped with a variable control.



- New Design for easy replacing lamp
- Brightness > 23000LU

<b>Power Input</b>	90V-265V	
<b>Dimensions(mm)</b>	210×170×130	
<b>Filter</b>	Filter Red/Blue/Green/Yellow	
<b>Reflector Lamp</b>	21V/150W	
<b>Fiber Adapter</b>	F20	
<b>Option Specification</b>	Twin-Arm Fibre 2-F5X500mm	Ring Fibre F55XF10X1000mm

System Diagram

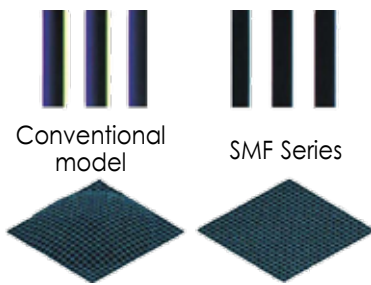


## SMF-806/808/810 Stereo Microscope



### Optional:

- Tilting Binocular Eyepiece Tube, 5-45° Inclination.
- Plan Achromatic Objective 0.5X , Plan Achromatic Objective 2X.
- Eyepiece-16X & 20X.
- Dark Field & Epi-Fluorescent Attachment.
- Coaxial Illumination.
- Photography & Video Attachment.
- Simple Polarization Set.
- Mechanical & Temperature Controlled Stage.
- Universal Stage Stand, D Stand.



Distortion causes a globular effect even when you actually observe a flat object

### Applications: (SMF-806)

There is a wide application in industry field.

Ergonomic design ensures comfortable and accurate operation in a natural posture.

Unrivalled optical performance, ergonomic design and a variety of accessories to meet your requirements.

### Applications: (SMF-808/810)

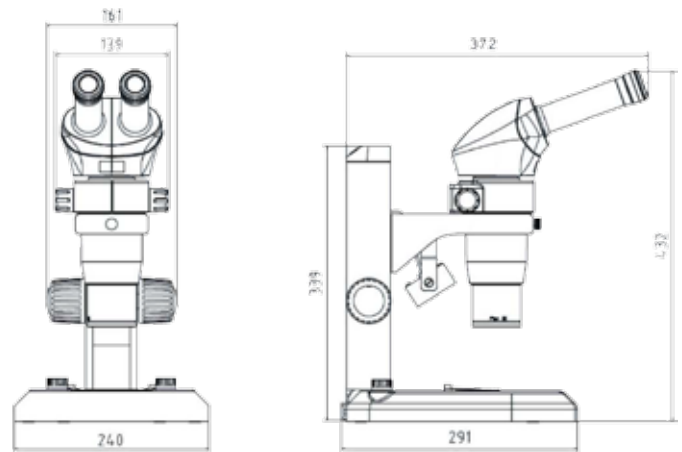
It can be used extensively for scientific research , industry, biological and medical field. Ergonomic design ensures comfortable and accurate operation in a natural posture.

Unrivalled optical performance, ergonomic design and a variety of accessories to meet your requirements

### Images appear undistorted and natural-looking

Producing images that cause less strain on your eyes was one goal of Novel's ergonomic design. We tackled the problems usually associated with stereoscopic microscopes, namely chromatic aberration and distortion in the lens that cause surface irregularities in the image, and solved both to a high degree. Now you can view stereoscopic images that appear undistorted in all their brilliant, true-to-life colors.

Superior optics coupled with simple operation brings you unsurpassed performance.



### Specifications:

Model	SMF-806	SMF-808	SMF-810
<b>Optical System</b>	Parallel Optical Zoom System	Parallel Optical Zoom System	Parallel Optical Zoom System
<b>Drawing Tube</b>	20° Inclined Binocular Head	20° Inclined Binocular Head	20° Inclined Binocular Head
<b>Zoom Ratio</b>	1:6.3	1:8	1:10
<b>Zoom Objective</b>	0.8X ~ 5X	0.8X ~ 6.4X	0.8X ~ 8X
<b>Objective</b>	Plan Achromatic Objective 1X	Plan Achromatic Objective 1X	Plan Achromatic Objective 1X
<b>Eyepiece</b>	10X/Φ22	10X/Φ22	10X/Φ22
<b>Working Distance</b>	78 mm	78 mm	78 mm
<b>Focusing Range</b>	105 mm	105 mm	105 mm
<b>Illumination</b>	Transmission/Reflection LED Illumination, Brightness Adjustable	Transmission/Reflection LED Illumination, Brightness Adjustable	Transmission/Reflection LED Illumination, Brightness Adjustable



Model	description		Ordering Info	SMF-806	SMF-808	SMF-810	
<b>Optical System</b>	Parallel Optical Zoom System		-	☺	☺	☺	
<b>Viewing Head</b>	Binocular head, 20° Inclined		-	☺	☺	☺	
	Tilting binocular eyepiece head. 5-35° Inclined		880-1-00010	◆	◆	◆	
<b>Diopter Adjustment Eyepiece</b>	EW10X/22		-	☺	☺	☺	
	WF15X/16		880-1-00011	◆	◆	◆	
	WF20X/12		880-1-00012	◆	◆	◆	
	WF30X/8		880-1-00013	◆	◆	◆	
<b>Fluorescent Attachment</b>	GFP-B (EX460-500, DM505, BA510-560)		-	☺	☺	☺	
	GFP-L (EX460-500, DM505, BA510)		-	☺	☺	☺	
	CFP-B (EX430-450, DM455, BA465-495) YFP-B (EX490-510, DM525, BA530-560) G (EX515-550, DM570, BA590) RFP-B (EX525-555, DM570, BA585)		880-1-00014 880-1-00015 880-1-00016 880-1-00017	◆	◆	◆	
<b>Objective</b>	Zoom Objective	0.8X-5X	-	☺			
		0.8X-6.4X	-		☺		
		0.8X-8X	-			☺	
	Objective	1X Plan achromatic objective		-	☺	☺	☺
		0.3X Achromatic objective		880-1-00018	◆	◆	◆
		2X Plan achromatic objective		880-1-00019	◆	◆	◆
		0.5X Plan apochromatic objective		880-1-00020	◆	◆	◆
<b>Zoom Ratio</b>	1:6		-	☺			
	1:8		-		☺		
	1:10		-			☺	
<b>Working Distance</b>	78mm		-	☺	☺	☺	
<b>Focusing Range</b>	105mm		-	☺	☺	☺	
<b>Stand</b>	Stand			☺	☺		
	Coaxial coarse & fine focusing stand		-			☺	
<b>Illumination</b>	Transmission & reflection LED Illumination. brightness adjustable		-	☺	☺	☺	
	100W Ultra hi-voltage spherical mercury lamp, power supplier KFP-1, digital display		-	☺	☺	☺	
<b>Photography &amp; video attachment</b>			880-1-00021	◆	◆	◆	

## STM-505 Series, Measuring Microscopes



### Applied fields:

It is an excellent measuring instrument for non-contact inspection and 2D precision measurement, it is applicable to measure the small parts in the metrology department and product line. It can be installed with digimatic measure heads, CCD adapter, CCD camera, digital crossline generator, monitor to be a 2D vision system.

Model	STM-505	STM-505D
Measuring travel	50x50mm	
Working distance	67mm	
Glass stage size	96x96mm	
Maximum work piece height	115mm	
Maximum work piece weight	5kg	
Optical system	Magnification: 30x (15x eyepiece; 2 objective)	
	The eyepiece protractor is graduated in 1°	
	Minimum angel reading: 6'	
	Sighting device: cross-reticel	
Measuring heads&resolution	Mechanic & 0.002mm	Digital (164-162) & 0.001mm
Optional accessories	Rotary table with diameter: φ66mm	
	5x, 10x objective	
	CCD adapter	
	CCD camera	
	Digital cross line generator	
	monitor	
Power supply	AC110V/60Hz; 220V/50Hz	
Dimension	210x333x391mm	
Weight	13.5kg	

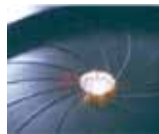
**GEM-250, Stereo Gemological Microscope**

The GEM-250 utilizes the optical performance of MRC's GEM-250 stereo microscope to enhance distinct three-dimensional details with a zoom function. Rugged and precise, the optics of the GEM-250 performs analyses and measurements more accurately & efficiently thus reducing your workload. At a working distance of 113mm, manipulation of the inspected gem or the addition of a further apparatus is permitted without obstruction Available in a trinocular version for photographic or digital capture of the gem, the GEM-250 provides you with an opportunity for extra revenue. Moreover, when teamed with MRC's RCam 480, the GEM-250 becomes your instrument of instruction for teaching and training by showcasing the gem in real time via a television, a projector, and computer simultaneously.



- Magnification range: 0.75x-5x
- Zoom Ratio: 1: 6.7
- Observation angle: 35"
- Working distance: 113mm
- Eyepieces:**
  - Magnification: 10x
  - Field of View range: 30.7mm-4.6mm
  - Mount Diameter: Ø30mm
  - Reticules: Ø25mm

**Illumination: Bright Field Illumination**



Integrating a consistent & powerful SOW Quartz Halogen Bright field illumination with a precise, adjustable aperture diaphragm [Ø41mm - Ø2mm], you are able to measure with a table gauge the proportions and pavilions of a diamond.

**Dark Field Illumination**



Dark field is the ideal illumination for observation of inclusions. With MRC's versatile aperture diaphragm [pictured above], you can control the depth of field and contrast while using the dark field illumination for better identification.

**Incident fluorescent illumination, Diamond Light**



Designed for use with diamonds, the incident light can be adjusted for a thorough examination of the clarity, color, & finishing. The bulb has a color temp. of 6000K to reduce any yellowing effects on the gem.

**Holders, Plates, & Analyzers:**



**1. Wire Stone holder** The ideal holder for diamonds, rubies and sapphires. Comprised of stainless steel for a long working life, the wire stone holder permits the maximum amount of observation.

**2. Rounded Edge Stone holder** Perfect for irregular gems and jewelry. Precision Grafted of stainless steel to provide an adequate grip without corrupting irregular shaped gem samples.

**3. Inclusion pointer** For rapid location of inclusions and fractures on the surface of gem.

**Large gem stags plate**

Magnetically attachable & covering the stage area of the GM168 base to provide a large surface for rough stones and large gems (i. e. fade) inspection in conjunction with the incident fluorescent illumination.



**Diamond Proportion Analyzer Kit**

Complete kit for effective & accurate identification 5 measurement of proportions 4 pavilions. Includes the magnetized diamond mount, diamond proportion reticule, & micrometer eyepiece(10x)



**Immersion cell**

Capable of rapid & easy detection of treated gems characteristics: such as clarity enhancement, HPHT annealing, irradiation, & surface coloration, the immersion cell is especially useful for rubies.



**Accessories:**

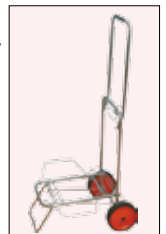
**Case**

When moving the microscope from place to place use our rigid case. Model: SC-70: with lock & key. Dimensions: 295x535x400mm (high)



**Trolley**

Our trolley Model TR-70



**Stand Features & Benefits:**

**Rotary Base**

360° rotary base allows you to showcase the gem to a customer or to confer with a colleague on proper identification.



**Tilting Base**

With a tilting range of 0° [upright] to 45°, the GEM-250's base is accessible to users of various heights.



**Focus Adjustment**

Allowing for a total travel of 125mm for adaptation to different sizes of gems and stones, no sample is too small or too large.



**Stage**

Able to accommodate both a gem holder & inclusion pointer simultaneously in addition to different contrast methods.





**BAM102**

### BAM100 Series, Biological Microscope

Equipped with UCIS universal infinity independent-achromatic optical system, chromatic aberrations and curvature of field are both ideally corrected over the field of view. And the UCIS objectives own higher NA's producing crisp, clear images with minimal flare. Benefit from UCIS infinity optics, BAM100 Series provide a flexible upgrade path to accommodate various accessories to meet your applications for observations of light field, phase contrast, dark field and polarization. And the BAM100 Series optics are perfect for both observations through the eyepiece as well as capturing images with a digital camera or a computer. Agency heat-sink-device of BAM 100 Series keeps the microscopes surface at lower temperature even after long time work.

**Features:** High eye-point eyepiece • Ergonomic and Flexible observation tub • Trinocular Tub • Abbe condenser with color-coded diaphragm scale markings • Revolving nosepiece • Ergonomic co-axial coarse and fine, adjustment knob • Grasping part • Dark condenser • Bright and even illumination.

Parts	Specifications	BAM102	BAM103	Order Number		
BAM 100 Frame	One-piece construction from arm to base	☉	☉	UB100		
Optics	UCIS Infinity Independent Achromatic Optical Design	☉				
Seidentopf Observation Tube	Binocular Tube, Interpupillary distance 52-75mm,30°inclined,360° rotatable Trinocular tube, Interpupillary distance 52-75mm,30°inclined, trinocular light is split 20/80 by a high quality prism	☉	☉	MS3 MT3		
Plan Eyepiece	WF10X/18, High eye-point up to 21mm, diopter adjustable	☉ ☉	☉ ☉	E1018PB		
	WF10X/20, High eye-point up to 21mm, diopter adjustable	◆◆	◆◆	E1020PB		
	WF16X/14	◆◆	◆◆	E1614WA		
	WF10X/18(Pointer), High eye-point up to 21mm,diopter adjustable	◆	◆	E1018GB		
	WF10X/20(Pointer), High eye-point up to 21mm, diopter adjustable	◆	◆	E1020GB		
	Reticule Eyepiece: CROSSWF10X/18 Reticule Eyepiece: CROSSWF10X/20	◆ ◆	◆ ◆	E1018RA E1020RB		
Centering Telescope	CTE	◆	◆	WY2		
Infinity Achromatic Objectives	4X/0.13 ∞/0.17, WD12.31	☉	☉	WB-X4A		
	10X/0.30 ∞/0.17, WD6.75	☉	☉	WB-X10A		
	40X/0.70 ∞/0.17, WD0.76 (Spring)	☉	☉	WB-X40A		
	100X/1.25 ∞/0.17, WD0.12 (Spring,Oil)	☉	☉	WB-X100A		
Infinity Achromatic Phase-Contrast Objectives (positive Or negative)	PH 10X/0.30 ∞/0.17,WD6.75	◆	◆	WB-XPHp10A/WB-XPHn10A		
	PH 40X/0.70 ∞/0.17, WD0.76 (Spring)	◆	◆	WB-XPHp40A/WB-XPHn40A		
	PH 100X/1.25 ∞/0.17, WD0.12 (Spring,Oil)	◆	◆	WB-XPHp100A/WB-XPHn100A		
	Plan 4X/0.13 ∞/0.17, WD12.31 Plan 10X/0.30 ∞/0.17, WD4.00 Plan 20X/0.45 ∞/0.17, WD1.24 Plan 40X/0.70 ∞/0.17, WD0.29 (Spring) Plan 60X/0.80 ∞/0.17, WD0.40 (Spring) Plan 100X/1.25 ∞/0.17,WD0.09 (Spring,Oil)	◆ ◆ ◆ ◆ ◆ ◆	◆ ◆ ◆ ◆ ◆ ◆	WB-P4A WB-P10A WB-P20A WB-P40A WB-P60A WB-P100A		
Infinity Plan Phase-Contrast Objectives	PH Plan 10X/0.30 ∞/0.17, WD4.00 PH Plan 20X/0.45 ∞/0.17, WD1.24 PH Plan 40X/0.70 ∞/0.17, WD0.29 (Spring) PH Plan 60X/0.80 ∞/0.17, WD0.40 (Spring) PH Plan 100X/1.25 ∞/0.17, WD0.09 (Spring,Oil)	◆ ◆ ◆ ◆ ◆	◆ ◆ ◆ ◆ ◆	WB-PPHp10A/WB-PPHn10A WB-PPHp20A/WB-PPHn20A WB-PPHp40A/WB-PPHn40A WB-PPHp60A/WB-PPHn60A WB-PPHp100A/WB-PPHn100A		
	Phase-Contrast Slide	10X PH 40X PH 100X PH	◆ ◆ ◆	◆ ◆ ◆	PCB-XPH10A PCB-XPH40A PCB-XPH100A	
		Condenser	Abbe condenser: NA 1.25, with iris diaphragm Dark Condenser	☉ ◆	☉ ◆	JG3 JG10
			Stage	Mechanical Stage: 142x135mm platform, with X/Y travel of 76X52mm by low-positioned X/Y coaxial control knob, with scale mark and specimen-slide clip, enough space to hold 2 specimen-slide	☉	☉
	Revolving Nosepiece	quadruple, inward facing	☉	☉	ZQ470	
Illumination Kohler	No field diaphragm With field diaphragm	☉ ◆	☉ ◆	KL2 KL3		
	C-Mount	SX2: 0.5X SX3: 1X	◆ ◆	◆ ☉	SX2 SX3	
Filter		Blue Green Yellow Grass Glass	☉ ◆ ◆ ◆	☉ ◆ ◆ ◆	LA2-0011 LU2-0011 LH2-0011 LB2-0011	
	Filter Holder	Filter Holder: (Attached to the Kohler) for more than one filter	◆	◆	LA1-0071	
	Polarization kits	Analyzer Polarizer	◆ ◆	◆ ◆	PQ1 PY1	
		Illumination Bulb	6V20W Osram Halogen Bulb 3W LED Bulb	☉ ◆	☉ ◆	BZ-0022A DQL1-1000
Immerse Oil	8ml		☉	☉	BZ-0027	
Allen Screw Driver	Φ2mm	☉	☉	BZ-0018		
Power Line	1.8mm, CE certified	☉	☉	BZ-0021		
Package	Inner package: foam, plastic bag;Out Package: Paper box	☉	☉	BZ3-0011A		

Symbol Meaning: ☉ means standard ◆ means optional



**BAM200 Series, System Microscope**

BAM200 is our contribution to you for your application in medicine, clinical laboratories, pathology, and biology, from routine task to research. Equipped with advanced USIC infinity optics and ergonomic, flexible, stable, high efficiency mechanism, BAM200 can satisfy your observation of brightfield, darkfield, polarization, phase-contrast, and fluorescence.

**Features:**

- High eye-point up to 21mm
- Abbe condenser
- Dry dark-field condenser
- Simple polarizing observation
- Phase-contrast condenser
- Reflected light fluorescence
- Mechanical stage
- Rackless stage with enhanced operability
- Nward-facing revolving nosepiece
- Observation tub
- Comfortable ergolift
- Grasping part.

Symbol Meaning: ☺ means standard ♦ means optional

Parts	Sepcifications	BAM202	BAM203	Order Number
UB200i Frame	One-piece construction from arm to base	☺	☺	UB200
Optics	UCIS Infinity Independent Achromatic Optical Design			
Seidentopf Observation Tube	Binocular Tube, Interpupillary distance 52-74mm, 30°inclined, 360° rotatable	☺		MS2
	Trinocular tube, Interpupillary distance 52-74mm, 30°inclined, trinocular light is split 20/80 by a high quality prism		☺	MT2
Eyepiece	WF10X/20, Hight eye-point up to 21mm, diopter adjustable	☺ ☺	☺ ☺	E1020PA
	WF10X/22, Hight eye-point up to 21mm, diopter adjustable	♦ ♦	♦ ♦	E1022PC
	WF16X/14	♦ ♦	♦ ♦	E1614WB
	WF10X/20(Pointer), Hight eye-point up to 21mm, diopter adjustable	♦	♦	E1020GA
	WF10X/22(Pointer), Hight eye-point up to 21mm, diopter adjustable	♦	♦	E1022GC
	Reticule Eyepiece: CROSSWF10X/20	♦	♦	E1020RA
	Reticule Eyepiece: CROSSWF10X/22	♦	♦	E1022RC
Centering Telescope	CTE	♦	♦	WY2
Infinity Semi Plan Objectives	4X/0.13 ∞/0.17, WD12.31	☺	☺	WB-X4A
	10X/0.30 ∞/0.17, WD6.75	☺	☺	WB-X10A
	40X/0.70 ∞/0.17, WD0.76 (Spring)	☺	☺	WB-X40A
	100X/1.25 ∞/0.17, WD0.12 (Spring,Oil)	☺	☺	WB-X100A
Infinity Semi Plan Phase-Contrast Objectives (positive or negative)	PH 10X/0.30 ∞/0.17, WD6.75	♦	♦	WB-EPHp10A /WB-EPHn10A
	PH 40X/0.70 ∞/0.17, WD0.76 (Spring)	♦	♦	WB-EPHp40A /WB-EPHn40A
	PH 100X/1.25 ∞/0.17, WD0.12 (Spring,Oil)	♦	♦	WB-EPHp100A/WB-EPHn100A
Infinity Plan Objectives	Plan 4X/0.13 ∞/0.17, WD12.31	♦	♦	WB-P4A
	Plan 10X/0.30 ∞/0.17, WD4.00	♦	♦	WB-P10A
	Plan 20X/0.45 ∞/0.17, WD1.24	♦	♦	WB-P20A
	Plan 40X/0.70 ∞/0.17, WD0.29 (Spring)	♦	♦	WB-P40A
	Plan 60X/0.80 ∞/0.17, WD0.40 (Spring)	♦	♦	WB-P60A
	Plan 100X/1.25 ∞/0.17, WD0.09 (Spring,Oil)	♦	♦	WB-P100A
Infinity Plan Phase-Contrast Objectives	PH Plan 10X/0.30 ∞/0.17, WD4.00	♦	♦	WB-PPHp10A / WB-PPHn10A
	PH Plan 20X/0.45 ∞/0.17, WD1.24	♦	♦	WB-PPHp20A / WB-PPHn20A
	PH Plan 40X/0.70 ∞/0.17, WD0.29 (Spring)	♦	♦	WB-PPHp40A/WB-PPHn40A
	PH Plan 60X/0.80 ∞/0.17, WD0.40 (Spring)	♦	♦	WB-PPHp60A / WB-PPHn60A
	PH Plan 100X/1.25 ∞/0.17, WD0.09 (Spring,Oil)	♦	♦	WB-PPHp100A/WB-PPHn100A
Phase-Contrast Slide	10X PH	♦	♦	PCB-XP10A
	40X PH	♦	♦	PCB-XP40A
	100X PH	♦	♦	PCB-XP100A
Condenser	Multi-purpose phase-contrast Condenser: NA:1.25, Phase-contrast observation from 10X to 100X and Dark- field observation from 10X to 40X is allowed	♦	♦	JG20
	Abbe condenser: NA 1.25, with iris diaphragm	☺	☺	JG2
	Dark Condenser	♦	♦	JG10
Stage	Mechanical Stage: 156x138mm platform, with X/Y travel of 76X54mm	☺	☺	ZT2
Revolving Nosepiece	quadruple, inward facing	☺	☺	ZQ480
Illumination Kohler	With field diaphragm	☺	☺	KL3
C-Mount	SX2: 0.5X		☺	SX2
Filter	Blue	☺	☺	LA1-0011
	Green	♦	♦	LU1-0011
	Yellow	♦	♦	LH1-0011
	Grass Glass	♦	♦	LB1-0011
Filter Holder	Filter Holder: (Attached to the Kohler) for more than one filter	♦	♦	LA1-0071
Polarization kits	Analyzer	♦	♦	PQ1
	Polarizer	♦	♦	PY1
Illumination Bulb	6V20W Osram Halogen Bulb	☺	☺	BZ-0022A
	6V30W Osram Halogen Bulb	♦	♦	BZ-0022B
	3W LED Bulb	♦	♦	DQL1-1000
Immerse Oil	8ml	☺	☺	BZ-0027
Allen Screw Driver	Φ2mm	☺	☺	BZ-0018
Power Line	1.8m, CE certified	☺	☺	BZ-0021
Package	Inner package: foam, plastic bag;Out Package: Paper box	☺	☺	BZ3-0011A



**B1-220ASC**

### B1-220ASC, Biological Microscope

The MRC B1 Biological Microscopes with its standard features are designed for school applications. This system is for use in laboratories/ clinics, research facilities and medical schools. The modern and ergonomic design distinguish itself from the others. Its affordable price and excellent quality give you the best value for your money.

#### Head

There are five kinds of head for your choice, which are 360° rotating around its vertical axis. Two binocular heads are available, with standard 45° inclined and optional 30° inclined, providing adequate choices for your best viewing comfort. Also, diopter rings on both tubes are a standard feature to facilitate compensation for eye acuity. Graduated interpupillary distance adjustment is from 54mm to 76mm. Also, there are monocular, dual teaching and trinocular head available for selection.

#### Mechanical Stage

Built-in ball bearings mechanical stage provides a travel range of 76mm X 50mm in the X and Y direction respectively with graduations reading up to 0.1 mm for accurate positioning of specimen.

#### Coaxial Coarse and Fine Focusing Knobs

The precision Focusing mechanism is designed for frequent use and also provides a smooth adjustment of focus. The coarse focus is with adjustable tension device.

#### Condenser

The extremely efficient, removable N.A. 1.25 abbe condenser for brighter illumination level, and an iris diaphragm for resolution and contrast control.

#### Illuminator

A standard halogen lamp 1 2V/20W with the intensity control system is used, providing an even and bright illumination for all magnifications. Kohler illumination can be ordered as option which is centerable for advanced and special applications.



#### Objectives:

A full range of achromatic (A-10X, A-40XR and A-100XR oil) & plan achromatic super contrast (Plan ASC4X, Plan ASC10X, Plan ASC40XR, and Plan ASC100XR oil) objectives in the B1 provide you with superior optical quality. A new device for anti-fungus is available, this effect can last for more than three years.

	Magnification	Model	N.A.
High performance Achromatic	PL4X	<b>SG01.S01211</b>	0.1
	A10X	<b>SG01.S02211</b>	0.25
	A20X	<b>SG01.S03211</b>	0.45
	A40X	<b>SG01.S04211</b>	0.65
	A60X	<b>SG01.S05211</b>	0.85
	A100X	<b>SG01.S06211</b>	1.25
Ultra high performance Plan Achromatic Super Contrast	Plan ASC4X	<b>SG01.S01217</b>	0.1
	Plan ASC10X	<b>SG01.S02217</b>	0.25
	Plan ASC40X	<b>SG01.S04217</b>	0.65
	Plan ASC100X	<b>SG01.S06217</b>	1.25

### Accessories For Microscope Applications

#### Phase Contrast

Phase contrast provides clear contrast of specimen without dying and therefore useful for observing alive or transparent specimens.



By simply rotating the turret, the condenser can be set for brightfield and phase contrast microscopy. It can be used with 10x, 20x, 40x and 100x phase objectives. Simple plug in phase ring is also available for 10X, 20X and 40X phase objectives.



#### Polarizing

Polarizing – special polarizing equipment available with polarizer, analyzer and an optional pol specimen stage enable pol microscopy as Geology, Mineralogy etc.



#### Darkfield

Darkfield central stopenables darkfield observation at 4x through 40x when the attachment is mounted on the brightfield condenser bottom section.

#### Kohler Illumination

Kohler Illumination which is centerable and can be ordered as option.





**DMBA210, Basic Digital Biological Microscope**

The DMBA210 Digital is designed for both educational and teaching environments delivering a new higher level of optical performance.

**Description:**

The new DMBA210 Series is setting a new standard in microscope performance through improvements both in optical and mechanical features. Designed to be used in Educational Life Science, Medical as well as a variety of biological applications, this new microscope is built around Mrc's complete understanding of the daily demands placed on the standard educational microscope. Student proof features together with a new generation of EF-N Plan Achromatic objectives provide a fully corrected intermediate image for crisp and clear visual and digital results. The DMBA210 is a robust student instrument that brings professional, repeatable image quality results to all of its intended applications. The DMBA210 Digital is a Digital version of the DMBA210 that features a built-in imaging head with 3.0MP streaming live output through USB2.0 connections.

Model	DMBA210		
<b>Observation Tubes</b>	Ergonomic 30 degree viewing angle		
	55-75mm interpupillary distance		
	Large field of view with 18mm or 20mm options		
	Built-in Digital with 20/80 split and 3.0MP imaging sensor delivering high-resolution streaming images through a USB2.0 connection		
<b>Eyepieces</b>	N-WF 10x/18mm		
	N-WF 10x/20mm		
	N-WF 15x/13.3mm		
	N-WF 12.5x/16mm		
	<b>Magnification</b>	<b>N.A.</b>	<b>W.D (mm)</b>
	EF-N Plan 4x	0.1	6.3
	EF-N Plan 10x	0.25	4.4
	EF-N Plan 20x	0.4	4.66
	EF-N Plan 40x	0.65	0.35
	EF-N Plan 60x	0.85	0.13
	EF-N Plan 100x	1.25	0.13
	EF-N Plan Phase 10x	0.25	4.4
EF-N Plan Phase 40x	0.65	0.35	
<b>Illumination Options</b>	6V/30W Halogen		
	3W LED		
	Mirror		
<b>Condenser</b>	Abbe 1.25NA with slot for accessories and condenser lock available		
<b>Stage</b>	Hard Coated Mechanical Stage with 76x30mm travel range		
	Left or Right Stage drive available		
<b>Other Options</b>	Simple Phase Contrast 10x and 40x sliders for condenser		
	Darkfield slider for condenser		
	Simple Polarization with analyzer and polarizer		

**Features:**

Requires a USB2.0 connection • Windows XP,win7, or OSX • Intel Centrino Recommended • Mrc Images Plus 2.0 software for PC and Mac (OSX).



AE31

### AE30/AE31, Inverted Microscope

MRC combines CCIS optics with innovative mechanical design, unrivalled versatility, ergonomics and optical excellence and brings you a new Series of inverted microscopes.

#### Color Corrected Infinity Optical System

The eels optics allows new accessories and functions to be incorporated into the AE30/31 inverted microscope.

The CCIS infinity design has succeeded in achieving longer working distance objectives with higher numerical apertures. This represents a significant development in optical performance and versatility.

#### The Microscope Stand

The design of the AE30/31 inverted microscopes optimally integrates all functions enabling effective ergonomics and maximum expand ability.

#### Condenser Mount

The centerable condenser mount is height adjustable with rack and pinion and is dovetail mounted on an illuminating pillar with a clamp screw.

#### Standard & Optional Set Configuration

#### The Light Source

The Kohler illumination system with a 6V-30W Quartz halogen lamp provides bright, even illumination at any magnification. The "only one in its class" centerable lamp is housed externally and has an externally operated mechanism for control of all facets of illumination. A segmented illumination intensity indicator is ideally located for easy viewing.

#### Specifications:

	AE30	AE31
Optical system	CCIS (Color corrected infinity optical system). Parfocal distance: 45mm	
Observation Tubes	Siedentopf type binocular tube	Siedentopf type trinocular tube (light distribution, bino/photo: 100/0 or 0/100)
	Inclination	
	45 degrees	45 degrees
	Interpupillary distance	
	50-75mm	50-75mm
Eyepieces	Widefield High Eyepoint WF PL 10X (FN 22) with diopter adjustment	
	Quintuple nosepiece, side facing type	
Plain stage	Stage size: 200 x 260mm. Stage height: 207mm from table.	
Focusing	Coaxial/via nosepiece up / down movement Coarse/fine movement - 42mm/0.2mm Min. fine reading Zprn. Adjustable coarse torque	
Illumination	6V-30W Quartz halogen centerable lamp is housed externally and has an externally operated device for all the elements of illumination with built-in heat absorbing filter & removable diffuser	
Condenser	ELWO N.A. 0.30 (W.O. 72mm) Focusable LWO N.A. 0.50 (W.O. 28mm) Focusable for objectives 4X to 40X	
Collector	A spherical lens with field diaphragm	

Specifications			Order No.	AE30	AE31
Eyepieces	Widefield High Eyepoint	WF PL 10X/22 with diopter adjustment	SG02S0144	☉	☉
CCIS Infinity Objectives	LWD Phase	CCIS PL Ph10X	SG01S02291	☉	☉
		CCIS LWD PL Ph20X	SG01S03291	☉	☉
		CCIS LWD PL Ph40X	SG01S04291	◆	◆
	LWD Plan	CCIS PL4X	SG01S01241	☉	☉
		CCIS PL10X	SG01S02241	◆	◆
		CCIS LWD PL20X	SG01S03241	◆	◆
		CCIS LWD PL40X	SG01S04241	◆	◆
		CCIS LWD PL60X	SG01S05241	☉	☉
Condenser	ELWD N.A. 0.30 (W.D. 72mm)		SG030401A	☉	☉
	LWD N.A. 0.5 (W.D. 28mm)		SG030701	◆	◆
Phase Slider	Centerable: Ph1, Ph3, One empty position		SW0123F8	☉*	☉*
	Non-centerable Ph1, Brightfield, Ph3 (to be released)				
Phase Contrast Accessories	Phase Centering Telescope (030)		SG069993	☉*	☉*
Photo Adapters	Photo Adapter (requires one of the photo eyepieces below)		SP100294	-	◆
	2.5X Photo eyepiece		SG02S1001	-	◆
	4X Photo eyepiece		SG02S1101	-	◆
Video Adapters	CCD adapter 0.65X		SP100384	-	◆
	CCD adapter 1X		SP100350	-	◆
Stage & Accessories	Glass stage insert		SP100301	☉	☉
	Metal stage insert		SW0199F9	☉	☉
	Auxiliary stages (paired set)		SW0123G3	◆	◆
	Universal attachable mechanical stage with well plate holders		SW010392	◆	◆
	35mm Petri dish holder		SP100303	◆	◆
	54mm Petri dish holder		SP100304	◆	◆
Filters	65mm Petri dish holder		SP100302	◆	◆
	Green interference (45mm diameter)		SG060747	☉	☉
	Blue filter (45mm diameter)		SG060727	☉	☉
	Ground glass (45mm diameter)		SG060729A	☉	☉
Allen Hex. Key	Two keys provided		SP070014	☉*	☉*
<b>Notes:</b> ☉ represents the standard accessories. ◆ represents the optional accessories. * to be used with phase objectives.					

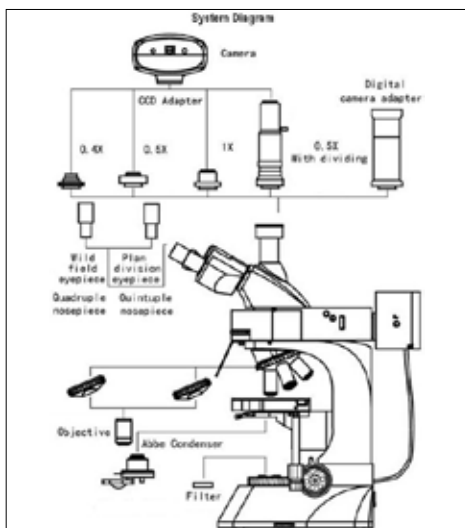




**L3201LED**

**Features:**

- Adopt infinity optical system and modular function design.
- Equipped with infinity plan achromatic fluorescent objectives, enable obtain more clearer and brighter image.
- Wide-field plan eyepieces: field number  $\Phi 22\text{mm}$ .
- Coaxial coarse/fine focus system, with tension adjustable and limit stopper, minimum division of fine focusing:  $2\mu\text{m}$
- Transmitted illumination: 3W high brightness white LED, brightness adjustable.
- Epi-illumination: 3W high brightness monochromatic LED, enable changing for different wave length LED, but the brightness can't be adjustable.
- Trinocular can be observation for eyepieces and micro photography in 100% light flux, suits for low illuminance micro photography.
- Wide voltage range power supply (85-265V 50/60Hz).



**L3201LED EPI-Fluorescent Microscope**

L3201LED Epi-fluorescent microscope is used for fluorescence microscopy and transmitted field observation. It is equipped with no magnification sphero chromatic aberration infinity plan achromatic fluorescent objectives & wide field eyepieces, has clear picture & wide view field. The transmitted and epi-fluorescent illumination light source are high power & brightness LED, but power consumption is lower and use life longer, very good radiating heat effect. Safely and comfortably using the instrument, the cost of use and maintenance are more lower. It is the ideal instrument in biology, cytology, oncology, genetics, immunology etc. It also can be used in scientific research, universities, medical treatment, epidemic prevention etc.

**Standard Configuration:**

Model	L3201LED
Objectives	Infinity plan achromatic objectives
	PL 4X/0.10 (Work distance) : 19.8mm
	PL 10X/0.25 (Work distance) : 5.0 mm
	PL FL20X/0.65 (spring) Work distance : 0.70 mm
	PLF L40X/0.85 (spring) Work distance : 0.42 mm
	PL 100X/1.25 (Spring, oil) Work distance : 0.36mm
Eyepieces tube	Trinocular (Inclination of 30°)
Epi-fluorescent illumination system	3W high brightness LED. Enable selecting monochromatic or bichromatic LED for light source, every monochromatic LED wave band: Green (520nm - 530nm) Blue( 460nm - 470nm)
	Fluorescence filters: B(Blue) and G(Green)
Focus system	Coaxial coarse/fine focus system, with tension adjustable and limit stopper, minimum division of fine focusing: $2\mu\text{m}$
Nosepiece	Quadruple(Backward ball bearing inner locating)
Stage	Double layer mechanical (Size: 210mmX140mm, movingrange: 75mmX50mm)
	Abbe condenser NA.1.25 Rack & pinion adjustable
Transmitted illumination system	Blue filter and Ground glass
	Collector for LED illumination and integrated field diaphragm
	3W high brightness white LED, brightness adjustable

**Optional accessories:**

Name	Sort/Technique parameter	NO.
Eyepiece	Dividing eyepiece(field number:22mm) 0.10mm/Div	1122010
	Infinity plan achromatic objective	
Objective	PL 60X/0.80 Work distance : 0.46 mm	2060160
Nosepiece	Quintuple (Backward ball bearing inner locating)	032002
Filter	Green filter	115002
	Yellow filter	115003
LED	390nm~400nm Violet (390nm~400nm)	-
	360nm~370nm Ultraviolet (360nm~370nm)	-
Fluorescent filters	V(Violet)	-
	UV (Ultraviolet)	-
CCD adapter	0.4X	810001
	0.5X	810004
	1X	810002
	0.5X with dividing 0.1mm/Div	810003
Camera	2DV-1 (With USB & video output)	800001
	DV-2 (With USB output)	800003
	DV-3 (With video output)	800005
Digital cam adapter	CANON(EF) NIKON( F)	820001



### MIP101, Metallurgical Microscope

MIP101, the reflected light microscope is suitable to observe the microscopical surfaces of non-transparent object. It is equipped with large move range stage, vertical illumination, plan achromatic objectives and wide-field eyepieces. It provides clear and high-contrast picture, and with polarizer device. It is the ideal instrument in research work in metallography, mineralogy, precision engineering, electronics etc. It's suitable for scientific research, teaching demonstration in the colleges and factory.

Module & Spec.				
Eyepieces	Wide field	WF10X(Ø18mm)	☺	
		WF16X(Ø11mm)	◆	
	Plan dividing	10X (0.10mm/div)	◆	
Objectives	Plan achromatic (No cover glass)	Magnification/N.A	Work distance	
		PL5X/0.12	18.3	☺
		PL10X/0.25	8.9	☺
		PL25X/0.40	8.7	☺
		PL40X/0.60	3.7	☺
		PL50X/0.70	2.02	◆
	PL80X0.80	0.96	☺	
Eyepieces tube	Trinocular	Compensation (inclination of 30°) Including analyzer		
Stage	Size: 250x250mm can be move quickly. Move Range: 153x153mm		☺	
	Size: 274x274mm can be move quickly. Move Range: 203x203mm			
Nosepiece	Backward inner locating on ball bearing	Quintuple	☺	
CCD Camera Accessories	0.4X CCD Camera adapter		◆	
	CCD Camera adapter		◆	
	0.5X CCD Camera adapter with dividing		◆	
	CCD Camera		◆	
Illumination unit	Vertical illuminator 6V 20W halogen lamp, adjustable brightness, with polarizer		☺	
Digital Camera Adapter	CCD camera and accessories		◆	

Imaging Device	2.0 Mega pixels 1/2"
Effective Pixels	1600 x 1200
Max. Still Image Resolution	2.0 Mega pixels
Scanning System	Progressive Scan
Max. Frame Rate	10fps@Max. Res, 40 fps@Binning
Max. Data Transfer	480MB/Sec through USB2.0
Min. Illumination	3 Lux
Camera Power Supply	5V self-power through USB connection
Min. System Requirements	P3; 1GHz, 256MB RAM, 32MB Display, Win XP/2000, USB2.0 G4; 1GHz, 256MB RAM, OSX, USB2.0
Included Software	MRC Images Plus 2.0 for Windows & Macintosh (2 CD)
Calibration Slide	MRC Certified printed calibration slide

### Live High Resolution Digital Camera

Moticam is compact and lightweight camera that attach to virtually any microscope through the eyepiece, eyetube or onto a trinocular mount • Easy plug & play USB2.0 Hi-Speed connection ensures that crisp and clear real-time images are displayed on the computer monitor turning any microscope into a Digital Microscope • Use this camera with your own software through a TWAIN interface or use the included MRC Images Plus 2.0 application software on both Windows and Macintosh systems

• The complete set of included accessories gives these hi-resolution cameras the ability to be used in many different applications from Macro to Micro viewing.



MOTICAM 2000



**MIP6A, Metallurgical Microscope**

MIP6A is the ideal tools for testing metal material, verifying the quality of casting and analyzing metallographic organization of the material metallized. It can be widely used in such as factories, schools and science research institutions for identifying and analyzing the microstructure of all kinds of metal and alloys. Note: in this table, "n" denotes a standard attachment, "m" denotes an optional accessory. Design change: To keep pace with technological advances, we have reserved the right to make design modifications& changes without notice.

Design Change: To keep pace with technological advances, we have reserved the right to make design modifications and changes without notice • Package dimension: 665mm x475mm x310mm • Net weight: 14kg • Gross weight: 19kg • ISO9001 Certification.

**Standard Outfits:**

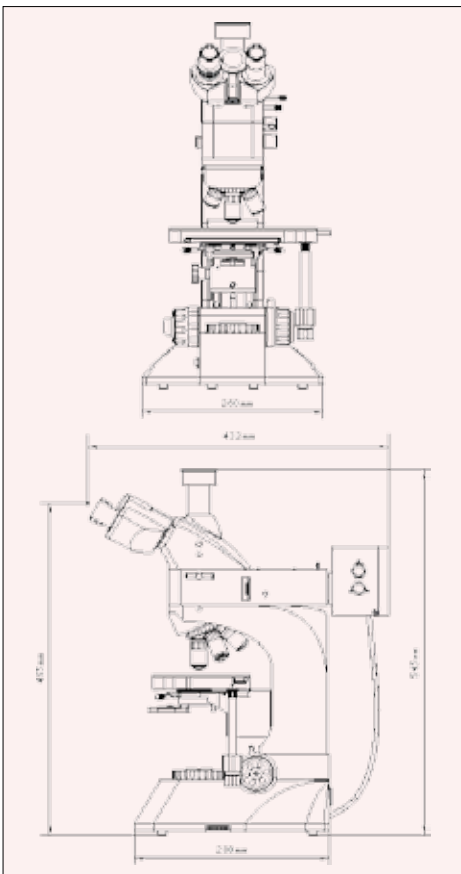
Model	Item	Standard Outfits
	Main body	☉
S09	Mechanical stage with a stroke of 75 by 50 & size of 180 by 55	☉
EP10	Plan eyepiece 10 X -18	☉ ☉
EP12.5	Plan eyepiece 12. X -14	☉ ☉
EH5	Huygenian ocular 5 X -20	◆◆
EW10	Plan eyepiece 10 X -20	◆◆
Epr10b	Plan eyepiece 10 X -14	☉
B-OAr4	Achromatic objective 4/0.10	
M-OAr10	Achromatic objective 10/0.25	
M-OSPr40	S-plan achromatic objective 40/0.65	
M-OAor100	Achromatic objective 100/1.25 oil	
B-OPr2.5	Plan achromatic objective 2.5/0.07	◆
B-OPr4	Plan achromatic objective 4/0.10	◆
B-OPr10	Plan achromatic objective 10/0.25	☉
B-OPr20	Plan achromatic objective 20/0.35	☉
B-OPr40a	Plan achromatic objective 40/0.65	☉
M-OSPor100	S-plan achromatic objective 100/1.25 oil	☉
9J-6	Stage plate (1)	☉
9J-7	Stage plate (2)	☉
9J-8	Stage plate (3)	☉
9J-9	Stage plate (4)	◆
9J-11	Stage plate holder	☉
TBR03	Rotating binocular head ( 45 degree )	☉
LH01	Lamp housing	☉
	Halogen lamp 6V30W	☉ ☉
PO02	Polarizer	☉
PA01	Analyzer	☉
CL02	Specimen clamps	☉
9J.7	Photo adaptor	◆
EPHp5	Photo eyepiece S5X	◆
EPHp6.3	Photo eyepiece S6.3X	◆
EPHp0.65	Video eyepiece 0.65X	◆
	Metallurgical Microphotography equipment	◆
	35mm DF camera with shutter release	◆
SC03	Specimen holder	◆
	Stage micrometer ( division 0.01mm )	◆



L3230

**Features:**

- With infinity plan achromatic objectives with long working distance (no cover glass) and wide-field eyepieces, can get clear pictures and wide view field.
- Coaxial coarse/fine focus system, with tensional adjustable and up stop, minimum division affine focusing: 2~1m.
- Movement of stage: 30mm
- With vertical illuminator and transmitted illuminator, can observe surfaces of non-transparent object or transparent object.
- Trinocular, can switch to observe normally or to observe the Polarize, can send 100% or light to the binocular eyepieces or to the top port.



**L3230, Reflected Light & Transmitted Light Microscope**

L3230 reflected and transmitted microscope is suitable to observe surfaces of non-transparent object or transparent object. It is equipped with vertical illuminator, infinity plan achromatic objectives with long working distance (no cover glass), wide-field eyepieces and set polarizer device in trinocular. It provides clear and high-contrast image, beautiful sculpt, convenient control, etc. It is the ideal instruments in research work in biology, metallography, mineralogy, precision engineering, electronics, etc. It is suitable for scientific research, teaching demonstration in the colleges and factory.

Model	L3230
Eyepiece & Objectives	Wide field WF10X (Φ20mm)
	PL L5X/0.12 Infinity plan achromatic objectives with long working distance (no cover glass)
	PL L10X/0.25 Infinity plan achromatic objectives with long working distance (no cover glass)
	PL L40X/0.60 (spring) Infinity plan achromatic objectives with long working distance (no cover glass)
	PL L60X/0.75 (spring) Infinity plan achromatic objectives with long working distance (no cover glass)
Eyepieces tube	Trinocular, Inclination of 30°, (Analyzer with field diaphragm to switch)
Vertical illumination unit	6V 30W, halogen lamp, adjustable brightness
	Vertical illumination with field diaphragm, aperture diaphragm and polarizer,(Y,B,G)filter and Ground glass
Focus system	Coaxial coarse/fine focus system, with tension adjustable and limit stopper, minimum division of fine focusing: 2μm.
Nosepiece	Quadruple (Backward ball bearing inner locating)
Stage	Double layer mechanical (Size:210mmX140mm,movingrange: 75mmX50mm)
Vertical illumination unit	Abbe condenser NA.1.25 Rack & pinion adjustable
	Blue filter and Ground glass
	Collector for illumination with halogen lamp (With field diaphragm)
	6V 20W, halogen lamp, adjustable brightness

Name	Sort/Technique parameter	NO.
Eyepiece	Wide field eyepiece WF10X(Φ18mm)	1041010
	Wide field eyepiece WF16X(Φ11mm)	1051016
	Dividing eyepiece 10X(Φ18mm) 0.10mm/Div	1121010
Objective	PL L 20X/0.40 Infinity plan achromatic objectives with long working distance (no cover glass)	2830120
Nosepiece	Quintuple Backward ball bearing inner locating	032002
Filter	Green filter	115002
	Yellow filter	115003
CCD adapter	0.4X	810001
	0.5X	810004
	1X	810002
	0.5X with dividing 0.1mm/Div	810003
Photo unit	2.5X/4X Change over photograph attachment with 10X viewing eyepiece	840001
	4X Focusing photograph attachment	840002



<b>Moticam 1</b>	Live Resolution: 800x600 pixels
	Optical Calculation 1/4"
<b>Moticam 1SP</b>	Live Resolution: 1.3 Mega pixels
	Optical Calculation 1/3"
<b>Moticam 2</b>	Live Resolution: 2.0 Mega pixels
	Optical Calculation 1/3"
<b>Moticam 3</b>	Live Resolution: 3.0 Mega pixels
	Optical Calculation 1/2"
<b>Moticam 5</b>	Live Resolution: 5.0 Mega pixels
	Optical Calculation 1/2.5"
<b>Moticam 10</b>	Sensor Resolution: 10 Mega pixels
	Optical Calculation 1/2.3"
<b>Moticam-X</b>	Sensor Resolution: 2.0 Mega pixels
	Wifi Resolution: 1.3 Mega pixels
	Optical Calculation 1/3"

**MOTICAM-PRO** feature a 4 frame buffer as well as on-board image processing with the built-in Schott BG 40 bandpass filter further ensuring high-quality imaging. The Moticam Pro also features an external hardware trigger port (TTL) which can be used to trigger the camera or have the camera trigger an external device.

Model	252A	205A	205C	285A	285C
<b>Color/Monochrome</b>	Color	Color	Monochrome	Color	Monochrome
<b>Resolution</b>	2080x1542	1360x1024	1360x1024	1360x1024	1360x1024
<b>Max. Frame Rate of full Resolution</b>	4.28fps	7.5fps	7.5fps	15fps	15fps
<b>Image Sensor</b>	ICX2520AQ	ICX2050AK	ICX205AL	ICX285AQ	ICX285AL
<b>Sensor Size</b>	1/1.8	1/2	1/2	2/3	2/3
<b>Pixel Size</b>	3.45µ x 3.45µ	4.65µ x 4.65µ	4.65µ x 4.65µ	6.45µ x 6.45µ	6.45µ x 6.45µ
<b>ADC Converter</b>	12 bit				
<b>Image Memory</b>	4 frame buffer				
<b>Shuffer Settings</b>	125ms-60sec				

<b>Moticam 580</b>	Sensor Resolution: 5.0 Mega pixels
	Optical Calculation 1/2.5"





AMP3000

**Features:**

- Ergonomic hanging Counterbalanced pantographic arm design allows you to sit straight, which helps to eliminate back and neck pain.
- Optical head can be folded down to the arm at a highest position. In that way you will have a clear and free working area when you don't use microscope.
- Objective lens 200mm & 250mm with fine focusing adjustment knob.
- Two 150W Halogen bulbs with through the lens coaxial lighting and "change on the fly" lamp selector.  
\*\*Should a lamp fail during an examination, this feature allows a quick change from one lamp to another resulting in an uninterrupted procedure.
- Infinity corrected optical system / coaxial illumination.  
Fiber optic illumination system with brightness adjustment knob. The knob is just over the optical head. It is very convenient to adjust the brightness.
- Built-in orange filter and green filter. You can select the filters by a knob located at the same place of the fiber optic cable which is connected to the back of optical head.
- Easily maneuverable optical head with tension control knobs and 2 handles (One front handle is optional). The optical head can be stopped at any position in the moving range.
- A special switch is fitted into the arm. The lamp will keep "on" when the optical head moves in normal working range and the lamp will turn off automatically while the optical head moves out of normal working range.
- An integrated 1/3" CCD video camera is available for some models.

**AMP3000, Surgical Microscope**

**MRC AMP3000 Series Surgical Microscopes offer outstanding optical performance with brilliant apochromatic optics and excellent ergonomics. It brings high performance, reliability. The ergonomic design of the microscope gives precise, fatigue-free operation, with brilliant three-dimensional images at a large depth of focus. It is suitable to be used as Dental and ENT surgical microscope especially.**

**Specifications:**

- Either 45° inclined or 0° -180° indinable binocular head for Dental surgery or Straight binocular head for ENT surgery.
- 12.5x118mm High Eye-point Wide-Field eyepieces.
- Range of Pupillary distance: 50mm to 70mm.
- Diopter of Eyepiece: +/- 70.
- 250mm apochromatic objective lens.
- Magnification: 5-step, Total magnification indicator 0.4=3.44x, 0.6=5.36x, 1 =8.48x, 1.6=13.6x, 2.5=21.2X.
- Diameter of object field: 8.3mm to 51.9mm.
- Arms: First big arm, 500mm in length can be rotated 360°.  
Second small arm, 600mm in length with movement +/- 300mm, can be rotated +/-150°. Third angled arm can be 3-D movement.
- Height: 1750mm.
- Base size: 610mm X 600mm.
- Two 15V/150W Halogen Lamps are manually changeable by a level.
- Maximum Object Illumination: 30,000 Lx.
- Built-in Orange filter and Green filter changed by a knob.
- Power supply: 220V/50Hz or 110V/60Hz.

**Optional Accessories:**

- AM-E10x: 10x eyepiece
- AM-E16x: 16x eyepiece
- AM-Lens: Objective Lens 200mm, 300mm, 350mm, 400mm
- AM-BS : Beam Splitter
- AM-CA : Video (CCO Camera) Adapter
- AM-DA : Digital Camera Adapter
- Microscope Rotation Ring System
- Wall Mount System
- Ceiling Mount System
- Fixed Mount System
- CCD Video Cameras & Monitors.



**AMP6000, Surgical Microscope**

MRC is proud to offer AMP6000 Series surgical microscopes. It is a light weight and portable surgical microscope suitable for almost all working situation, especially in a small space. The lenses inside the microscope are made of Schott™ Optical Glass imported from Germany, which offers excellent optic feature, such as high resolution, long depth of field, etc. It brings high performance, reliability. The ergonomic design of the microscope gives precise, fatigue-free operation, with brilliant three-dimensional images at a large depth of focus. It is suitable to be used as Dental and ENT surgical microscope especially.

**MOTICAM Cameras**

- MRC Images Plus for PC and Mac
- Others: Direct Show, TWAIN and Media Cybernetics Image Pro Plus 7 Driver compatibility.

**Features:**

- 12.5x High Eye-point Wide-Field eyepieces with diopter locks & fold down eyecups. Diopter of Eyepiece: +/- 6D.
- 250mm objective lens with objective protector.
- The range of pupillary distance: 50mm to 75mm.
- 3-Step Magnifications (5x, 8x, 12. 7x), 5-Step Magnifications (3.2x, 5x, 8x, 12.7x, 20x) or Magnification (3.2x-20x) with standard 12.5x eye piece & 250mm objective lens.
- Observation field from 42mm to 16mm for 3-Step, from 65mm to 1 Omm for 5-Step & from 65mm to 10mm for Continuous Zoom.
- Optional magnification are available by combining eyepiece 10x, 16x or 20x & objective Lens 100mm, 175mm, 200mm, 300mm, 350mm or 400mm.
- Infinity corrected optical system/ coaxial illumination.
- Fiber optic illumination system with 12V/150W Halogen illumination and built-in orange filter.
- Object Brightness: 38,000.00 Lx Min.
- Manual focusing control or Motorized focusing with foot control with adjustable Focus Range of 30mm.
- Motorized focusing speed: 2mm/s Max.
- Counterbalanced pantographic arm.
- Easily maneuverable optical head with tension control knobs and 2 handles.
- Microscope body can be rotated 315° when casters are fixed.
- AM-P6000D Series Dental Microscope comes with 31 inches post and AM-P6000E Series ENT Microscope comes with 41 inches post.



<b>Moticam 1</b>	Live Resolution: 800x600 pixels
	Optical Calculation 1/4"
<b>Moticam 1SP</b>	Live Resolution: 1.3 Mega pixels
	Optical Calculation 1/3"
<b>Moticam 2</b>	Live Resolution: 2.0 Mega pixels
	Optical Calculation 1/3"
<b>Moticam 3</b>	Live Resolution: 3.0 Mega pixels
	Optical Calculation 1/2"
<b>Moticam 5</b>	Live Resolution: 5.0 Mega pixels
	Optical Calculation 1/2.5"
<b>Moticam 10</b>	Sensor Resolution: 10 Mega pixels
	Optical Calculation 1/2.3"



COL-1320

**COL-1320, Colposcope****Features:**

- Hand polished optics for exceptional clarity.
- Individually adjustable binocular optics for true stereoscopic view.
- Optical measuring circles for precise measurements.
- Clear, bright LED light source that is longer lasting, gives more sure color balance, and is cooler to the touch than the standard halogen light source.
- Light intensity 6.5V /10,000 LUX.
- Focal length: 300mm.
- Magnification: 15x, 7.5x, and 3.75x.
- Field of View: 7.74mm, 15.5mm, 30.93mm.
- Depth of Field: 3mm, 4mm, 22mm.
- Smooth adjustable controls for gross and fine focus
- Optic Angle of binocular head is 45°.
- Universal Teflon ball joint never has to be tightened or adjusted & it gives you a fluid 360° motion for gross focus.
- Roller base for easy transport.
- Space saving small footprint: length is 14" and width is 12".
- Clutter reducing internal power cable.
- Working height: 33" to 49".
- One piece shipping that puts you in operation within minutes of opening the box (no assembly/installation necessary).
- Comes with color instruction booklet, dust cover to limit wear and tear, and two extra fuses.

MRC is proud to offer the COL-3000 Series Colposcopes. The lenses inside these colposcopes are made by Schott® Optical Glass imported from Germany, which offers excellent optic feature, such as high resolution, long depth of field, etc.



COL-3300

**COL-3300, Colposcope****Features:**

- Smooth three-step turret magnification changer.
- 300mm working distance objective lens offering 2.7x, 6.7x, and 16.7x magnifications. Optional magnifications/objective lens combinations are available.
- Widefield 12.5x eyepieces with diopter locks and fold-down rubber eye cups for eyeglass wearers.
- Straight binocular head F=160.
- Light Intensity on object plane: 38,000.00 Lux. Min.
- Fan cooled, \*\*dual-port variable fiber optic coaxial illumination with 15V/150W lamp.
- Maximum height from floor to objective lens: 1200mm.
- Minimum height from floor to objective lens: 1050mm.
- Green filter in selector knob.
- Small diameter base on roller castors with adjustable vertical post height.
- Spare lamp, dust cover and instruction manual.

\*\*should a lamp fail during an examination, the dual-port feature allows a quick change from one lamp to another resulting in an uninterrupted procedure.





COL-3500

### COL-3500, Colposcope

#### Features:

- Smooth five-step turret magnification changer.
- 300mm working distance objective lens offering 2.7x, 4.2x, 6.7x, 10.7x, and 16.7x magnifications.
- Optional magnifications/objective lens combinations are available.
- Widefield 12.5x eyepieces with diopter locks and fold-down rubber eyecups for eyeglass wearers.
- Straight binocular head F=160.
- Light Intensity on object plane: 38,000.00 Lux Min.
- Fan cooled, \*\*dual-port variable fiber optic coaxial illumination with 15V/150W lamp.  
\*\*should a lamp fail during an examination, the dual-port feature allows a quick change from one lamp to another resulting in an uninterrupted procedure.
- Maximum height from floor to objective lens: 1200mm.
- Minimum height from floor to objective lens: 800mm.
- Overall distance from the column to the objective lens: 1050mm.
- Green filter with selector knob.
- Spare lamp, dust cover and instruction manual.



COL-3900

### COL-3900, Colposcope

#### Features:

- Continuous zoom magnification system from 2.2x through 12.9x.
- 300mm working distance objective lens offering continuous zoom magnifications from 2.2x to 12.9x.
- Optional magnifications/objective lens combinations are available.
- Widefield 12.5x eyepieces with diopter locks and fold-down rubber eyecups for eyeglass wearers.
- Straight binocular head F=160.
- Light Intensity on object plane: 38,000.00 Lux Min.
- Fan cooled, \*\*dual-port variable fiber optic coaxial illumination with 15V 150W lamp .  
\*\*should a lamp fail during an examination, the dual-port feature allows a quick change.
- Maximum height from floor to objective lens: 1200mm.
- Minimum height from floor to objective lens: 800mm.
- Overall distance from the column to the objective lens: i050mm.
- Green filter with selector knob.
- Spare lamp, dust cover and instruction manual.



### AMP8000, LED Heading

AMP8000 brings you the most advanced lighting technology.

Our new LED headlight provides cool, bright, white light for procedures and examinations

The LED headlight is more than twice as bright as other standard LED and conventional headlights.

When you need well-defined illumination – without the heat of traditional halogen headlight – look at our new LED headlights providing superior quality and reliability.

#### Features:

- Light source: our LED lamp without the heat of traditional halogen headlight. with a color temperature of 6000 kelvin, this light supplies bright, white, shadow-free light allowing the doctor to see tissue characteristics without distortion.
- Enjoy the flexibility of operating the headlight by the use of the rechargeable lithium battery, without the use of direct power source.  
It is one of the most comfortable lightweight headlight and suitable for all kinds of surgery.
- The headlight could be used when it is charging.
- With low-battery indicator light.
- Smart design, convenient for mobile diagnosis.

Optical specifications		
Illumination light spot at 420mm distance (with iris diaphragm)	20–100mm	
Illumination in 250mm working distance	≥25000lx	
Adjustable range		
Fluctuation distance	12.5mm	
Angle	Range vertical ±25°	
Weight		
Head lamp (excluding head band)	70g	
Electrical Specifications		
Illumination source	Extremely bright light, 3W LED, life 20000 hours, continuous burn, does not need to change the LED lamp	
Battery	7.2V Lithium battery	
Battery run time	Not less than 2.5 hours continuous run time on a fully charged battery	
Voltage	220V AC/110V AC	
Maximum input power	15W	
Electrical safety standard	GB9706. 1, Class II type BF equipment	
Environment requirements		
Use condition	Environment temperature	+10°C~+40°C
	Relative humidity	30%~75%
	Atmospheric pressure	700hPa~1060hPa
Shipping and stock	Environment temperature	-40°C~+55°C
	Age relative humidity	10%~90%
	Atmospheric pressure	500hPa~1060hPa



FAM-100

### FAM-100, Fast Mill with flexible speed setting

- Rapid reduction from 15 mm to 40 µm
- Quick and easy to clean
- Full range of accessories
- Digital speed setting

#### Work principle:

The sample is grounded to powder by impact and shearing effects. First, the sample is feed to the hopper, then thanks to strong centrifugal force, the sample is thrown against the wedge-shaped rotor, where the sample is crashed. Then the sample goes through the rotor & the fixed ring sieves for final grinding, you can manually stop the machine and collect the sample.

#### Advantages:

- Wide range of accessories including various collection and feeding systems, rotors and sieves.
- Variable speed setting between 7,000–20,000 rpm.
- Easily exchangeable grinding and sieve parts.
- Final product size can be determined by using ring sieves with aperture sizes from 0.08–8mm.

#### Various rotor and ring sieves

- 6/12/24 tooth rotor are available
- The rotor can be made of stainless steel or pure titanium
- Sieves may come in standard ring model, reinforced rim and distance sieve.

#### Applications

- Agriculture
- RoHS
- Environment
- Coal
- Soil
- Chemistry / plastics
- Electronics
- pharmaceuticals



### Grinding Examples



Technical Data	FAM-100
Electrical details	230V/50 Hz
Dimensions WxHxD	400x460x450mm
Net weight	35kg

Features/Performance	FAM-100
Application field	soft, medium-hard, brittle, fibrous
Feeding size	< 15 mm
The End-fineness	< 40 µm
The speed setting	7,000–20,000 rpm
The collecting cassette volume	standard 900ml
The rotor speed setting	7,000–20,000 rpm
Rotor peripheral speed	29.83–99.43m/s
Rotor diameter	95mm



**SM-400/SM-400C, Sample Mills with removable cup**

For dry grinding of hard and brittle substance, mainly used in agriculture for grains, seeds, spices, leaves, tobacco and woods. Brewery for Hop, malt pellets, chemical industry for salt, molecular sieves, detergents and pigments. Energy industry for coal and coke.

This high power model is for laboratory use. Its speed is over 18,000rpm & the cutter blade is easy to clean. Heavy duty motor. It can reduce grinding. In general, sample can be grounded in less than 30 seconds. The samples cup is made of stainless steel, SUS#304. Use for crumbing iron alumina, bone, drugs, & seeds except anything wet & greasy. Optional cup with cooling jacket is available as shown in picture (SM-400C). With transparent cover to observe material inside cup.

Model	SM-400	SM-400C
Speed (rpm)	0-18,000	
Cup Inner Dimensions	Ø90 x 65H(mm)	
Volume	400CC	
Max. Capacity (gram)	150	
Overall dimension(mm)	Ø220 x 300H	
Cooling jacket	No	Yes
Net weight	8kg	10kg
Power	AC110V/220W/4A	



**SM-450/SM-450C, Sample Mills**

**Features:**

- Compact size. The main body shell, container and lid are stainless
- The container unit and machine body are separated; users can take off the container unit for dry cleaning after using. (Users also can purchase a few container units for alternate using.)
- Useful to crush dried food, drugs, alumina, bones, grains, seeds, porcelain, mineral etc. (You can purchase the special processed blade for crushing harder materials like porcelain, mineral, etc.)
- Cooling-type mill is based on cooling the temperature by a water circulation system to reduce the temperature inside the container. (The increasing temperature inside of the container should be possible to destroy the samples.)
- Optional: -transparent lid to observe material inside cup. -Lid for small quantities.

Model	SM-450	SM-450C
Motor	1200W	
Speed (rpm)	0-30,000	
Body Size	Ø170 x 330H(mm)	
Cup Inner Size	Ø108 x 51H(mm)	
Volume	300CC	
Max. Capacity	150ml	
Cooling jacket	No	Yes
Net weight	5.1kg	6kg
Power	AC110V/220V, 50/60Hz	



**KM-Series, Knife Mills for hard dry materials**

**Features:**

- Durable motor.
- Made of SS304.
- Fast & efficient grinding.
- Easy operation.
- No premixing.
- Low maintenance.

This model is equipped with special pressure hoods which makes it possible to mill leaf, branches, wood, bones, seeds, dry food, building materials and chemical, into flour like powder in large quantities and during short operation time. Shouldn't be used with wet or greasy samples.

- Easy replacement of blade knives.
- Applications: grain, seeds, spices, rice, wheat, salt, bonds, wood, leaves, tea leaves, tobacco, pigments, detergents, roots, stems, coal, coke, tablet, pills.
- Used in building materials in dust, Chemical industry, Medical industry, Paint and Varnish industry, Pharmacy industry.

**Emptying of model KM-1500**



Model	KM-400	KM-700	KM-1500
Speed (rpm)	28,000		
Cap dimensions (mm)	Ø110 x 45H	Ø130 x 55H	Ø160 x 75H
Volume	400CC	700CC	1500CC
Max. capacity	150ml	200ml	375ml
Motor	700W	1000W	1350W
Overall DIM. (mm)	Ø134 x 270	Ø162 x 298	Ø270 x 300
Net Weight (kg)	3.6	4.6	10
Power	AC110V/220V, 50/60Hz		

**Grinding Examples of KM-1500**





PMG-100

**PMG-100, Power Mortar Grinder**

**Dry Grinding / Wet Grinding / Ultra Fine Grinding / Cryogenic Grinding • Mixing • Cell disruption for DNA / RNA extraction • The PMG-100 can handle samples from 10 up to 200ml.**

**Method of operation**

The Mortar Grinder Model PMG-100 is used to reproduce grind, homogenize and mix a wide range of solid materials in dry / wet or cryogenic condition. The material to be processed falls into the Pulverizing area between the mortar and pestle by top feeding via the opening at the inlet cover. The material is then pulverized and mixed between the mortar inner surface area and the bottom of the pestle. In order to match the necessary top pressure with the requested end fineness and the breaking behavior of the sample to be prepared the PMG-100 is equipped with adjustable.

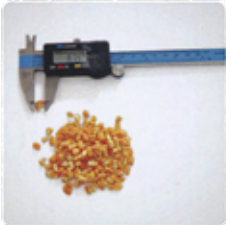


Top Pressure Mechanism with scale and a variable speed setting of 50-130 rpm and a flexible scraper setting. Only due to the combination of this 3 key adjustment features a wide range of sample preparation tasks can be reached. No other grinding system is more easy to clean than the PMG-100 Mortar Grinder. When the grinding process is finished the mortar and pestle can be removed by a bayonet lock in order to perform a quick cleaning of the grinding tools.

**Grinding and Mixing Examples**

Before

After



Different food stuff such as maize, grain etc.



Different tablets & pharmaceutical raw materials



Soil samples

**Grinding, homogenizing, triturating**

The Mortar Grinder is the central machine in a sample prep. This system is suitable for fine grinding of any dry substance, as well as for suspensions with different viscosities for analysis, quality control and material testing. It is perfectly suitable for the homogenization of cremes and pastes. Typically samples with a feed size of up to 8-10mm and a total batch of up to 200 ml (volume depending on the characteristic of the samples) can be ground down to 10-20µm.

**High operator convenience and maximum safety**

Maximum grinding performance and maximum safety is important for MRC mills. Due to an integrated safety switch the machine can only be started when the "Easy Lock Cover" is closed. The "Adjustment mechanism" allows the simple and fast settings and fine adjustment. The cover as well as the housing of the PMG-100 is made from solid steel. The ergonomic design of the machine and the front panel ensures the easy and simple setting of all working parameters.

**Performance features PMG-100**

Extremely easy to clean • Suitable for dry, wet & cryogenic grinding • Sample material can be added during the milling process via cover inlet • Digital time and speed setting • Precise and optimized results due to variable speed 50-130rpm • Meet all application tasks due to a wide selection of grinding tools for the mortar and the pestle • Meet all application tasks due to a wide selection of scraper materials (Vulkollan, Teflon, Beach wood) • Positioning and removal of mortar and pestle without tool • Precise and reproducible pestle setting due to scale adjustment • Solid steel housing • Optional pre-crushing for coarser materials.

**Selection Guide Recommended Grinding Set (Mortar and Pestle)**

We recommend always to use the same material composition for mortar & pestle.

Material of grinding set	Feed size	Recommendation				
		Wear behavior	Type of sample characteristic	Dry	Wet	Cryogenic
Stainless steel	10mm	Good	Middle hard, brittle samples	Yes	Yes	Yes
Hardened steel	10mm	Good	Middle hard, brittle samples	Yes	No	No
Tungsten carbide	10mm	Very good	Middle hard, brittle samples	Yes	Yes	Yes
Agata	8mm	Good	Soft to medium hard samples	Yes	Yes	No
Sintered alumina	8mm	Normal	Soft to medium hard samples	Yes	Yes	No

**Applications**

- Cocoa beans / chocolate paste etc ...
- Food and animal food
- Maize, beans
- Creams, emulsions
- Soil samples
- Minerals
- Glass, ceramics
- Cement clinker, cement.

**Grinding media- available in 7 different materials**

- Stainless steel
- Hardened steel
- Tungsten carbide
- Agate
- Sintered corundum
- Zirconium oxide
- Hard porcelain.

**Benefits**

- 7 different grinding media available
- 3 different scraper materials available
- Fast and extremely easy to clean
- Variable speed setting 50-130 rpm
- Digital time setting
- Digital speed setting
- No tool required to open
- No tool required to take off pestle
- No tool required to take off mortar
- Dust tight milling chamber
- Wet grinding
- Dry grinding
- Cryo grinding.

Technical Data	
<b>Electrical details</b>	100-120/200-240 Volt 50/60 Hz
<b>Speed</b>	50-130 rpm adjustable
<b>Motor Power</b>	180 Watt

Transport Data	
<b>Gross dimensions w x d x h</b>	App. 580x580x600mm
<b>Net dimensions w x d x h</b>	App. 400x460x480mm
<b>Gross weight</b>	39kg
<b>Net weight</b>	34kg

Features/Performance	
<b>Working principle</b>	Friction
<b>Feed size maximum</b>	8-10mm depending on sample
<b>Quantity max. / min.</b>	200ml/10ml
<b>Endlineness maximum</b>	10-20µm
<b>Grinding time setting</b>	1-99min./cont.
<b>Speed setting</b>	50-130rpm
<b>Start/Stop button</b>	1
<b>Pressure setting</b>	by scale adjustable
<b>Pestle adjustment</b>	by adjustment wheel (analog)
<b>Scraper adjustment</b>	by adjustment wheel (analog)



S.S Mortar & Pestle

Agate Mortar & Pestle



KM-100

**KM-100, Tablet Grinder for Pharmaceutical Laboratories**

- Made of cast steel and aluminum
- Separated Grind container
- Powerful disintegration device
- Grinding time: 1~60sec
- Power cut off automatically
- Fast & efficient grinding
- Easy Operation
- Adjusted speed and timer.



Cup made of PC with transparent cover to observe material inside the cup.

- Quiet operation
- Transparent chamber to observe the inside powder
- Safety - sealed housing to protect user
- Perfect milling results
- Large applications range: Pharmaceutical tablets, vitamin pills, grains, seeds, leaves, salt, detergents, coal, coke, rice.

Model	KM-100
<b>Speed</b>	2,000~10,000rpm
<b>Timer</b>	1~60 seconds
<b>Power</b>	AC110V/220V, 50/60Hz
<b>Outline Size (mm)</b>	220x160x260
<b>Net Weight (kg)</b>	4.7



**MBM-100**

### MBM-100, Micro Ball Mill

**Mechanical Alloying Cell disruption for extraction** • The MBM-100 can handle simultaneously two or more samples from 0.2ml up to 50 ml.



### High operator convenience and maximum safety

Maximum Grinding performance and maximum safety is important for us at MRC. Thanks to an integrated motor break, the machine can only be started when the "Easy Cover" is closed. The unique "Easy Clamp system" allows the simple and safe clamping of all grinding jars up to 50ml. The integrated stainless steel drawer can be taken off for cleaning. The grinding chamber, easy clamp system as well as the swinging arm are made from high precision stainless steel to meet all food & pharmaceutical requirements. Thanks to the new motor concept and a direct motor drive, MRC MBM-100 is maintenance free.

### Grinding, blending, cell disruption of samples

The MRC MBM-100 typical Processing time is at 30 seconds. The MBM-100 can prepare 2 or more samples from 0.2ml of up to 50ml. It is designed as well for high-sample-throughput.



### Selection Guide jar filling

Recommend balls fillings for grinding jars and for static mixer

Grinding jar volume	Feed size	Recommended ball filling					
		2mm	3mm	12mm	15mm	20mm	25mm
2.00ml	1mm	3-4pcs.	2-3pcs.				
25.00ml	6mm	To be calculated in ml		2-4pcs.	1-2pcs.	1 pcs.	1 pcs.
45.00ml	7mm			4-7pcs.	2-3pcs.	1 pcs.	
50.00ml	8mm			5-8pcs.	3-4pcs.	1 pcs.	1 pcs.

### Application areas:



Grinding jars of various material up to 50ml.



Micro vial adap plate for micro vials



Holder for mixing dry substan (XRF Prep)



4 Liters Ice bath with cover for cryo applications



**Advantages:**

Thanks to the unique combination of wide range of grinding jars made from various materials the MBM-100 is capable to practically meet all demands of today's laboratory needs.

**Applications:**

- Grinding (wet and dry)
- Cell disruption
- Mixing XRF Prep
- Turbulent blending (Static Mixer)
- Cold grinding

Due to the combination of high energy vibration and the punch of the grinding balls the MBM-100 can grind hard and brittle materials as well all as medium-soft, soft materials and elastic materials.

**Benefits:**

- Universal and highly efficient grinding, blending and disruption
- Large range of grinding jars and accessories
- Extremely short processing time
- Designed for high sample throughput
- Reproducible results by digital pre-setting of all working parameters.



**Ice bath for cryogenic grinding:**

For heat sensitive materials such as plastics and rubber it is possible to embrittle the material with liquid nitrogen and perform an additional external freezing of the fast clamping jars. Those jars are either made from Teflon or from stainless steel and are suitable for cryogenic grinding applications.

**Fast clamping jars for**

- Dry grinding
- Wet Grinding
- Ultra Fine Grinding
- Mechanical alloying.



**Micro vials**

PTFE, POM, pc Micro vials are used for cryogenic grinding of small sample amounts or for standard grinding applications of small samples.



**Micro vial holder for cell disruption**

- Micro vial adapter for 6 micro vials
- Micro vial adapter for 10 micro vials
- Micro vial adapter for 24 micro vials
- Micro vial adapter for 96 micro vials

Designed for high analytical screening, the MBM-100 efficiently and safely disrupts samples of spores, microorganisms, plant and animal tissue or soil samples.

The samples, along with extraction media and small metallic or ceramic balls, are placed in micro vials. After 2 minutes of preparation in the MBM-100 more than 95% of the cells are disrupted. Because the balls and the vials plates are disposable, the method is ideal for PCR, PAGE, and Probe applications where cross contamination between samples cannot be tolerated.



Linoleum: 50ml steel jar/20mm steel ball  
200 micron after 60 seconds.



Leaves: Micro vial adapter plate/Micro vials/3mm tungsten carbide bead per vial. Completely homogenized.



Minerals: Pebbles  
50ml steel jar/  
20mm steel ball  
40 Micron after 45 seconds.



Wood: 50ml steel jar/  
20mm steel ball  
200 Micron after 90 seconds.



Honey/Water:  
160ml steel jar/Static Mixer  
Homogeneous Mixture.



Rubber:  
50ml steel jar/20 mm steel Ban after cryogenic grinding.

Technical Data	
Electrical details	100-120/200-240Volt 50/60 Hz
Motor Power	200 Watt

Transport Data	
Gross DIM. w x d x h	App. 370x330x470mm
Net weight	26kg

Features/Performance	
Working principle	Vibration
Feed size maximum	10mm
Quantity max. / min.	100ml/0.2ml
Endlineness maximum	5µm
Digital preselection of vibrational Frequency	200-2100rpm



### PBM-4, Planetary Ball Mill

- Quick and easy cleaning
- Rapid fine crushing
- Easy exchange of grinding jars and balls
- Grinding jars and balls are made from a wide range of materials
- Grinding jar volume up to 500ml
- Progr. control
- End fineness < 1µm.

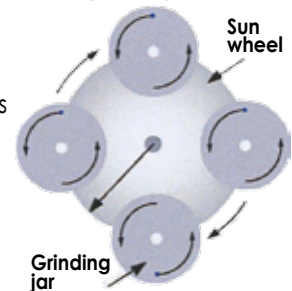
### MRC Planetary Ball Mills for fine grinding of soft, hard to brittle or fibrous materials

The MRC Planetary Ball Mills are used for fine grinding of soft, hard to brittle or fibrous materials. Dry and wet grinding are possible. They support the daily sample preparation for laboratory- and development usage.

#### Working principle:

MRC Planetary Ball Mills consist of several cylindrical grinding jars (positioned on the sun wheel as shown in the figure) which are filled with loose grinding balls. Two superimposed rotational moves the grinding jars: Like a planetary system the grinding jar rotates on an orbit around the centre. This rotational movement is the self-rotation of the grinding container superimposed. The resulting centrifugal and acting acceleration forces lead to strong grinding effects. As well as coriolis acceleration. The result is an intensive grinding effect between the grinding balls and the sample.

There are different rotational ratios. With a rotation ratio of 1 :-2 the grinding jar rotates twice during a sun wheel turn. The minus of this case indicate the opposite rotation direction.



The movement patterns of the sample/grinding balls/can be modified according to the speed ratio between the sun wheel and the jars. One option is for sample to be slammed against the jar warts and stressed. Another option will allow for the grinding balls to roll over the sample.



#### Benefits:

- High efficient fine grinding up to end fineness < 1µm
- Different speed ratios available
- Grinding jars from 12ml to 500ml made from different materials
- Suitable for long-term trials and continuous use
- Automatic direction reversal to avoid agglomerations
- Reproducible results thanks to progr. grinding parameters.

**Grinding jars:** The selection of the right grinding jar and the correct filling level has a big impact on the grinding result. According to the application you have to select the correct material and amount/volume for the grinding jar and the grinding balls. The jar filling should consist of about 1/3 sample and 1/3 ball charge. The remaining third is the free jar volume that is necessary for the movement of the balls. The following table provides recommendations.

#### Operation:

MRC Planetary Ball Mills enable the convenient programming of the following grinding parameters:

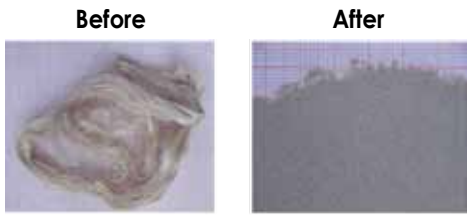
- Grinding duration in hours and minutes
- Speed
- Speed ratio (speed sun wheel: grinding jar).

#### Selection guide for grinding jars and balls:

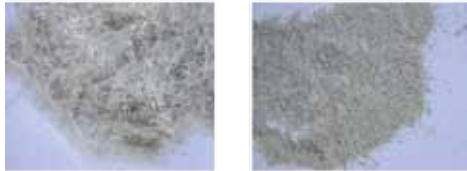
We recommend always to select grinding jars and balls built from the same material.

Nominal volume	Sample amount	Recommended ball Charge				
		Max.feed size	10mm	20mm	30mm	40mm
12ml	5ml	<1mm	5pcs.	-	-	-
25ml	10ml	<1mm	8pcs.	-	-	-
50ml	5-20ml	<3mm	10pcs.	3pcs.	-	-
80ml	10-35ml	<4mm	25pcs.	5pcs.	-	-
125ml	15-50ml	<4mm	30pcs.	7pcs.	-	-
250ml	25-120ml	<6mm	50pcs.	15pcs.	6pcs.	-
500ml	75-225ml	<10mm	100pcs.	25pcs.	8pcs.	4pcs.

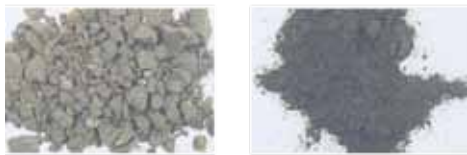
### Grinding and Mixing Examples:



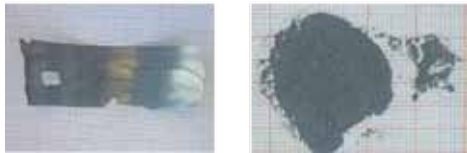
**Wood Fiber**



**Feather**



**Mineral**



**Metal Plate**

### Applications:

- Flour
- Wood fibres
- Plant Materials
- Seeds
- Tobacco
- Bentonite
- Concrete
- Gypsum
- Sand
- Stone
- Cement clinker
- Hair
- Bones
- Tissue
- Carbon fibres
- Plastics
- Paints and lacquers
- Catalysts
- Pigments
- Polymers
- Cellulose
- Glass
- Hydroxyapatite
- Kaolin
- Ceramic oxides
- Quarz
- Clay minerals
- Ores
- Semi-precious stones
- Cole
- Coke
- Alloys
- Metal oxides
- Slags
- Sludges
- Electronic scrap
- Organic and inorganic waste

### Specifications:

Technical Data	
Electrical requirements	100-120/200-240 Volt 50/60 Hz
Motor Power	180 Watt
Transport Data	
Dimensions closed w x d x h	Ca. 759x645x550mm
Weight	34kg

### Grinding jars available with different liner:



- Stainless steel
- Agate
- Hardened steel
- Sintered corundum
- Tungsten carbide
- Zirconium oxide

### Features of grinding jars:

The grinding jars are built from one block of steel or built with a stainless steel protective jacket with liner from the above materials.

MRC grinding jars unique advantages:

- Safe, with stainless steel protective jacket
- Easy opening according to gap between lid and jar
- Self-centring base of grinding jar
- Gas-tight and dust-proof sealed by o-ring
- Labels field.

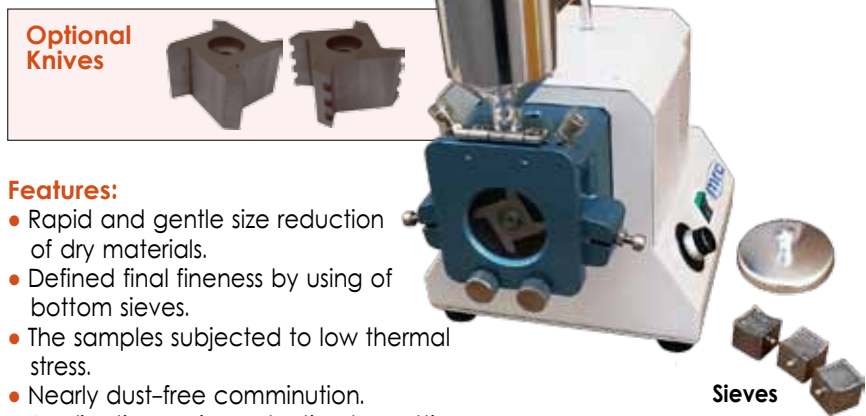
Features/Performance	
Working principle	Impact, Friction
Feed size maximum	<10mm
Number of grinding jars	8/4/2
Max. volume of each grinding jar	250ml
Min. volume of each grinding jar	10ml
Max. end fineness	<1µm; <0, 1µm for colloidal grinding
Adjustment of grinding duration	Digit. adjustable
Start / Stop Function	1
Setting of grinding time	Digital, 00:00 to 99:59
Interval operation	yes, with direction reversal
Pause time	00:00 to 99:59
Speed Ratio	1:-2; 1:-2.5; 1:-3
Sun wheel speed	50 - 400 min <sup>-1</sup>
Effective sun wheel diameter	360mm

### CM-5000/CM-20,000, Cutting Mills

The CM-5000 & CM-20,000 are economically powerful cutting mills that are particularly suitable for size reduction of soft, medium-hard, elastic or fibrous materials, whose size can be reduced without requiring the use of extremely high forces.

#### Function Principle:

Size reduction in the cutting mill CM-5000 takes place by cutting and shearing forces. The sample passes through the hopper and into the grinding chamber where it comes into contact with a rotor equipped with 4 cutting blades; it is comminuted between the blades and the four stationary cutting bars inserted in the housing. The chamber dwell time is short; as soon as the sample can pass through the openings of the bottom sieve it is discharged and collected in the receiver. It ensures gentle, rapid and nearly dust-free size reduction. Ground product is quickly discharged by using a filter bag or a ring filter.



#### Features:

- Rapid and gentle size reduction of dry materials.
- Defined final fineness by using of bottom sieves.
- The samples subjected to low thermal stress.
- Nearly dust-free comminution.
- Applications - size reduction by cutting.
- Field of application - agriculture, biology, chemistry/plastics, construction materials, environment, food, medicine/ pharmaceuticals, mineralogy/metallurgy
- Feed material - soft, medium-hard, elastic, fibrous.
- Size reduction principle - shearing, cutting.
- Material feed size - Ø50mm.
- Final fineness - 0.25-20mm.
- Sieve sizes - 0.25mm, 0.42mm, 0.84mm.
- Quick & easy cleaning.



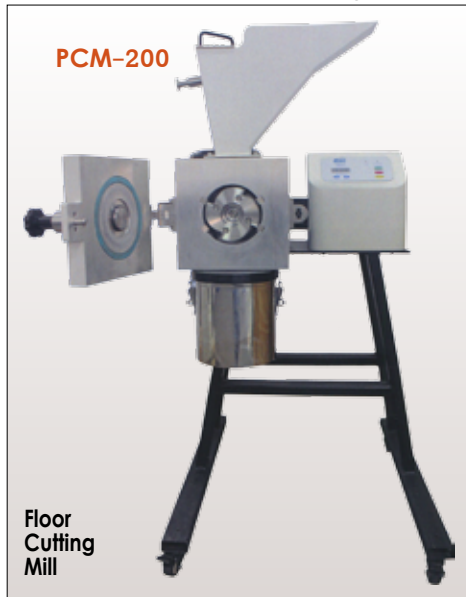
#### Main areas of Applications:

Electronic cards, cables, computer & electronic waste, plant materials, plastics, rubber, spices, wood, drugs, feeds, foils, leather, light metal scrap, lignite, non-ferrous metals, organic & inorganic waste, paper, straw, secondary fuels, grain, seeds, resins, textiles and bones.

Model	CM-5000	CM-20,000
Mesh(m/m)	20,40,60 (option: 10,14)	≤0.5,1,2
Inner cutting put	Ø5cm	Ø20cm
Cap.	5kg/H	20kg/H
Motor	200W	750W
Size(mm)	W210xD290xH240	W350xD580xH1100
Power	AC110V/220V, 50/60Hz	

## PCM-100, PCM-200, Power Cutting Mills

- Rapid reduction of large particles from 80 mm to 0.25 mm
- Quick and easy cleaning
- Full range of bottom sieves
- Collector volume 5,000 ml
- Digital speed setting.



**Method of operation:** The Models PCM-100/200 Cutting Mills is used by Laboratories & Processing Companies to granulate solid materials such as waste of wood and thermoplastics. The material to be processed falls into the cutting chamber of the mills via an upper chute and is shredded by cutting between rotating and fixed knives until it passes an attached sieve as ground product. The sieve extends over the lower half of the grinding chamber and is easily exchanged. Final particle size is determined by the selected sieve perforation aperture. No other Cutting Mill is easier to clean than the PCM-100/200 Cutting Mills. When the grinding process is finished the front door can be opened sidewise and the rotor / infeed hopper can be taken out in order to perform a fast and systematic cleaning of the grinding tools.

Acoustic Noise Reduction Infeed Hopper made from Bondal. Bondal is a vibration damping composite material with a sandwich structure consisting of a viscoelastic core between two outer steel sheets. Various infeed hopper types are available with wooden / teflon plunger.

Massive grinding chamber made from vibration reducing components

Solid door with safety switch for easy access and cleaning

Solid 5 Liters sample collector

High precision solid steel under frame with industrial caster wheels (lockable)

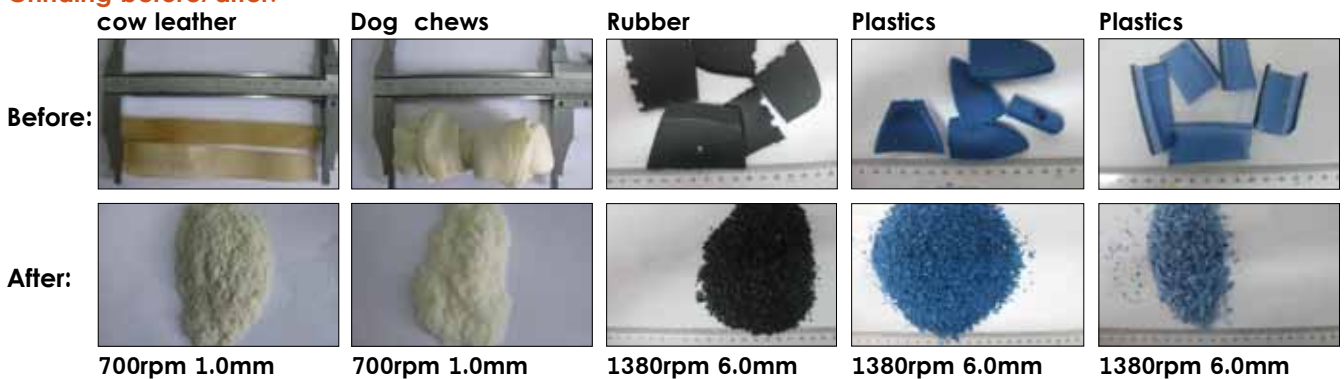
### Infeed Hopper of var. sizes:



### Applications:

- Linoleum, Carpets, Cloth
- Secondary fuels and Bio Mass
- Food & Animal food
- Wood, Paper, Carton, Cellulose
- Rubber, Shredder Light Fractions
- House Waste, Industrial Waste
- Computer Scrap and Electronic Scrap
- Plants, Twigs, Roots etc.
- Herbs, Spices, Gras, Straw
- Bones
- Technical Plastics such as ABS, PA, POM, PE etc.

### Grinding before/after:



### Rotor and Stator knives:



Technical Data	PCM-100	PCM-200
Electrical details	230V/50 Hz	
Speed	150-3000 rpm	500-3000 rpm
Motor Power	1500watt	3000watt
Features/Performance	PCM-100	PCM-200
Working principle	Cutting	
Feed size maximum	Up to 80mm depending on sample	
Quantity max. / min.	5000ml/50gr.	
Final product size	250µm	
Number of rotor knives	3	
Number of stator knives	4	
Start/stop function	by on/off button	
End fineness adjustment	by interchangeable bottom sieves	
Weight	68 kg without under frame 90 kg with under frame	

Ball mill is a grinder for reducing hard materials to powder. A ball mill grinds material by rotating a cylinder with balls causing the balls to fall back into the cylinder and onto the material to be ground. The cylinder rotates at a relatively slow speed, allowing the balls to cascade through the mill base, thus grinding or dispersing the materials. Ball mills are generally used to grind material 7mm and finer, down to the particle size of 20 to 75 microns.



**RJM-30D**  
BenchTop Small Ball Mill

#### RJM-30D, Small Ball Mill

##### Features:

- Fixed speed & stepless speed change.
- Digital speed meter is available.
- Suitable for different size mill pots.
- Roller distance can be adjusted.
- Timer can be added separately.

Model	RJM-30D
Speed	0~480rpm
Timer	99hours: 59min
Pot size	6.5cm~8.5cm
Roller	Ø5mm
Motor	60W
Outline Size (mm)	550x310x220
Power	220V/50Hz

The unique operating characteristics of our Jar mill satisfy the most requirements of the chemical, ink, paint, plastics, food and pharmaceutical industries. Our jar mills are ideal for R&D, small production runs, for grinding laboratory or high-purity samples. These mills provide quiet and smooth operation.

- Single or multi-tier design, two or three jars per tier
- No cross-contamination between samples
- Easily adjustable rollers and brackets to accommodate different jars of various diameter
- The speed can be varied
- Position adjustment for roller for different diameters of jars.

Rollers easily adjust to accommodate a variety of jar diameters—no clamping or fastening required.



**RJM-102**  
Floor Ball Mill

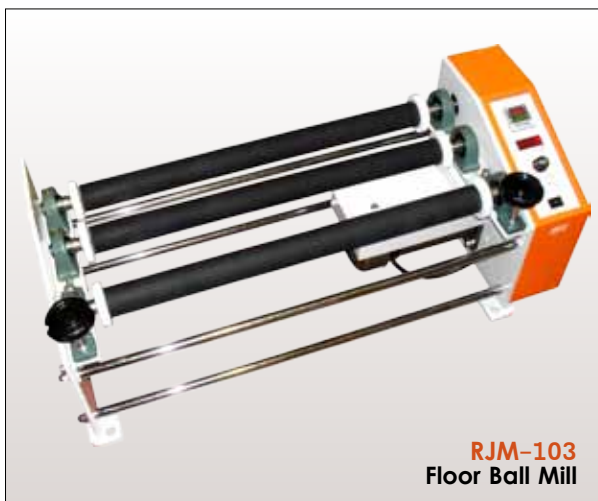
#### RJM-102, Large Ball Mill

##### Features:

- Digital Large Ball mill, 2 rollers.
- Speed range: up to 600 rpm.
- Pot diameter:120~300mm.
- Roller length: 650mm, Max. load: 40kg accept couple of mill jars together.
- Timer: up to 99 hours:59 seconds.
- Dimensions: W97xD36xH41cm.
- Power 400watt.

Model	RJM-102
Speed	0~600rpm
Timer	99hours: 59min
Pot size	12cm~30cm
Motor	300W
Outline Size (mm)	W100xD410xH380
Power	AC110/4A AC220V/2A

A horizontal cylinder is rotated at a predetermined speed that sets the balls into a tumbling and cascading motion which impact the solids in a very predictable and controllable fashion. Because the process takes several hours, the particles will not only be finely milled, but will exhibit a narrow particle size distribution. They are used widely in the chemical, paint, coatings, and ceramics industries.



**RJM-103**  
Floor Ball Mill

#### RJM-103, Large Ball Mill-3 Adjustable Roller

##### Features:

- Digital Large Ball mill, 3 rollers.
- Speed range: up to 600 rpm.
- Pot diameter:70~130mm.
- Roller length: 650mm, Max. load: 40kg accept couple of mill jars together.
- Timer: up to 99 hours:59 seconds.
- Dimensions: W97xD36xH41cm.
- Power 400watt.

Model	RJM-103
Speed	0~600rpm
Timer	99hours: 59min
Pot size	Ø7~13cm
Motor	400W
Outline Size (mm)	W970xD410xH360
Power	AC110/4A AC220V/2A

- **High efficiency** – Due to the relatively slow rotational speed but large mass of media, more of the energy goes into milling and less wasted as heat.
- **Narrow particle distribution** – Solids milled in tumble mills are normally so fine and consistent in size that it's rare to require classification.
- **Repeatable results** – Mill operating parameters including rotational speed, media size and milling duration can be independently controlled with known effect on the final results.
- **Low temperature** – Because of the high efficiency of milling and low heat generation, the solids will not be exposed to high temperatures. For extremely heat sensitive products, cooling jackets can be provided on the mill cylinder.
- **Chemical containment** – Solids are sealed and contained inside the mill, protecting the environment and operators.



RJM-304

### RJM-304, Large Ball Mill, 3 Stages

Model	RJM-304
Speed (RPM)	0~420
Pot size (cm)/DIM	Ø9~Ø24
Roller Ψ (cm)	Ø5
Motor	400W
Timer (hrs)	0.1~99.9
Outline size (cm)	W142xD68xH182
Power	AC220V, 50/60Hz

### Mill Pots

Model	Speed rpm	Useful Cap.	Total Cap.	Size (mm)
Mill pot 4	130	500	800	Ø120x150
Mill pot 5	110	1,000	1,600	Ø150x180
Mill pot 6	90	2,000	2,800	Ø180x210
Mill pot 7	85	3,000	4,500	Ø210x240
Mill pot 8	75	5,000	7,500	Ø240x300
Mill pot 10	60	10,000	15,500	Ø300x360

### Balls for Mill Pot

Recommendations for ball fillings	Mill pot no.	Capacity approx. ml.	Ball Ø			
			42K-9 9mm	42K-15 15mm	42K-20 20mm	42K-30 30mm
	4	500	0.05kg	0.1kg	0.1kg	
	5	1000	0.1kg	0.2kg	0.2kg	
	6	2000	0.2kg	0.4kg	0.4kg	
	7	3000	0.3kg	0.6kg	0.6kg	
	8	5000	0.5kg	1.0kg	1.0kg	
	10	10000	0.5kg	1.5kg	1.5kg	1.5kg
No. of balls per kg approx.			425 pcs.	130 pcs.	90 pcs.	16 pcs.
Bulk density of balls per Liter approx.			1885g	1930g	2000g	1800g



**CCM-10/15/20, Vertical Crushing Machine**

**Features:**

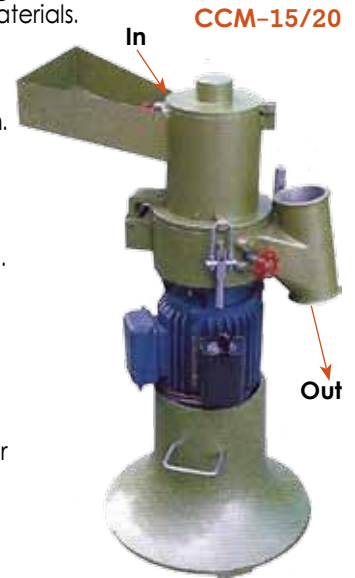
The vertical crushing machine uses the traditional grinding method to break the sample. It's designed to use the centrifugal force of the motors tungsten carbide blade to achieve high crushing efficiency. Input volume is adjustable. It is suitable for laboratory purpose.

- Suitable for fine grinding and coarse crushing. Not to be used with wet, greasy, sticky, fibre rich materials.
- Continuous operation.
- Easy replacing mesh sieves.
- Up to 6 different mesh sieves
- Grinding particle size. Not bigger than 30mm.
- Size after grinding 0.3 - 13mm.
- Capacity 3-5kg/hour.
- Power supply, NH-34-34S: AC100V 50/60Hz  
NH-20/3 phase 200V.
- The processing hammer is made of Tungsten.
- Stainless steel tank, inner funnel aluminium, outer funnel stainless.
- Blades speed 3600 RPM.

Sieves included	
0.3mm	2pcs.
0.4mm	1pcs.
0.5mm	1pcs.
3mm	1pcs.
8mm	1pcs.
13mm	1pcs.

**Sieves:**

Interchangeable sieves for insertion into the grinding heads ensure maximum particle size filtering.



Model	CCM-20	CCM-15	CCM-10
<b>Speed (rpm)</b>	3600		
<b>Type</b>	Floor cut mill		Table cut mill
<b>Motor</b>	2HP	1.5HP	1HP
<b>Weight (kg)</b>	85	70	25
<b>Cap size (mm)</b>	W240xL120	W180xL100	W70xL110
<b>Power</b>	220V, 50/60Hz		110V/220V 50/60Hz



**CGM-20, Leading-Coming-Air Grinder**

**Features:**

- Mineral substances, fiber and adhesive substances.
- Wind is used to cool the grinder for continuous operation.
- Size of particles: 150 mesh & above.
- Ordinary herbal medicine: 0.6kg per 10 minutes.
- Adhesive substances: 0.6kg per 15-20 minutes.



Model	CGM-20
<b>Speed</b>	30,000 RPM
<b>Weight</b>	14kg
<b>Dimensions(mm)</b>	W320xD300xH530
<b>Power</b>	AC110V/220V, 50/60Hz, 2Hp

Knives included	12-4, Center
12-1, Straight blade	Use for the materials in general, fiber, & tough quality such as pearl, gentian & liquorice
12-3 Big curve blade	Use for the materials in powder, fiber, & viscosity quality such as gentian & medlar
12-2 Medium curve blade	Use for the materials that straight blade can not pulverize. Or when use the big curve blade but can not achieve the tiny powder, use this blade





RW-Series



RM



RTM

**RW-12/06/03-RM-RTM, Small Analog, 45Watts**

**Features:**

- For simple stirring tasks of up to 10Liters (H<sub>2</sub>O).
- Small high torque motor, quiet, vibration less.
- Shaft and chuck are in stainless steel.
- Easy height adjustment.
- All-in-one design with an auto heat protection.
- Auto fuse cut-off when overload. Stable speed.
- Wide torque and speed selections, can match the different viscosity and volume.

**Option:**

- RM model with needle tachometer.
- RTM model is equipped with digital speed and torque meter.

**Accessories:**

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:**

W400xD315xH54mm, 8kg.

**Holder**

**Pole**



Model	RW-12	RW-06	RW-03
<b>Motor</b>	DC45W		
<b>Speed (rpm)</b>	200~1200	100~600	50~300
<b>Torque (kg-cm)</b>	2.5	5	10
<b>Viscosity (1000 cps/L)</b>	20	50	100
<b>Body size (mm)</b>	E Type: W130xD180xH170, RM/RTM Type: W157xD180xH178		
<b>Body net weight (kg)</b>	4.3		
<b>Power</b>	AC110/220V, 50/60Hz, Single Phase		



RD-12

**RD-12/06/03, Small Digital, 60Watts**

**Features:**

- For simple stirring tasks of up to 10Liters (H<sub>2</sub>O).
- Digital speed meter display.
- Torque meter in analog display.
- All in one construction with sealed enclosure, Quiet operation.
- Torque increase automatically in high viscosity, with a constant speed.
- Fuse cut-off automatically when it is overheat.
- Stainless steel chuck.

**Accessories:**

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:** W400xD315xH54mm, 8kg.

**Holder**

**Pole**



Model	RD-12	RD-06	RD-03
<b>Motor</b>	DC45W		
<b>Speed (rpm)</b>	200~1200	100~600	50~300
<b>Torque (kg-cm)</b>	2.5	5	10
<b>Viscosity (1000 cps/L)</b>	20	50	100
<b>Body size (mm)</b>	W97xD210xH161		
<b>Body net weight (kg)</b>	4.6		
<b>Power</b>	AC110/220V, 50/60Hz, Single Phase		



RB-Series

RM

#### RB-25/40-RM, Medium Analog, High Speed

##### Features:

- Stirring quantity maximum 20Liters(H<sub>2</sub>O).
- Small high torque motor, quiet turning.
- Chemical resistant, stainless steel chuck and stirring shaft.
- Motor over-heat protection.
- Fuse cut off automatically while the max. torque is overload.

##### Option:

- RM model equipped with analog tachometer.

##### Accessories:

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:** W400xD315xH54mm, 8kg.

**Holder**

**Pole**



Model	RB-25	RB-40
Motor	DC 60W	
Speed (rpm)	0~2500	0~4000
Torque (kg-cm)	2	1.5
Viscosity (1000 cps/L)	5	3
Body size (mm)	W165xD120xH215	
Body net weight (kg)	3.8	
Power	AC110/220V, 50/60Hz, Single Phase	



RP-30

#### RP-30, RP-30T, Medium Digital

##### Features:

- Small high torque motor, quite and vibration less in working.
- Stainless shaft and chuck.
- Digital rpm display, touching control pad. Auto-supplement of power.
- Automatic microprocessor controller.
- Digital timer (0-99 h), (59min) with an alarm buzzer.
- T Series with Digital tachometer and torque meter.

##### Accessories:

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:** W400xD315xH54mm, 8kg.

**Holder**

**Pole**



RP-30T

Model	RP-30 / RP-30T
Motor	DC 60W
Speed (rpm)	3,000
Torque (kg-cm)	1.5
Viscosity (1000 cps/L)	5
Time Settings	0~99 Hours, 59 Min
Body size (mm)	W155xD120xH215
Body net weight (kg)	4
Power	AC110/220V, 50/60Hz



RL-1500D

**RL-1500/0750/0375-D, DC Mixers**

**Features:**

- Quick reaction, constant speed, over-heat-protection.
- Digital timer control in 0-99 hours 59 min.
- Modern outlook with the easy operation.
- Stainless steel chuck and stirring shaft.
- The chuck suits to the shaft under Ø10mm.
- Stirring quantity maximum 30Liter(H2o).
- Easy height adjustment.
- Brushless DC Motor.
- Various speed & torque selections are available.
- Basic type without digital display and time setting.
- Double torque (kg-cm) display: Display with 5 sections in percentage. Also, Display with figures in digital.

**Accessories:**

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:** W400xD315xH54mm, 8kg.

**Holder**

**Pole**



RL-1500

Digital Model	RL-1500D	RL-0750D	RL-0375D
Analog Model	RL-1500	RL-0750	RL-0375
<b>Motor</b>	DC-80W		
<b>Speed (rpm)</b>	100-1500	50-750	25-375
<b>Torque (kg-cm)</b>	3	6	12
<b>Viscosity (1000 cps/L)</b>	20	50	100
<b>Time setting</b>	0~99 Hours, 59 mins		
<b>Body size (mm)</b>	W110xD229xH147		
<b>Body net weight (kg)</b>	3.7		
<b>Power</b>	AC110/220V, 50/60Hz		



RL-2000D

**RL-2000/1250-D, DC Mixers**

**Features:**

- Stirring quantity maximum 30Liter(H2o).
- Double torque (kg-cm) display: Display with 5 sections in percentage. Also, Display with figures in digital.
- Digital timer control in 0-99 hours 59 min.
- Modern outlook with the easy operation.
- Stainless steel chuck and stirring shaft.
- The chuck suits to the shaft under Ø10mm.
- Various speed & torque selections are available.
- Basic type without digital display and time setting.
- Quick reaction, constant speed, over-heat-protection.
- Easy height adjustment.
- Brushless DC Motor.

RL-2000



Digital Model	RL-2000D	RL-1250D
Analog Model	RL-2000	RL-1250
<b>Motor</b>	DC-80W	
<b>Speed (rpm)</b>	200-2000	125-1250
<b>Torque (kg-cm)</b>	2.2	3.6
<b>Viscosity (1000 cps/L)</b>	15	25
<b>Time setting</b>	0~99 Hours, 59 mins	
<b>Body size (mm)</b>	W100xD220xH180	
<b>Body net weight (kg)</b>	3.4	
<b>Power</b>	AC110/220V, 50/60Hz	



### RK-2200, LCD Digital Enhanced Overhead Mixer

#### Features:

- High reliability, long continuous service, outstanding performance
- Cover the speed range from 50 to 2200rpm, the speed is accurate and controlled
- Brushless DC motor drive, low noise and maintenance free
- Setting value and actual value can be displayed, real-time monitoring torque and speed via LCD display
- Overload protection – motor would automatically stop in case of continuous overload
- Anti-spill samples – PC control system starts up smoothly, prevent samples overflow
- Separated safety circuit – automatically cut off the circuit in abnormal conditions, make sure using security.
- Extended application – PC can control and document all operation values via RS232 interface.

Model	RK-2200
Max. stirring quantity (H <sub>2</sub> O)(L)	40
Motor rating input (w)	120
Motor rating output (w)	100
Voltage (VAC)	100-240
Frequency (Hz)	50/60
Power (W)	130
Speed range (rpm)	50-2200
Speed display accuracy (rpm)	±3
Speed display	LCD
Speed display resolution (rpm)	±1
Max. torque (Ncm)	60
Torque display	LCD
Overload protection	LED lights, motor automatic stops
Motor protect	LED lights. motor automatic stops
Viscosity max. (mPas)	50000
Chuck range diameter (mm)	0.5-13
Dimension (W x H x D) (mm)	83x220x186
Weight (kg)	2.8
Protection class acc. to DIN/EN 60529	IP42
Temperature (°C)	5-40
Permission relative humidity (%)	0
Remote control (RS232 interface)	Yes



### RO-120 Series, High Viscosity Stirrer

#### Features:

- Revolving vessel design, fits high viscosity fluid.
- Stirring shaft is in stainless steel.
- RO-120V is a vacuum stirrer and can decrease bubble during operation.

Model	RO-120	RO-120V
Capacity (L)	0.2 ~ 5	
Timer (min.)	0 ~ 60 or "NO"	
Speed (rpm)	0 ~ 120	
Dimension WxDxH (mm)	325x236x593	461x320x613
Weight (kg)	20	35
Power	AC 110/220V, 50/60Hz	





RL-3000D

**RL-3000, High Speed Mixers**

**Features:**

- Stirring quantity maximum 50Liter(H<sub>2</sub>O).
- Double torque (kg-cm) display: Display with 5 sections in percentage. Also, Display with figures in digital.
- Digital timer control in 0-99 hours 59 min.
- Modern outlook with the easy operation.
- Stainless steel chuck and stirring shaft.
- The chuck suits to the shaft under Ø10mm.
- Various speed and torque selections are available.
- Basic type without digital display and time setting.
- Easy height adjustment.
- Brushless DC Motor.



RL-3000

Digital Model	RL-3000D
Base Model	RL-3000
Motor	DC-150W
Speed (rpm)	200-3000
Torque (kg-cm)	3.5
Viscosity (1000 cps/L)	5
Time setting	0~99 Hours, 59 mins
Body size (mm)	W110xD220xH166
Body net weight (kg)	3.5
Power	AC110/220V, 50/60Hz

**Accessories:**

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 8 Ø50mm

**Stand base:** W400xD315xH54mm, 8kg.

**Holder**

**Pole**



HOD-30

**HOD-30, High Speed Mixer**

**Features:**

- Digital speed (rpm) display.
- Spring hoister for easy operation.
- Stirring shaft Ø8mm, length adjusted freely.
- Auto function of current accelerating and restraining.
- With an overheat protection and fuse safety device.
- Small motor with high torque provides quiet and vibration less operation.
- Stainless steel shaft and chuck.

**Accessories:**

**Stirring Shaft:** Ø8x500mm

**Propeller:** No. 11 Ø50mm

**Stand base:** W310xD270xH21mm, 3kg.

Model	HOD-30
Motor	DC 210W
Max. Speed (rpm)	3,000
Torque (kg-cm)	7
Viscosity (1000 cps/L)	30
Body size (mm)	W125xD265xH270
Stand Body Size (mm)	W310xD270xH690
Net weight (kg)	10
Power	AC110/220V, 50/60Hz

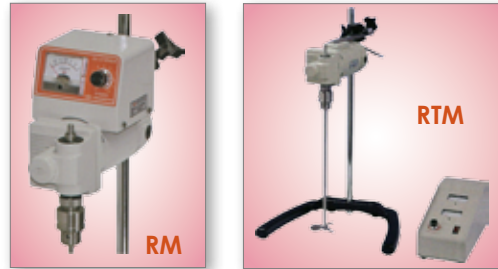


RG-03/06/12

#### RG-03/06/12 – RM/RTM, Powerful High Viscosity Mixers

##### Features:

- Stirring capacity maximum 80Liter (H<sub>2</sub>O).
- Suitable for material with high viscosity or large volume.
- Chemical resistant coating as well as stainless steel chuck and shaft.
- Small motor with high torque, quiet and vibration less during working.
- Stirring shaft can be adjusted up & down freely.
- Auto function of current accelerating and restraining.
- Overheat and overload safety device.



##### Options:

- RM type with needle tachometer.
- RTM type with needle tachometer & torque meter.

Model	RG-12	RG-06	RG-03
Motor	DC-200W		
Speed (rpm)	200 ~ 1200	100 ~ 600	50 ~ 300
Torque (kg-cm)	15	30	60
Body size (mm)	W125xD250xH250		
Net weight (kg)	6.5		
Power	AC 110/220V, 50/60Hz		



RC-350RM

#### RC-Series, High Torque DC-Mixers

##### Features:

- Auto function of current accelerating & restraining.
- Small motor with high torque provides quiet and vibration less operation.
- Over heat protection.

##### Option:

- "D" model with digital rpm meter.
- RM type with needle tachometer & Ammeter.



##### Accessories:

RC-450RM/D Shaft: Ø8x500mm

RC-200RM/D RC-350RM/D Shaft:

Max. Ø13x280mm

Propeller: No. 11 Ø50mm, Ø80mm.

Stand base: W400xD315xH54mm, 8kg.

Holder

Pole

494

Model	RC-200 RM/D	RC-350 RM/D	RC-450 RM/D
Motor	DC 200W	DC 350W	DC 450W
Speed (rpm)	4,000	7,000	4,000
Torque (kg-cm)	7	5.4	18
Net weight (kg)	17	18	25
Power	AC 110/220V, 50/60Hz		AC 220V, 50/60Hz



**HOD-302, HOD-312, Homo Disperser**

**Applications:**

Suitable for medicines, dye, textile, adhesive, cosmetic, spice, paint, fiber, and general chemicals, as well as the mixing, homogenizing, & dispersing of the other related chemical.

**Features:**

- Spring hoister for easy operation.
- Torque increase automatically with a constant speed.
- With an overheat protection and fuse safety device.
- HOD-302 with digital display speed.
- HOD-312 with digital timer (0-99 h) (59 min) speed and time display.



Model	HOD-302	HOD-312
Motor	DC 220W	
Max. Speed (rpm)	12,000	12,000
Capacity (L)	0.1 ~ 5	
Body size (mm)	W145xD285xH210	
Stand Body size (mm)	W370xD270xH500	
Net weight (kg)	10	
Power	AC 110/220V, 50/60Hz	



**HOD-402, HOM-402, Large Capacity Homo Disperser/Mixer Emulsifier**

**Applications (HOM-402):**

The emulsion mixer is to use flowing molecule to pressurize, accelerate, destroy and strike samples. Through these interaction, the sample would be dispersed and become tiny and blended. It is suitable for emulsifying food, paint and chemicals, such as dairy, juice, vinegar, fat, molasses and so on. It can good efficiency. No precipitation and separation of assure not only the emulsification quality but also phases are strong features of these models.

**Applications (HOD-402):**

Suitable using for medicines, dye, weave, adhesive, cosmetic, spice, paint, fiber, and general chemicals, drugs, as well as other using for homogenizing, and dispersing of relevant chemical materials.

**Features:**

- Digital display speed (rpm).
- Auto-acceleration and auto current restraining function.
- Small motor with high torque provides quiet and vibration free. Over heat protection.



Model	HOD-402	HOM-402
Motor	DC 350W	
Max. Speed (rpm)	7,000	
Max. Torque (kg-cm)	5.4	
Stand Body size (mm)	W399xD376xH840	
Net weight (kg)	17	18
Power	AC 110/220V, 50/60Hz	



HOM-302

### HOM-302, HOM-312, Homo Mixer Emulsifier Applications:

The emulsion mixer use flowing molecule to pressurize, accelerate, destroy and strike sample. Through these interaction, the sample would be dispersed & become tiny and blender. It is suitable for emulsifying food, paint and chemicals, such as dairy, juice, vinegar, fat, molasses and so on. It can good efficiency. No precipitation and separation of assure not only the emulsification quality but also phases are strong features of these models.

#### Features:

- Spring hoister for easy operation.
- Torque increase automatically with a constant speed.
- Overheat and fuse safety device.
- Impeller made by stainless steel SUS316 material.
- HOM-302 with digital display speed.
- HOM-312 with digital timer (0-99 h) (59 min) speed & time display.



HOM-312

Model	HOM-302	HOM-312
Motor	DC 220W	
Max. Speed (rpm)	12,000	12,000
Capacity (L)	0.1 ~ 2	
Body size (mm)	W145xD285xH210	
Stand Body size (mm)	W370xD270xH500	
Net weight (kg)	10	
Power	AC 110/220V, 50/60Hz	



HOM-010V

### HOM-010V, Vacuum Emulsion Mixer

The MRC system is a modular designed mini plant reactor system, planned and designed to simulate and optimize chemical reaction processes as well as mixing, dispersion and homogenization processes at a model scale with a maximum volume of 2000ml. The medium in the reactor vessel can be heated up to 100°C. Vacuum operation is possible up to 26 mbar.


























#### Features:


- Chemical resistant, stainless steel chuck and stirring shaft
- Small motor with high torque provides a quiet & vibration less operation.
- Stable rotational speed.
- Widely used in vacuum emulsion preparation.

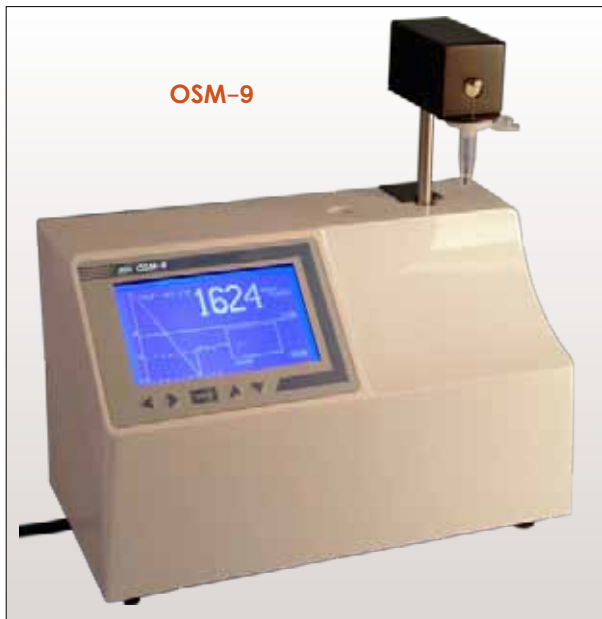


Model	HOM-010V
Mixer motor	DC 220W
Speed (rpm)	0 ~ 12,000
Stirring capacity (L)	0.1 ~ 2
Water bath temp.	RT ~ 100°C
Water bath capacity (L)	10
Heater	600W
Vacuum pump motor	250W
Pressure	-740mmHg
Pumping speed (L/min)	60
Power	AC110/220V, 50/60Hz



No.1 Paddles high shear radial flow	No.2	No.3	No.4	No.5
				
Ø 4,5,5,6,5,7,5,8,5,9,5cm	Ø 5cm	Ø 5cm	Ø 5cm	Ø 5cm
No.6 4-bladed	No.7	No.8 3-bladed	No.9	No.10 Dissolver stirrer
				
Ø 3, 7, 10cm	Ø 5cm	Ø 5cm	Ø 5, 9cm	Ø 1.5, 2.5, 4cm
Standard stirring element. For drawing the material to be mixed from the top to the bottom. Local shearing forces. Generates axial flow in the vessel. Used at medium to high speeds.	-	Flow-efficient design. For drawing the material to be mixed from the top and the bottom. Minimum shearing forces. Used at medium to high speeds.	-	Radial flow, for drawing the material to be mixed from the top and the bottom. High turbulence, high shearing forces. Particle reduction. Used at medium to high speeds.
				
No.11 Dissolver stirrer High shear dispensing	No.12	No.13 3-bladed, Axial Flow	No.14 4-bladed	No.15
				
Ø 5, 6, 8, 10, 12, 14cm	Ø 10cm	Ø 5cm	Ø 5, 7, 10cm	Ø 8, 10, 12cm
This stirrer provides radial flow for drawing the material to be mixed from the top and the bottom while creating high turbulence and high shearing forces for particle reduction. Medium to high speeds required.	Two-bladed stirrer whose blades open with increasing speed. Perfect for stirring in round vessels with narrow necks and the effect is similar to that of a 4 bladed propeller stirrer. Medium to high speeds required.	Flow-efficient design for drawing the material to be mixed from the top and the bottom while creating minimum shearing forces. This propeller stirrer is used at medium to high speeds.	Standard stirring element for drawing the material to be mixed from the top to the bottom. It creates local shearing forces and axial flow in the vessel. This propeller stirrer is used at medium to high speeds.	Flow-efficient design for drawing the material to be mixed from the top and the bottom while creating minimum shearing forces. This propeller stirrer is used at medium to high speeds.
				

No.16	No.17 Centrifugal stirrer	No.18 Anchor stirrer	No.19	No.20 Paddle stirrer
				
Ø 8, 10, 12, 16, 20cm	Ø 5cm	Ø 5, 7, 7.5, 8, 11cm	Ø 9.5cm	Ø 7cm
Flow-efficient design for drawing the material to be mixed from the top and the bottom while creating minimum shearing forces. This propeller stirrer is used at medium to high speeds.	Two-bladed, blades open with increasing speed. For stirring in round vessels with narrow necks. Effect is similar to that of a 4-bladed propeller stirrer. Medium to high speeds required.	Tangential flow, high shearing rate at edges, minimum deposits on the vessel wall. Used at low speeds. Polymer reactions, even distribution of high mineral contents in liquids. The ideal stirrer for medium to highly viscous fluids.	-	Tangential flow, minimum turbulence, good heat exchange, gentle treatment of product. Used at low to medium speeds. For applications of gentle treatment of materials.
	-		-	
No.21	No.22	No.23	No.24	No.25
				
Ø 3cm	Ø 2.5, 4cm	Ø 14cm	Ø 10cm	Ø 4cm
No.26	No.27	No.28	No.29	
				
Ø 6.5cm	Ø 7cm	Ø 6.8cm	Ø 8.5cm	
Crossed stirrer, shaft length 35cm, PTFE coated. Standard stirring element, used at medium and high speeds	Straight stirrer, shaft length 35cm, PTFE coated. Suitable for mixing of low viscosity media, used at medium and high speeds	Blade stirrer, shaft length 35cm, PTFE coated. Gentle processing samples, used at low and medium speeds	Centrifugal stirrer, shaft length 35cm, PTFE coated. Blades open with increasing speed for stirring in a round vessel with a narrow neck, used at medium and high speeds	



**OSM-9, Osmometer**

The OSM-9 is a compact micro processor controlled analyzer for easy and precise osmolality tests in samples of serum, plasma, urine or other body fluids.

**OSM-9 model has hi-tech user interface:**

- Observation of the sample freezing process with immediate information regards result correctness.
- Available measurement results history with printout of the single result or of many chosen measurement results.
- Active result printout description.
- Service panel with service tests.
- Displaying in Polish/English/German/French.
- Date and time setting.
- The microprocessor control and built in electronic components with high long term stability make the OSM-9 an analyzer of easy application & reliable results.

**Whole blood, plasma or serum (Sosm):**

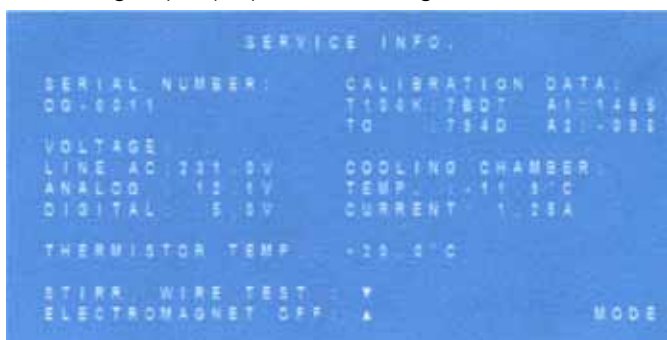
- Monitor hypo and hypernatremic states.
- Monitor effectiveness of fluid therapy such as 5% dextrose solutions.
- Detect and monitor over hydration and dehydration.
- Diagnose and monitor diabetics, especially diabetichyperosmolal non-ketonic coma (DHNC).
- Lactic-acid monitoring in shock-trauma patients.
- Reaffirm BUN, glucose and electrolyte value.

**Urine:**

- Detection of the onset of acute renal disease.
- Monitor antidiuretic hormone (ADH) activity.
- Monitor effectiveness of diuretic therapy especially Mannitol.
- Monitor polyuric states.
- Detect diabetes insipidus.



Simple operation: The OSM-9 makes the running of the osmolality test very easy. 100µl of the sample are Pipette into a sample tube. The sample tube is attached to the measuring head. The measuring head is pushed down into the cooling chamber. Now the measuring cycle starts automatically. When the measuring is terminated, the measuring head returns to its upper position again, and the result is digitally displayed in mOsm/kgH2O.



- 1-point calibration - the 1-point-calibration requires distilled water only, and is one of the most practical features of this analyzer. The calibration values are automatically calculated and stored in the microprocessor memory.
- Automatic work - the OSM-9 needs only a sample.
- The microprocessor control and built in electronic components with high long term stability.
- Ready to work - ca. 5 min; short measuring time - 1.5 min
- High precision ( $\pm 0,5\%$ ) and reproducibility (better then 0.5%) results.
- Disposable tubes do not require clearing and sterilization.
- Low operating cost.

Model	OSM-9
<b>1-point calibration</b>	0 mOsm/kgH2O
<b>Cooling</b>	thermoelectric (Peltier effect)
<b>Sample volume</b>	100 µl
<b>Measuring range</b>	0-2000 mOsm/kgH2O
<b>Resolution</b>	1 mOsm/kgH2O
<b>Precision</b>	$\pm 0.5\%$
<b>Reproducibility</b>	better then 0.5%
<b>Dimensions</b>	300x200x170mm
<b>weight</b>	6.25kg



OSM-8

**Whole blood, plasma or serum (Sosm):**

- Monitor hypo and hypernatremic states.
- Monitor effectiveness of fluid therapy such as 5% dextrose solutions.
- Detect and monitor over hydration and dehydration.
- Diagnose and monitor diabetics, especially diabetichyperosmolal non-ketonic coma (DHNC).
- Lactic-acid monitoring in shock-trauma patients.
- Reaffirm BUN, glucose and electrolyte value.

**Urine:**

- Detection of the onset of acute renal disease.
- Monitor antidiuretic hormone (ADH) activity.
- Monitor effectiveness of diuretic therapy especially Mannitol.
- Monitor polyuric states.
- Detect diabetes insipidus.

**OSM-8, Osmometer**

The freezing-point microprocessor-controlled one-point calibration instrument featuring a fully automated measuring process determining the osmolality of body fluids such as urine, serum and other biological fluids.

Unique one point calibration using distilled water, saves time and expenses.

Automatic error identification and automatic function control are outstanding features of this instrument.

**Features:**

- Easy sample handling in 1.5ml tubes.
- Bench space saving design.
- One-point-calibration.
- Automatic measuring procedure with error detection.
- The sample is cooled to below its freezing point by means of an air-cooled thermoelectric Peltier cascade.
- Series communication for printer RS232.
- The measuring result is displayed in digital form to four places in mOsm/kg H<sub>2</sub>O.
- Sample volume 100µl, measuring time 90 sec.
- Measuring range 0 to 2000 mOsm/kg H<sub>2</sub>O, standard deviation ±1%.

Model	OSM-8
sample volume	0.1 ml
measuring range	0-2000 mOsm/kgH <sub>2</sub> O
accuracy	±1 mOsm/kgH <sub>2</sub> O ±0.4%
precision	±1 mOsm/kgH <sub>2</sub> O ±0.4%
stability	2 mOsm/kg H <sub>2</sub> O/8h
measuring time	ca. 90s
dimensions	300x200x170mm
weight	6.25kg

The instrument is easy to be operate. After being placed into the measuring vessel the sample of biological fluid is pushed onto the thermistor. By pressing down the measuring head the fluid sample is introduced into the cooling section. The sample is than continuously cooled down (Peltier-effect) below its freezing point. At defined supercooling temperature the crystallization process is initiated by the stirrer. The liberated heat of crystallization causes rising the temperature of ice-liquid mixture.

The max temperature value depends on the sample osmolality. The temperature is detected and after calculations the result is displayed directly in mOsm/kgH<sub>2</sub>O.

**Accessories:**

150-1-000010	Sample tubes 1box=1000pcs
150-1-000011	Standard Solution 400mOsm/KgH <sub>2</sub> O
150-1-000012	Standard Solution 800mOsm/KgH <sub>2</sub> O
150-1-000013	Standard Solution 1600mOsm/KgH <sub>2</sub> O
150-1-000014	Standard Solution 0mOsm/KgH <sub>2</sub> O



DNO-Series

### DNO-D Series, Drying Oven With Natural Convection

Routine drying & sterilization applications up to 200°C and storage at precisely controlled elevated temperature are the strengths of DNO drying ovens.

- **Hot air ovens** are suitable for various applications in the fields of agricultural, and industrial researches for heating, drying, sterilizing and baking in laboratories, hospitals, and industries.
- **PID temperature control** provides automatic compensation after load changes, setting changes or door opening for excellent accuracy.

- **Natural convection** heat distribution combines with adjustable air vents to provide excellent uniformity.
- **Double wall** construction, **fiberglass** insulation and **silicon rubber** door sealing reduce heat loss and power drain.
- **Stainless steel interior** chamber and shelves are corrosion resistant, durable & easy to clean.
- **Power coating exterior** is beautiful, durable, and corrosion resistant.

#### Features:

- Simple keypad input allows easy temperature setting.
- LED digital display enable users to monitor the chamber temperature at any given time.
- Visual alarm indicator alerts users of abnormal conditions if the chamber temperature exceeds the setting point by 10°C.
- The temperature can be controlled and maintained to 200°C.
- Ovens feature a see-through window to view contents without opening.
- Adjustable shelves are included.
- The temperature stability is  $\pm 0.5^\circ\text{C}$  at 100°C;  $\pm 1.0^\circ\text{C}$  at 200°C.
- Optional cable port.
- Optional gas inlet.
- Optional forced air.



DNO-300

#### Specifications:

Model	DNO-20	DNO-30	DNO-50	DNO-80	DNO-150	DNO-300
<b>Convection</b>	Natural convection					
<b>Working temperature</b>	Ambient +5°C ~ 200°C					
<b>Capacity (Liters)</b>	20	30	50	80	150	300
<b>Chamber DIM.(mm)</b>	W300xD310xH230	W325xD310xH315	W380xD365xH390	W420xD450xH463	W625xD510xH500	W625xD510xH1000
<b>Power watts</b>	500	700	1000	1200	1400	2000
<b>Dimensions (mm)</b>	W412xD420xH500	W425xD420xH610	W480xD475xH695	W522xD560xH770	W725xD620xH795	W725xD620xH1465
<b>Accessory</b>	2 Shelves					4 Shelves
<b>Optional accessory</b>	Test tube basket					
<b>Power supply</b>	AC110V 60Hz or 220V 50/60Hz					



PN30

**PN-Series, PEAK Natural Convection General Purpose Laboratory**

Ovens with high specification. Suitable for general laboratory heating & drying applications yet with the versatility & optional accessories for more complex and demanding applications. Natural gravity convection offers greater economy and more gentle airflow within the chamber.

**Options:**

- Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation).
- Hydraulic over-temperature thermostat.
- MRC 301, PID controller with simple ramp to set-point function.
- Digital countdown timer to switch oven off.
- Top access port for independent thermocouple.
- Accessory shelves & runners.
- Cable access port.
- Viewing window door\*.
- Through door illumination system\*.
- Stacking frame.
- Key-lock door.
- Door switch.
- Floor stands and wheeled trolleys.
- Routine spares kit.

**Features:**

- Economical natural convection models
- 300°C maximum operating temp.
- 27 to 215 Liters chamber volumes.
- TLK simple PID controller.
- Chemically resistant stainless steel liner.
- Two nickel-chrome plated wire shelves
- Lever latch door & airtight silicone seal.
- Compliant with safety standards BS EN 61010-2-010-1995 & BS EN 50014:1993.
- Meets "Electrically Heated Drying Oven" performance standard BS 2648.



PN200



PN30

Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Temp. stability °C PID	Temp. uniformity 300°C (±°C)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ accepted	Shelf loading Each/ total (kg)	Vol. (Liters)	Max. Power (W)		Weight (kg)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)				Holding Power max W			
PN30	300	52	±0.5	7.0	8.5	255x330x320	470x665x470	2/3	10 20	27	750 300	30	230V single phase	
PN60	300	52	±0.5	7.0	8.5	350x392x420	570x765x570	2/5	10 30	57	1000 480	45		
PN120	300	52	±0.5	7.0	8.5	450x492x520	670x865x670	2/9	10 40	115	1500 720	60		
PN200	300	58	±0.5	7.0	10	700x592x520	920x965x670	2/15	10 50	215	2250 1160	75		

Minimum operating temperature approximately ambient plus 10°C. Uniformity is measured in an empty chamber with vents closed, after a stabilization period. Shelf loadings are based on evenly distributed weight.



### DFO-Series, 36 Liter, 80 Liter, 150 Liter, 240 Liter Ovens

DFO Series units are primarily used in applications needing rapid drying and sterilization. Totally homogenous temperature distribution and/or rapid dynamic response. This modern range of ovens is available in 4 sizes.

DFO Series offers excellent uniformity and stability & are used for many applications as Glassware drying, warming, sterilizing, ageing, curing, softening, annealing, preheating and testing, drying slides. The inner case is constructed from polished stainless steel.

All units are provided with wire plated shelves with multi-position settings.

All models are with fan assisted air circulation, the chamber ventilation and exhaust vent are easily adjustable.

Wide choice of control options is available, PID controller & timer is fitted as standard with dual display of measured value and setpoint.

#### Options:

- 38 mm cable port
- Gas inlet
- 5 programs of 8 segments model: 3216CP
- 4 programs of 16 segments model: 2416P4
- RS-232 / 485 communication model: 3216E



DFO-36

#### Specifications:

Model	DFO-36	DFO-80	DFO-150	DFO-240
Temp. range	Room temperature - 250°C			
Temp. constancy	±0.1°C			
Temp. uniformity	±2%			
Temp. control	PID			
Temp. sensor	Thermocouple K			
Heater: Oven	1100W	1500W	1800W	2200W
Inside Material	S.S-430			
Timer	99hr 59min			
Window (mm)	W200xH300			W200xH500
Safety devices	Short circuit breaker, over heat protector, sensor abnormality			
Inside dimensions (mm)	W400xD300xH300	W500xD400xH400	W600xD500xH500	W600xD500xH800
Outside dimensions (mm)	W525xD420xH595	W620xD520xH620	W720xD620xH720	W720xD620xH1020
Capacity (Liters)	36	80	150	240
Shelves	2			3
Weight	34kg	47kg	60kg	76kg



### DFO-N Series, 50 Liter, 70 Liter, 140 Liter, 240 Liter Ovens

Precise hot-air drying ovens, sterilizing in one unit. Micro-processor based temperature controller and zero hysteresis infrared wire heater for stability up to  $\pm 0.1^\circ\text{C}$ . Silent hot conditioned axial fan and the unique design of air circulation for uniformity. Patented ventilator featured with safe & easy access for exhausting of damp and fume, fast cool-down and ultra-low intrinsic temperature close to ambient. Available with power-on modes of standby and auto restart after power failure for additional reliable and uninterrupted operation. Bright cool white temperature screen, easy access symbolic key icon and status display. Hair-style polished stainless steel interior and rounded corner bottom for easy cleaning and long service life. Adjustable shelves for more space & different heights.

#### Applications:

Applicable to drying, burning, sterilizing and aging in fields of medical Is & pharmaceuticals, life science, agriculture, food industries and, electric and electronics



#### Specifications:

Model	DFO-50N	DFO-70N	DFO-140N	DFO-240N
Temp. range	Room temperature $5^\circ\text{C}$ ~ $260^\circ\text{C}$			
Temp. constancy	$\pm 0.1^\circ\text{C}$ ~ $0.3^\circ\text{C}$			
Temp. uniformity	$\pm 1.5$ ~ $2.0\%$			
Temp. control	PID			
Heater: Oven	950W		1500W	2100W
Inside Material	SUS-304, hair style polishing			
Timer	Auto start-up, Auto shut-up			
Safety devices	Protection and warning against short-open-circuit of temperature sensor High-temperature cutout and low-temperature alarm Independent over temperature cutout (STB), RCD ATC (Absolute Temperature Calibration), Auto start-up or standby after power fail ure			
Inside dimensions (mm)	W400xD400xH320	W440xD400xH400	W550xD550xH460	W640xD610xH610
Outside dimensions (mm)	W510xD550xH698	W550xD550xH778	W660xD705xH858	W750xD765xH1008
Capacity (Liters)	50	70	140	240
Shelves/Maximum	2/3	2/4	2/5	3/7
Power input	220-240V~, 50/60Hz, 100V- 50/60Hz, 120V-160Hz			
Net Weight	58kg	65kg	83kg	116kg





AX60

**AX-Series, APEX Ovens 250°C**

An uncomplicated economical range of ovens, built to MRC's high standards, with safe external surface temperatures that conform to BSEN61010.

**Features:**

- 250°C maximum operating temperature.
- 30, 60 or 120 Liters chamber volumes.
- Fan convected for rapid heating & excellent uniformity.
- Chemically resistant stainless steel liner.
- Two adjustable nickel-chrome plated wire shelves.
- Lever latch door & airtight silicone seal.
- Built to comply with BS EN 61010-2-010-1995 & BS EN 50014:1993.
- Meets "Electrically Heated Drying Oven" performance standard BS 2648.

**Options:**

- Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents and for unattended operation).
- Digital countdown timer to switch oven off.
- Additional sets of shelves & runners.
- Key-lock door.
- Low voltage options for use below 220V.
- Routine spares kit.



Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Temp. uniformity 250°C (±°C)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ Accepted	Vol. (Liters)	Air changes /hr	Max. Power (W) Holding Power max W	Weight (kg)	Power Supply
					Internal HxWxD(mm)	External HxWxD(mm)						
AX30	250	23	±5.0	3	295x300x320	440x590x465	2/4	28	65	1000 320	24	230V single phase
AX60	250	25	±5.0	3	395x400x420	540x690x565	2/6	66	28	1500 475	37	
AX120	250	26	±5.0	3	495x500x520	640x790x665	2/8	128	14	2000 650	55	

Minimum operating temperature approximately ambient plus 10°C. Uniformity is measured in an empty chamber with vents closed, after a stabilization period. Shelf loadings are based on evenly distributed weight.



LHT 58/350

**LHT 58/350, Chamber Ovens up to 350°C**

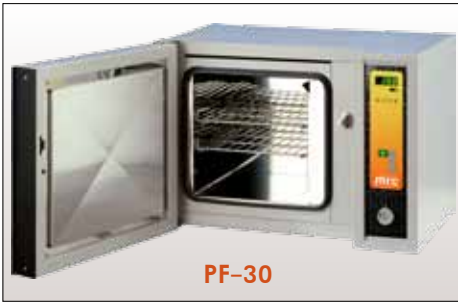
Economical low temperature electric ovens that are intended for the thermal processing of various materials and parts up to a temperature of 350°C. The products can be used in scientific laboratories, educational institutions, medicine, and industry, Forced air circulation assures an even temperature distribution throughout the chamber, and high quality thermal processing occurs quickly.

**Basic model:**

- Forced air circulation
- Regulated air intake and extraction
- Chamber made of regular or stainless steel
- Hermetically closed doors
- Microprocessor-controlled thermoregulator
- Includes standard shelves
- High-quality, ecological thermal insulation material
- Low electric power usage
- Short heating up/Cooling down period
- High degree of accuracy
- Exterior painted with powder coating (RAL 7035)
- Up to a 24 month guaranty period.

Model	Vol. l	T max. °C	Chamber DIM. (mm)			Overall DIM. (mm)			Power (kW)	Voltage (V)	Weight (Kg)	Air Flow	Number of shelves		Chamber Material	
			Width	Length	Height	Width	Length	Height					Sets	Max.	Stainless steel	Mild steel
LHT 58/350	58	350	390	380	360	685	675	615	2	230	40	•	3	7	•	○

PF-Series, 300°C Ovens



This modern range of ovens provides a combination of excellent performance & reliability. Increased power and low thermal mass encased fibre insulation ensure both fast heat up times & reduced recovery times. Reduced holding power once at set temp., together with the insulation, makes the range economical & outer case temperatures have been significantly reduced. Both gravity & forced air circulation models are available with a wide choice of control options allowing the most critical performance criteria to be met. Where processes involve the liberation of flammable VAPORS, a stoving & curing option is available. Also, where processes involve large amounts of water, a moisture extraction option is available.

**Features:** The outer cases are fabricated from corrosion resistant zinc coated mild steel & finished in two tone hard wearing stoved epoxy/polyester coating. The inner case is constructed from polished stainless steel. All units are provided with non-tilt bright nickel wire plated shelves with multi-position settings for convenient loading & unloading.

**Adjustable air ventilation**

The chamber ventilation and exhaust vent are easily adjustable from the front control panel, on all bench top models.

**Digital temperature control**

The control module is able to house many variations of digital instrumentation with simultaneous display of measured and set temperature. Microprocessor based PID controllers are fitted as standard.

**Economy and efficiency**

Insulation around the oven chamber utilizes totally encased fibre material. This material has a very low thermal mass and thermal conductivity, ensuring very efficient insulation. This also ensures reduced holding power, making the units economical to operate once set temperature has been reached.

**Door action**

A flush fitting door latch with a concealed mechanism is both simple to use & provides a handle when unlatched. The lever action ensures gentle closure. The door seal design includes a newly formulated silicone compound, providing longer life & durability at maximum temp. The design also allows convenient replacement if necessary.

**Control panel**

The side mounted control panel avoids damage from accidental spillage.

**Safety standards**

All units meet the relevant European health and safety at work legislation & the performance criteria of BS 2648 & DIN 50-011. They are manufactured to comply with BS EN 61010: safety standard & also the low voltage & EMC European Directives.

**Options:**

- Range of over temp. protection systems in accordance with DIN12-880 Part 2.
- Stoving & curing option available for processes involving liberation of flammable vapors.
- Timers: Process timers-manual or automatic. Mechanical or electronic time switches.
- Top access port for independent probe.
- Lockable door latch.
- Exhaust fan \*
- Variable speed fan \*
- Inert gas connection \*
- Flow meter & needle valve.
- Viewing window in door \*
- Interior light.
- Air inlet filter.
- Cable entry port \*
- Door switch.
- Stands & trolleys.
- Chart recorders.

Model	PF30	PF60	PF120	PF200
<b>Max. Temp (°C)</b>	300	300	300	300
<b>Chamber Dimensions (mm)</b>	(H) 300 (W) 292 (D) 320	400 392 420	500 492 520	750 592 520
<b>Outside Dimensions (mm)</b>	(H) 470 (W) 665 (D) 470	570 765 570	670 865 670	920 965 670
<b>Chamber Capacity (Liters)</b>	28	66	128	230
<b>Weight (kg)</b>	30	45	60	75
<b>Shelves</b>				
<b>Number Supplied</b>	2	2	2	2
<b>Max. Possible</b>	3	5	9	15
<b>Max. Dist load/shelf kg</b>	10	10	10	10
<b>Max load kg</b>	20	30	40	50
<b>Performance</b>				
<b>Power Rating at 240V (watts)</b>	1000	1500	2000	2700
<b>Holding Power* at Max. temp. (watts)</b>	350	600	800	1250
<b>Temp. Uniformity* (at Max. temp. as a%)</b>	±1.0	±1.0	±1.0	±1.0
<b>Temp. Stability on/off control (°C)</b>	±1.0	±1.0	±1.0	±1.0
<b>Temp. Stability PID control (°C)</b>	±2.0	±2.0	±2.0	±2.0
<b>Heat up Times* 100°C (Mins)</b>	4.5	4.5	4.5	5.5
<b>200°C</b>	12	12	12	14
<b>240V 300°C</b>	25	25	25	30
<b>Recovery Times* 100°C (Mins)</b>	1	1	1	1.5
<b>200°C</b>	2.5	2.5	2.5	3
<b>Door Open 60sec 300°C 240V</b>	4	4	4	5
<b>Air Exchanges vol (l/h) @ 100°C</b>	1400	1400	1400	1400
<b>Air Exchanges</b>	50	21	11	6

\* These options may affect Chamber Uniformity

Note: A uniformity of ±1%=±1°C at 100°C

\*With vents closed.

**HF4-2, Horizontal Air Flow Ovens 300°C**



HF4-2

MRC High Performance Ovens are engineered to meet the most critical temperature requirements. They are designed for continuous drying operations at temperatures up to 300°C. Factory-set over temperature protection prevents control failure from damaging contents and guards against burnout. The Watlow controller provides a 24-step ramp and soak, 0.1°C control, multiple levels of operator access and automatic resumption of program following a power failure. Time and temperature are displayed in a three-digit LED readout for fast and accurate setting. In addition, the sealed membrane touch-pad control panel is water and acid resistant. Horizontal air flow provides fast heat-up and recovery & ensures rapid drying. Heated air is continuously circulated by twin turbo blowers.

Blowers also circulate air to motor bearings to prolong motor life. Punched stainless steel shelves are adjustable on 1/2 inch centers. Adjustable three air intake and exhaust ports can be opened for fast drying of high-moisture content samples. The 3.5 inch thick wrap-around fiberglass insulation on all sides minimizes heat loss.

A high temperature gasket door seal eliminates air leakage and ensures longer gasket life while being subjected to extreme operational temperatures. This unit includes long-lasting, low-watt density heating elements. It also has adjustable heavy-duty hinges & a door latch that are designed for lifetime service.

The HF4 has rugged, welded construction with a double-walled, corrosion-resistant type 304 stainless steel interior and a powder-coated exterior.

Model	HF4-2
Capacity (Liters)	139
Interior dimension (cm)	W52xD52.7xH50.8
Exterior dimension (cm)	W88.9xD77.5xH95.3
Temperature range	15°C above ambient to 300°C
Temperature uniformity	±1.0°C at 110°C
Electrical specifications	Volts: 220V Hz:50/60 Watts: 2200 Amps: 12
Temperature recovery time	4 min to reach 110°C
Heat-up (min)	10 min to 110°C (20 min to 180°C)
Shelves	2 Supplied (8 maximum)

**CE3F-2 & CE5F-2, Horizontal Air Flow Ovens 300°C**

The CE Oven Series incorporates the Sure Load shelf system, triple wall construction, and easy-to-read microprocessor controls. Users can adjust the air exhaust from the chamber without being near the the heat source. Even at operating temperatures of 225°C, the outer skin of this unit meets all CE requirements, so workspace remain cool.



CE3F-2

The 99 hr 59 min digital timer has an independent control, so its use is optional. Once the timer expires, the heating elements turn off while the blower continues running to cool the samples inside the oven. Whatever the application, these forced air ovens deliver precise uniformity, air distribution and the peace of mind expected from the MRC brand. All of the MRC CE Series ovens are CE approved. The CE family is our latest installment of a product of Constant.

Model	CE3F-2	CE5F-2
Capacity (Liters)	86	139
Inside DIM.(mm)	W419xD489xH419	W533xD489xH534
Outside DIM.(mm)	W660xD686xH90.2	W775xD699xH1016
Temperature Range	15°C above ambient to 230°C	15°C above ambient to 225°C
Temp. Uniformity	±2.0°C at 150°C	±2.5°C at 150°C
Electrical Spec.	Volts: 220V Hertz: 50/60 Hz Watts: 1100 Amps: 5	Volts: 220V Hertz: 50/60 Hz Watts: 1500 Amps: 6.5
Temp. Recovery Time	5 minutes at 150°C	8 minutes at 150°C
Heat-up (min)	36 minutes at 150°C	30 minutes at 150°C
Shelving	2 Supplied (8 Maximum)	

**Features:**

- Microprocessor Controls
- Horizontal Air Flow
- Cool Touch Damper
- Digital Timer to 99 hr and 59 min.



FD 200/200



FD 20/300

FD 420/300

### FD 200/200, Chamber Ovens up to 200°C

Economical low temperature electric ovens that are intended for the thermal processing of various materials and parts up to a temperature of 200°C. The products can be used in scientific laboratories, educational institutions, medicine, and industry. Optional forced air circulation assures an even temperature distribution throughout the chamber, and high quality thermal processing occurs quickly.

#### Basic model:

- Chamber made of mild steel or stainless steel
- Forced air circulation
- Hermetically sealed doors
- Microprocessor temperature controller
- Includes standard shelves
- High-quality, ecological thermal insulation material
- Low electric power usage for increased energy efficiency
- Short heating up/cooling down period
- High degree of accuracy
- Exterior painted with powder coating (RAL 7035)
- 1 year guaranty on furnace, 2 years controller.

### FD 420/300, Chamber Ovens up to 300°C

A new range of laboratory ovens that are intended for the thermal processing of materials up to a temperature of 300°C. Used for such processes as drying, heating, thermal testing, and aging in an air environment. Forced air circulation allows a homogenous temperature distribution to be achieved during all processes, which ensures optimal results.

#### Basic model:

- Forced horizontal air circulation
- Valve control of air extraction (operated via front panel)
- Chamber made of stainless steel
- Hermetically closed doors
- Microprocessor-controlled thermoregulator
- End of programme audible signal
- Protection against overheating
- Fan revolution controller
- Includes standard shelves
- High-quality, ecological thermal insulation material
- Low electric power usage
- Short heating up/cooling down period
- High degree of accuracy
- Exterior painted with powder coating (RAL 1015 & RAL 1017)
- Up to a 24 month guaranty period.

Model	Vol. l	T max. °C	Chamber DIM. (mm)			Overall DIM. (mm)			Power (kW)	Voltage (V)	Weight (Kg)	Air Flow	Number of shelves		Chamber Material	
			Width	Length	Height	Width	Length	Height					Sets	Max.	Stainless steel	Mild steel
FD200/200	200	200	710	610	460	1040	780	775	2	230	77	●	2	5	●	○
FD20/300	20	300	240	280	340	460	680	640	1	230	34	●	2	5	●	○
FD60/300	60	300	380	380	420	600	760	720	2	230	50	●	3	7	●	○
FD120/300	120	300	550	400	580	750	780	880	2.2	230	70	●	3	7	●	○
FD220/300	220	300	730	500	620	930	880	915	4	230	102	●	3	7	●	○
FD420/300	420	300	1000	500	860	1200	930	1200	6.2	400	155	●	3	7	●	○

**FD-600P, 200°C Large Capacity Oven****FD-600P****Features:**

- Forced-air convection and three dimensional heating system ensure air circulation and dispersion.
- PID Microprocessor controller with 9 segments and 18 steps, only on 200°C models.
- Large LCD display.
- Optimized sample monitoring with threefold tempered safety glass window.
- Electropolished stainless steel inner chambers and round corners for easy cleaning and better air flowing.
- Safe protections: over-temperature limit protection, 2 separate over-current fuses, protection over electric leakage
- Extensive alarm system for power cut, sensor failure, high and low temperature.
- Automatic running recovery after a power interruption.
- Heat resistant gasket minimizes heat loss and tightly seals the chamber door.
- Adjustable electropolished stainless steel shelving provides air flow around samples for uniformed tempering and allow for easy cleaning.
- 2 shelves included as standard.

The FD-600P forced air drying ovens is engineered for aging, bonding, curing, heat treating annealing, stress relieving, burn-in, hardening and/or test purposes, and also perfectly suited for routing drying and sterilization applications up to 200°C.

FD-600P designed to provide accurate temperature uniformity, with minimized temperature overshoot. The oven can be programmed to run up to 9 different programs with 18 steps of temperatures and time segments.

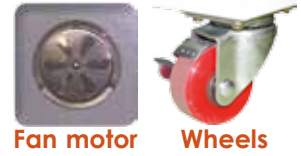
**Specifications:**

Model	FD-600P
<b>Heating mode</b>	Bottom Heating
<b>Programmable control (9 Segment/18 steps)</b>	Standard
<b>Temperature range (°C)</b>	Ambient +5~200
<b>Temperature accuracy (°C)</b>	0.1
<b>Temperature uniformity (%)</b>	≤±2.5 (200°C)
<b>Alarm</b>	Enabled
<b>Settings</b>	Digital
<b>Display</b>	LCD
<b>Volume (L)</b>	600
<b>Shelve size (mm) (WxD)</b>	725 × 789
<b>Shelve</b>	2 (Maximum 5)
<b>Chamber dimensions (mm)</b>	W800xD780xH1000
<b>Outside dimension (mm)</b>	W990xD910xH1470
<b>Packing dimension (mm)</b>	W1110xD1030xH1640
<b>Net/Gross Weight (kg)</b>	210/255
<b>Power (W)</b>	3700
<b>Voltage</b>	220/240 Volt 50/60 Hz
<b>Approval</b>	CE, ISO



**DFO-600/720/1008/2160, Large Force Convection, Double Door**

- Ovens are used for many applications as baking, drying, conditioning, sterilizing, electroplate, plastic, chemical industry, printing, hard ware, pharmacy, tea fired, bake industry .... etc
- Inner case is SUS 304 and outside body is powder painting.
- Tempered Safety Glass Window to see inside without door opening
- Install double over temperature protection.
- All models are with fan assisted air circulation, air vent on both side t
- Brake wheels, easy to move
- Silent fan motor.



Model	DFO-600	DFO-720	DFO-1008	DFO-2160
Temp. range	40°C~200°C (250°C)			
Temp. Accuracy	±0.1°C			
Temp. control / Display	PID / LED			
Temp. Sensor	Thermocouple K type			
Keep Warm	Mineral wool/Glass wool			
Safety Device	EGO (Double over temperature protection)			
Volume	600L	720L	1008L	2160L
Timer	99 h / 59 min			
Shelf (Adjustable)	4			
Power Voltage	220V 50/60Hz 1PH		220V 50/60Hz 3PH	
Inside dimensions (mm)	W1000xD600xH1000	W1200xD600xH1000	W1400xD600xH1200	W1800xD1000xH1200
Outside dimensions (mm)	W1250xD750xH1580	W1450xD750xH1580	W1650xD750xH1820	W2000xD1200xH1980



**DFO-270/480, Large Force Convection, Single Door**

- Ideal for Large Volume Baking Electronic Parts, Drying, Conditioning and Sterilizing
- Inner case is SUS 304 and outside body is powder painting.
- Tempered Safety Glass Window to see inside without door opening
- Install double over temperature protection.
- All models are with fan assisted air circulation, air vent on both side t
- Brake wheels easy to move.



Model	DFO-270	DFO-480
Temp. range	Ambient + 5°C~210°C (250°C)	
Temp. Accuracy	±1°C	
Temp. control / Display	PID / LED digital display	
Temp. Sensor	K type	
Heater	4000 W	
Volume	270L	480L
Timer	99 h / 59 min	
Keep Warm	Rock wool fiber	
Shelf (Adjustable)	4	
Power Voltage	220V 50/60Hz 1PH	
Inside dimensions (mm)	W600xD500xH900	W800xD600xH1000
Outside dimensions (mm)	W780xD620xH1520	W980xD720xH1620

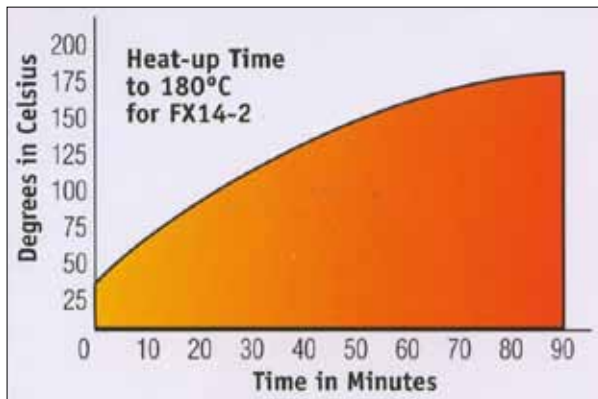
FX14-2/FX28-2, Forced Air Horizontal Flow 200°C Ovens



Large Capacity Ovens. Models FX14-2 features 385 Liter and FX28-2 793 Liter are perfect for high volume sample processing and drying applications including production processes. Precise Temperature Control: Technology. The independent over temperature protection (DTP) control is user adjustable and provides added security against temperature overshoot. Include a precision microprocessor controller, 99 hr./59 min. electronic timer and true forced air horizontal airflow. 90mm of insulation, wrapped in 2 layers. A chamber door gasket eliminates heated air leakage. The door hinges are user adjustable to maintain a positive seal over the life of the oven. True Horizontal Airflow. The blower-assisted airflow design facilitates temperature uniformity and fast recovery. A turbo blower and heavy-duty motor combine to direct heated air over the shelves and samples for even, constant drying, curing and baking.

Applications:

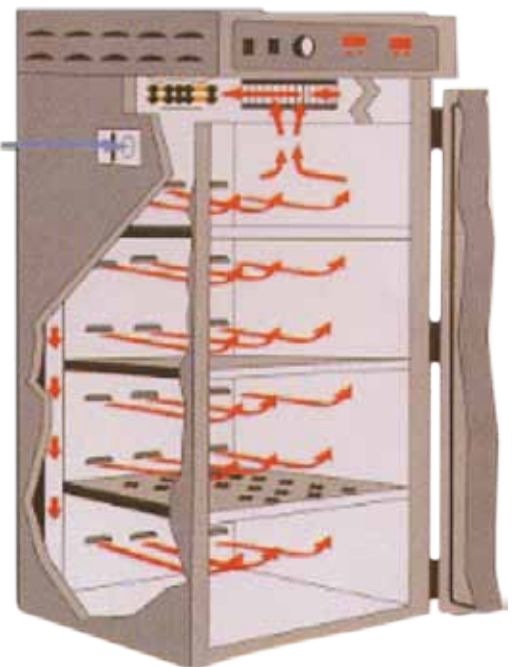
- Batch Testing
- Sterilizing
- Electronic Burn-in
- Aging Tests
- Glassware Drying
- Stability Testing.



Specifications:

Model	FX14-2*	FX28-2*
<b>System type</b>	Mechanical convection	Mechanical convection
<b>Controls/Display</b>	Single setpoint mProc.	Single setpoint mProc.
<b>Chamber capacity (Liters)</b>	387	781
<b>Temperature Recovery</b>	8min at 150°C	10min at 150°C
<b>Heat-up Time</b>	24min at 150°C	35min at 150°C
<b>High limit control</b>	Yes	Yes
<b>External dimensions (mm)</b>	W927xD876xH1207	W953xD889xH1988
<b>Internal dimensions (mm)</b>	W781xD62.8xH787	W781xD635xH1574
<b>Shelves supplied</b>	3 Shelves	6 Shelves
<b>Maximum shelves</b>	8 Shelves	16 Shelves
<b>Shipping weight (kg)</b>	154	204
<b>Element wattage</b>	2000	4000
<b>Electrical requirements</b>		
<b>Max. amp draw at 220Vac</b>	10	19
<b>Power frequency/phase</b>	50-60Hz/single phase	50-60Hz/single phase

\* - 2 Denotes 220V



FX28-2 AirFlow Diagram

Features:

- True horizontal airflow provides excellent uniformity and faster heat-up
- Microprocessor control for precise temperature control
- Independent Safety Controller
- 99 hr/59 min Electronic Timer automatically turns off at selected time
- Adjustable exhaust port controls the rate of drying.



**PF-SC Series, 300°C Ovens For Solvents**

Most vapor explosions in ovens occur when materials that can absorb large quantities of solvent are being processed; typical examples being coils & similar electrical equipment, fibre board & textiles. Every flammable solvent has a lower & upper flammable limit, & unless the concentration of the solvent VAPOR is within this range it will not explode. The range widens, for most solvents, with increasing temp. Precautions must be taken to ensure that no substantial volume of vapor/air mixture within the range of flammability can occur in the oven. It is not sufficient to permit an explosive mixture to form and attempt to obtain safety by preventing foreseeable means of ignition. The precautions must be directed towards keeping the concentration of solvent VAPOR down and this is achieved by permitting only the minimum quantity of solvent to enter the oven and by ventilating the oven continuously in use, to dilute the solvent VAPORS emitted to one quarter of the lower flammable limit. The "flash-point" of a substance is the temperature at which it evolves sufficient VAPOR to form an ignitable mixture with air when tested under standard conditions. Thus, if the flash point of a liquid is below the temperature of the work room it will give off VAPOR until (and beyond) the point where the whole room is full of a flammable mixture, or until all the liquid has evaporated. If the flash point is

higher than room temperature, then the liquid will never give off enough VAPOR to form a flammable mixture in the room. Low flash point solvents are thus intrinsically dangerous. However, the choice of a solvent with a high flash point will usually make no difference to the safety of the oven used to evaporate it, since the oven almost inevitably has a working temperature higher than the flash point. It is still most desirable to choose solvents with the highest possible flash points to reduce danger at the dipping, spraying and other processes prior to the oven.

**Pre-Treatment:** The first step should be to limit as far as possible the amount of solvent entering the oven at each loading. Particular care is needed with articles which have been dipped in paint or varnish to give a thicker coating than is usually obtained by spraying. As much drying as possible should be carried out before the articles are added into the oven. Where the process permits, it is a good practice, both for safety and economy of heat, to allow the load to remain for a short time in a semi-enclosure provided with mechanical exhaust ventilation, so that air at room temperature can remove some of the solvent. This arrangement also has the advantage that dripping in the oven is reduced, whereby the accumulation of paint and varnish residues in the oven became less of a problem.

**Ventilation:** Reliance on natural convection currents up the chimney is not normally an acceptable method of introducing sufficient fresh air into the oven to prevent a solvent/air explosion mixture forming. The oven should be fitted with mechanical exhaust ventilation. It is important that the exhaust draught should be applied at points in the oven where the rate of evaporation is a maximum, and that there are no dead spots in the oven space where there

is little air movement, with little dilution of the flammable VAPORS as a result. In order to improve the temperature distribution and to obtain an even flow of air throughout the oven it is normal to have some form of air recirculation. A proportion of the VAPOR and fume laden air should be extracted through a flue fitted with its own separate exhaust fan. Reliance on spillage of sufficient VAPOR and fume laden air through a rotund draught flue from the redirection system tends to be unsatisfactory. An interlock between the heat source and the exhaust ventilation is the normal method of ensuring that sufficient air is introduced into the oven for safety.

**Explosion Relief & Door Fastening:**

Although an oven may be provided with comprehensive precautions, explosions can still occur due to failure of components, inadequate servicing, or deliberate scotching of safety devices. The probability of fatal or serious injury to work people, or serious damage to the oven, can be reduced substantially if suitable explosion relief is provided, coupled with adequate securing of the doors of the oven to prevent their becoming missiles in the event of an explosion. It is recommended that explosion relief panels are fitted to all solvent evaporating ovens irrespective of chamber volume. These notes cover the bare essentials of the requirements for solvent evaporating ovens used in stovng and curing processes.

Model	PF30-SC	PF60-SC	PF120-SC	PF200-SC
<b>Max. Temp (°C)</b>	300	300	300	300
<b>Chamber Dimensions (mm)</b>	(H)	300	400	500
	(W)	292	392	492
	(D)	320	420	520
<b>Outside Dimensions (mm)</b>	(H)	470	570	670
	(W)	665	765	865
	(D)	470	570	670
<b>Chamber Capacity (Liters)</b>	28	66	128	230
<b>Weight (kg)</b>	30	45	60	75
<b>Shelves</b>				
<b>Number Supplied</b>	2	2	2	2
<b>Max. Possible</b>	3	5	9	15
<b>Max. Dist load/shelf kg</b>	10	10	10	10
<b>Max load kg</b>	20	30	40	50
<b>Performance</b>				
<b>Power Rating at 240V (watts)</b>	1000	1500	2000	2700
<b>Holding Power* at Max. temp. (watts)</b>	350	600	800	1250
<b>Temp. Stability on/off control (°C)</b>	±1.0	±1.0	±1.0	±1.0
<b>Temp. Stability PID control (°C)</b>	±0.2	±0.2	±0.2	±0.2
<b>Heat up Times* (Mins)</b>	<b>100°C</b>	4.5	4.5	4.5
	<b>200°C</b>	12	12	12
	<b>240V</b>	25	25	25
<b>Recovery Times* (Mins)</b>	<b>100°C</b>	1	1	1
	<b>200°C</b>	2.5	2.5	2.5
	<b>300°C</b>	4	4	4
<b>Door Open 60sec</b>	<b>240V</b>			
	<b>300°C</b>			
<b>Air Exchanges vol (l/h) @ 100°C</b>	10,000	10,000	10,000	10,000
<b>Air Exchanges (Exchanges/Hour)</b>	360	153	79	44





LHT 6/60

### LHT-Series, Laboratory High Temperature Ovens

#### Standard features:

- 400°C, 500°C or 600°C Operating temperatures.
  - 30, 60 & 120 Liter capacities.
  - 301 PID controller with ramp to set point function.
  - Heavy duty convection fan for good uniformity.
  - Low thermal mass insulation for energy efficiency & rapid heating.
  - Corrosion resistant, polished stainless steel interior .
  - 2 Multi-position shelves.
  - Suitable for continuous operation (see options\*) .
  - Double skin construction for cool safe outer case .
  - Hard wearing, zinc coated & stoved epoxy polyester coated exterior.
  - Chamber illumination (requires viewing window)\*\*.
  - Variable speed fan.
  - Floor stands & stacking frames.
  - Routine spares kit.
  - Extraction fan (may alter achievable uniformity).
  - Stoving & curing upgrade for use with small volumes of volatile solvent or paint fumes (comprises over temperature protection, extraction fan and an explosion relief panel.
- \*\*The stoving & curing option is not compatible with the viewing door or through door illumination options.

#### Options:

- Cable entry ports .
- Over temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation )\*.
- A range of sophisticated digital control & multi segment programmers is available.
- Optional over temperature protection recommended for continuous operation & to protect valuable contents.
- Process timer.
- RS232/RS485 communications.
- Viewing window.

Model	Max. Temp. (°C)	Temp. Stability (°C)	Temp. Uniformity (°C) @250°C	Heat-up time to Max. (mins)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ Accepted	Volume (Liters)	Max. Power (W)	Weight (kg)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
LHT4/30	400	±0.5	±5.0	50	10	300x300x305	570x860x550	2	30	1000	73	230V single phase
LHT4/60	400	±0.5	±5.0	-	16	400x400x405	670x930x670	2/3	60	1500	99	230V single phase
LHT4/120	400	±0.5	±5.0	-	20	645x455x405	920x1060x650	2/4	120	2250	179	230V single phase
LHT5/30	500	±0.5	±5.0	-	10	300x300x305	570x860x550	2	30	2000	73	230V single phase
LHT5/60	500	±0.5	±5.0	50	16	400x400x405	670x930x670	2/3	60	2250	99	230V single phase
LHT5/120	500	±0.5	±5.0	-	20	645x455x405	920x1060x650	2/4	120	3000	179	230V single phase or 3 phase
LHT6/30	600	±0.5	±5.0	70	10	300x300x305	570x860x550	2	30	2000	73	230V single phase
LHT6/60	600	±0.5	±5.0	-	10(+)	400x400x405	670x930x670	2/3	60	2250	99	230V single phase
LHT6/120	600	±0.5	±5.0	-	-	645x455x405	920x1060x650	2/4	120	3000	179	230V single phase or 3 phase

3 phase (uses 2 phases & neutral of 380/220V – 415/240V supply)

(+) Recovery to 500°C set -point



HT6/220

**HT4/5/6-Series, HT Industrial High Temperature**

Ideal for applications such as tempering, glass annealing, preheating and stress relieving these small scale industrial ovens are able to operate efficiently up to 600°C.

**Features:**

- 400°C, 500°C or 600°C maximum operating temperature.
- 28, 95 or 220 or 350 Liter capacity.
- 301 controller providing single ramp to set point or countdown process timing.
- Rugged well proven design.
- Excellent performance & reliability.
- Door locks easily operated whilst wearing gloves.
- Stainless steel liner.
- Steel section construction.
- Stainless steel mesh shelves.

**Options:**

- Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation).
- Digital process timer.
- Programmable controller.
- Additional shelves.
- Stoving & curing kit to extract volatile fumes.
- Chart recorders & paper free digital acquisition (DAQ) devices.
- Viewing window.
- Fixed or castor mounted floor stands.
- Standard spares kit.
- Bespoke specifications are available for AMS 2750 (NADCAP).



HT6/350

Model	Max. Temp. (°C)	Temp. stability (± °C)	Heat-up time to Max. (mins)	Temp. uniformity (± °C)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ accepted	Shelf loading Each/ total (kg)	Vol. (Liters)	Max. power (W)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
HT4/28	400	±0.5	60	±5.0	10	305x305x305	880x675x885	2/2	10 20	28	1000	Single phase
HT4/95	400	±0.5	60	±5.0	10	455x455x455	1010x880x1120	3/4	15 30	94	3000	Single phase
HT4/220	400	±0.5	60	±5.0	10	610x610x610	1160x1030x1280	3/4	25 50	227	4500	Single phase
HT4/350	400	±0.5	-	±5.0	-	700x700x700	1665x1710x1200	3/4	25 50	343	-	Single phase or 3 phase
HT5/28	500	±0.5	60	±5.0	16	305x305x305	880x675x885	2/2	10 20	28	2500	Single phase
HT5/95	500	±0.5	60	±5.0	16	455x455x455	1010x880x1120	3/4	15 30	94	3000	Single phase
HT5/220	500	±0.5	60	±5.0	16	610x610x610	1160x1030x1280	3/4	25 50	227	4500	Single phase or 3 phase
HT5/350	500	±0.5	-	±5.0	-	700x700x700	1665x1710x1200	3/4	25 50	343	-	Single phase or 3 phase
HT6/28	600	±0.5	75	±5.0	20	305x305x305	880x675x885	2/2	10 20	28	2000	Single phase
HT6/95	600	±0.5	70	±5.0	20	455x455x455	1010x880x1120	3/4	15 30	94	4500	Single phase or 2 phase
HT6/220	600	±0.5	90	±5.0	20	610x610x610	1160x1030x1280	3/4	25 50	227	6000	Single phase or 3 phase
HT6/350	600	±0.5	-	±5.0	-	700x700x700	1665x1710x1200	3/4	25 50	343	9000	3 phase

Minimum operating temperature approximately ambient plus 10°C. Uniformity is measured in an empty chamber with vents closed, after a stabilization period. Shelf loadings are based on evenly distributed weight.

## HTMA-Series, High Temperature Modified Atmosphere Ovens



HTMA 4/28 &amp; HTMA 4/95

## Standard features:

- 400°C, 500°C or 600°C Operating temperatures.
- 28, 95 & 220 Liter capacities.
- Digital PID temperature control using 301 controller including over-temperature protection.
- Rear mounted fan & side air guides give horizontal 'airflow'.
- Manual gas control via needle valves & flow meters (nickel brass).
- Corrosion resistant, ferritic grade 430, stainless steel interior with perforated non-tip shelves & runners.
- Copper pipe-work with brass flow-meter & solenoid valves .
- Single side hinged door, with metal heat seal & rubber gas tight seal, closed using none slam lever switch.
- Suitable for continuous operation (see options\*).
- Double skin construction for cool, safe, outer case.
- Hard wearing, zinc coated & staved epoxy polyester coated exterior.

## Options:

- Automatic gas control (requires a 3508 Series programmable controller).
- Manual electronic gas control using 2x flow meters & solenoid valves .
- Stainless steel pipe-work with brass flow-meter & solenoid valves .
- Stainless steel pipe-work, flow-meter & solenoid valves.
- A range of sophisticated digital control and multisegment programmers are available.
- RS232 / RS485 communications.
- Fixed or castor mounted floor stands.

A range of gas tight high temperature ovens for use with inert atmospheres in a batch production environment.

Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ Accepted	Volume (Liters)	Max. Power (W)	Weight (kg)	Power Supply
				Internal HxWxD(mm)	External HxWxD(mm)					
HTMA4/28	400	50	10	305x305x305	880x675x885	2	28	1000	73	230V single phase
HTMA4/95	400	75	16	455x455x455	1010x880x1120	3/4	95	3000	99	230V single phase
HTMA4/220	400	120	20	610x610x610	1160x1030x1280	3/4	220	3000	179	230V single phase
HTMA5/28	500	50	10	305x305x305	880x675x885	2	28	2000	73	230V single phase
HTMA5/95	500	75	16	455x455x455	1010x880x1120	3/4	95	3000	99	230V single phase
HTMA5/220	500	120	20	610x610x610	1160x1030x1280	3/4	220	4500	179	230V single phase or 3 phase
HTMA6/28	600	50	10	305x305x305	880x675x885	2	28	2000	73	230V single phase
HTMA6/95	600	75	16	455x455x455	1010x880x1120	3/4	95	4500	99	230V single phase
HTMA6/220	600	120	20	610x610x610	1160x1030x1280	3/4	220	6000	179	230V single phase or 3 phase

Uniformity is measured in an empty chamber with vents closed, after a stabilization period

\* Nominal values based upon a representative sample of products



PO/350

**PO350, Thermoplastic Sheet Preheating Oven**

This model is an application specific design specifically intended for the softening of thermoplastic sheet materials held in frames prior to draping over a vacuum forming mould. This configuration has found particular favour for use with material used in fabricating prosthetic limbs.

**Features:**

- 50°C to 250°C operating temperature range.
- 301 PID temperature controller with digital set & display.
- Ramp to set-point or process control timer.
- Forced air circulation for optimum temp. uniformity.
- Top mounted fan .
- Single drop down door.
- Single shelf.
- 430 Grade corrosion resistant ferritic stainless steel chamber.
- Heating from mineral insulated metal sheathed elements.
- 50mm top vent.

**Options:** Independent over-temperature protection with digital set and display • Digital process timer • Interior lighting • Fixed or castor mounted floor stands.

Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Temp. stability °C PID	Temp. uniformity 300°C (±°C)	Recovery time to Max. (mins)	Dimensions		Shelves	Vol. (Liters)	Max. Power (W)	Weight (kg)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
PO350	300	58	±1.0	±7.0	-	380x1200x760	730x1490x920	Single shelf 760x1200	346	6000 -	119	415V 3 phase



DO200

**DO200, Thermoplastic Draping Oven**

This model is an application specific design specifically intended for the softening of thermoplastic sheet materials held in frames prior to draping over a vacuum forming mould. This configuration has found particular favour for use with material used in fabricating prosthetic limbs.

**Note:** The oven requires but does not include as standard a "draping frame" that is compatible with the work being undertaken.

**Features:**

- 50°C to 300°C operating temperature range.
- 301 PID temperature controller with digital set & display.
- Ramp to set-point or process control timer.
- Forced air circulation for optimum temperature uniformity.
- 15W internal chamber illumination.
- Single pair of shelf runners supplied to accept a single clamp frame 406 x 406mm.
- Heating from mineral insulated metal sheathed elements.

**Options:** Independent over-temperature protection with digital set and display • Digital process timer • Fixed or castor mounted floor stands.

Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Temp. stability °C PID	Temp. uniformity 300°C (±°C)	Recovery time to Max. (mins)	Dimensions		Shelves	Vol. (Liters)	Max. Power (W)	Weight (kg)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
DO200	300	58	±0.5	±3.5	10	700x592x520	920x965x670	1 set of runners for frames 406 x 406	215	2250 1160	75	230V or 110V single phase

## CR-Series, Class 100 Clean Room Ovens



CR/30

All sources of particulate contamination are fully sealed. The sealed stainless steel interior and gloss white epoxy finish make the ovens easily cleaned.

**Options:**

Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation) • HEPA filtered airflow available • Digital process control timers & multi segment programmers available • Paperless DAQ (Data Acquisition) graphical recorders available • Top access port for independent thermocouple • Cable access port • Viewing window door • Through door illumination system • Stacking frame to enable units to be stacked one upon another • Key-lock door • Door switch to cut off power when the door is open • Fully customized through wall (flange fitted) designs are available.

**Standard features:**

- Designed for operation within Class 100 environments (US FED STD 209E) .
- 250°C maximum operating temperature .
- 30 to 1790 Liter chamber volumes.
- Fully sealed low thermal mass insulation to avoid shedding fibres .
- Fully enclosed brush less fan motor .
- PID controller, with single ramp to set-point facility .
- Smooth easily cleaned gloss epoxy exterior
- Polished stainless steel sealed interior enables use of inert gas atmosphere.
- Perforated stainless steel shelves .
- Particle free silicone rubber door seal.
- Membrane control panel with clear bright LED display.
- Double skin construction for cool safe outer case temperature .
- Fully adjustable chamber ventilation.



Model	Max. Temp. (°C)	Temp. Stability (°C)	Temp. Uniformity (°C) @250°C	Heat-up time to Max. (mins)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/ Accepted	Shelf Loading Each/ Total (kg)	Volume (Liters)	Max. Power (W)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
CR/30	250	±0.2	±3.0	35	4	310x310x310	655x460x670	2/3	10 20	30	1000	230V single phase
CR/70	250	±0.2	±3.0	35	4	310x470x470	655x620x820	2/5	10 30	68	1500	230V single phase
CR/130	250	±0.2	±4.0	35	4	550x470x470	895x620x820	3/9	10 40	121	2000	230V single phase
CR/180	250	±0.2	±5.0	58	5	770x470x470	1115x620x820	3/15	10 50	170	2500	230V single phase
CR/220	250	±0.2	±5.0	75	4	610x610x610	1130x780x850	3/5	15 45	227	3000	single phase
CR/330	250	±0.2	±5.0	80	6	915x610x610	1440x780x850	4/8	15 60	340	4500	single phase or 3 phase
CR/450	250	±0.3	±5.0	75	9	1220x610x610	1750x780x850	5/11	15 75	450	6000	3 phase
CR/840	250	±0.3	±5.0	-	-	1525x915x610	2050x1065x850	6	15 -	850	12000	3 phase
CR/1790	250	±0.3	±5.0	-	-	1220x1220x1220	1750x1420x1450	5	15 -	1810	18000	3 phase

Minimum operating temperature approximately ambient plus 200°C. Uniformity values are measured in an empty chamber, with vents closed after a stabilization period. Shelf loadings are based on evenly distributed weight



HTCR 6/95 & HTCR 6/28

**HTCR-Series, HTCR High Temperature Clean Room**

All sources of particulate contamination are fully sealed, whilst the sealed stainless steel interior and gloss white epoxy finish make the ovens easily cleaned. Bespoke ovens are available with pass through construction or with flanges for through wall mounting into the clean room area.

**Features:**

- Designed for operation within Class 1000 environments (US FED STD 209E).
- 400°C, 500°C or 600°C maximum operating temperatures.
- 28 to 1000 Liter chamber volumes.
- Fully sealed low thermal mass insulation avoids shedding fibres.
- Fully enclosed brush less fan motor.
- 301 controller, with single ramp to set-point facility.
- Smooth easily cleaned gloss epoxy exterior.
- Polished stainless steel sealed interior.
- Perforated stainless steel shelves.
- Particle free silicone rubber door seal.
- Membrane control panel with clear bright LED display.
- Double skin construction for cool safe outer case temperature.
- Fully adjustable chamber ventilation.

**Options:**

- Over-temperature protection to DIN 12-880 class 2 (recommended to protect valuable contents & for unattended operation).
- Digital process control timers & multi segment programmers available.
- Paperless DAQ (Data Acquisition) graphical recorders available.
- Top access port for independent thermocouple.
- Cable access port.
- Viewing window door.
- Through door illumination system.
- Stacking frame.
- Key-lock door.
- Door switch.
- Fixed or castor mounted floor stands.
- Through wall (flange fitted) as well as fully bespoke designs are available.



Model	Max. Temp. (°C)	Heat-up time to Max. (mins)	Temp. stability °C	Temp. uniformity 250°C (±°C)	Recovery time to Max. (mins)	Dimensions		Shelves Fitted/accepted	Shelf loading Each/total (kg)	Vol. (Liters)	Max. Power (W)	Power Supply
						Internal HxWxD(mm)	External HxWxD(mm)					
HTCR4/28	400	50	±0.5	±5.0	10	305x305x305	580x675x885	2/2	10/20	28	1000	230V single phase
HTCR4/95	400	90	±0.5	±5.0	10	455x455x455	1010x810x1120	3/5	15/30	95	3000	230V single phase
HTCR4/220	400	75	±0.5	±5.0	16	610x610x610	1160x1030x1280	3/5	10/50	220	6000	230V single phase
HTCR4/500	400	-	±0.5	±5.0	-	800x800x800	1305x1115x1450	3/5	-	500	7500	single phase or 3 phase
HTCR4/1000	400	-	±0.5	±5.0	-	1000x1000x1000	1310x1530x1635	3/5	-	1000	12000	3 phase
HTCR5/28	500	75	±0.5	±5.0	16	305x305x305	880x675x885	2/2	10/20	28	2000	230V single phase
HTCR5/95	500	110	±0.5	±5.0	16	455x455x455	1010x810x1120	3/5	15/30	95	3000	single phase
HTCR5/220	500	105	±0.5	±5.0	16	610x610x610	1160x1030x1280	3/5	10/50	220	4500	single phase or 3 phase
HTCR5/500	500	-	±0.5	±5.0	-	800x800x800	1305x1115x1450	3/5	10/20	500	9000	single phase or 3 phase
HTCR5/1000	500	-	±0.5	±5.0	-	1000x1000x1000	1310x1530x1635	3/5	15/30	1000	15000	3 phase
HTCR6/28	600	110	±0.5	±5.0	20	305x305x305	880x675x885	2/2	10/50	28	2000	3 phase
HTCR6/95	600	110	±0.5	±5.0	20	455x455x455	1010x810x1120	3/5	10/20	95	4500	3 phase
HTCR6/220	600	120	±0.5	±5.0	20	610x610x610	1160x1030x1280	3/5	15/30	220	6000	3 phase
HTCR6/500	600	-	±0.5	±5.0	-	800x800x800	1305x1115x1450	3/5	-	500	12000	single phase or 3 phase
HTCR6/1000	600	-	±0.5	±5.0	-	1000x1000x1000	1310x1530x1635	3/5	-	1000	15000	3 phase

Minimum operating temperature approximately ambient plus 10°C. Uniformity is measured in an empty chamber with vents closed, after a stabilization period. Shelf loadings are based on evenly distributed weight.

**CR1-2, Inert Gas Class 100 Clean room Oven, 200°C, HEPA Filter**



MRC clean air ovens incorporate all the special features needed for high temperature clean room work: a fully welded stainless steel interior, two adjustable perforated stainless steel shelves, rapid heat recovery, & two separate LED digital displays for time and temperature that show setpoint or up-to-the-second process information. The controller provides a 24-step ramp and soak, 0.1°C control, & multiple levels of operator access. A sealed membrane touch-pad control panel protects the controllers. These units also have three adjustable air intake and exhaust ducts that are easily removed for cleaning and allow the use of either room or recirculated air. A nitrogen inlet port for purging is standard to prevent contamination. MRC clean room ovens are made with 3.5 inches of high temperature, wrap-around insulation and a high-temp. silicone door gasket. Please note that the filter may be weakened if the oven is operated above 200°C.

**Features:**

- Horizontal Air Flow
- Encapsulated Insulation
- HEPA Filtration
- Nitrogen Purging
- 24-Step Ramp and Soak PID Controller
- Stainless Steel Interior & Exterior
- Built-in Over temperature Protection
- 24 Month Limited Warranty.

**Applications:**

**Health care Industry**

- Annealing the plastics on syringes and catheters
- Adhesive curing & coating curing on pacemakers
- Curing the coating on stents
- Polymerizing contact lenses
- Curing the coating on eye glass lenses.

**Manufacturing**

- Curing, drying, heating wafers & electronic components
- Epoxy and adhesive curing
- Die bond curing
- Baking of coatings.



Model	CR1-2
Capacity (Liters)	110
Interior dimension (mm)	W432xD508xH510
Exterior dimension (mm)	W890xD737xH965
Temperature range	15°C above ambient to 200°C
Heat-up Time(minutes)	10 to 110°C (35 to 180°C)
Temp. uniformity	±1.0°C at 110°C
Electrical specifications	Volts: 220V Hertz: Watts: 2200 Amps: 12
Temp. recovery time	4 minutes to reach 110°C
Shelves	2 Supplied (8 maximum)



1408DIG

**Analog Model For Accuracy and Economy**

The Models 1407-2/1408-2 feature hydraulic thermostats & corrosion resistant stainless steel interior. A 13mm thick tempered glass observation window resists breakage under vacuum & permits easy viewing of the chamber interior. Glass viewing windows are "spring mounted" which allows the door to close squarely, thus ensuring a tight seal around the oven door. Furthermore, the door gasket has a beaded edge which also ensures vacuum integrity. Door gaskets are designed to be easily removable & interchangeable. The standard gasket supplied with all models is made of highly resistant SILICONE rubber. Also available as optional accessories are application specific gaskets. The BUNA-N gasket is available for solvent applications & is limited to a maximum temperature of 125°C. The Fluorosilicone gasket is available for applications involving acids & is limited to a maximum temperature of 200°C.

**Digital Model for Top Performance & Accuracy**

The Model 1407DIG feature PID (Proportional Integral Differential) controllers. This controller delivers precise temp. stability & repeatability. Dual digital display of setpoint & actual chamber temperature.

**Specifications:**

Model Analog	1407-2	1408-2
Model Digital	1407DIG	1408DIG
<b>Chamber Capacity (Liters)</b>	16	47
<b>Temperature Range</b>	Ambient 15-210°C	
<b>Temperature Uniformity</b>	±3°C @ 60°C, ±9°C @ 120°C, ±13°C @ 200°C	
<b>Heat up time, Minutes</b>	90 minutes to 150°C	
<b>Shelves Supplied</b>	3	2
<b>Outside dimensions(mm)</b>	H572xD483xW394	H642xD705xW470
<b>Inside dimensions(mm)</b>	H228xD304xW228	H304xD508xW304
<b>Weight</b>	27Kg	50Kg
<b>Watts/Amps-230Volt</b>	550/2.4	1200/5.2
<b>Cycle</b>	50/60 Hz	
<b>Phase</b>	Single	

**1407-2/1408-2, Small Vacuum Ovens**

Vacuum ovens are used for a wide variety of vacuum drying, curing and moisture content testing. Common applications include drying heat sensitive samples, moisture determination, & drying heat sensitive samples under a controlled atmosphere.

MRC vacuum ovens are specifically designed for unparalleled performance when utilized for these, and other, applications. Since there is no air in the vacuum chamber, heat is transferred from the heating elements to the interior chamber wall, then to the shelves, and finally to the samples.

MRC Vacuum ovens maximize conductive heat techniques. To minimize conductivity resistance, ALUMINIUM shelves are provided with all MRC vacuum ovens. The oven chambers are wrapped in high temperature insulation which aids overall performance and promotes energy efficiency. MRC offers both standard ANALOG vacuum ovens with mechanical thermostat & Digital PID controlled models. Both ranges include unique design features which enhance the overall performance of the ovens. These features include durable construction with corrosion resistance stainless steel chambers, true vacuum valves, cross-flow ventilation through the oven chamber, and interchangeable door gasket for application specific use. Independent, resettable circuit breakers prevent any electrical overload.



1408DIG

**Options:**

- Temperature Programmer 4 programs of 16 segments, Model: Eurotherm 2416P4.
- RS-232/485 communication. Model: Eurotherm 3216E.
- Oil vacuum pump.
- Oil Free vacuum pump.







1425-2

**1425-2/1445-2/1465-2, Small/Medium Vacuum Ovens**

All our vacuum ovens are built with a stainless steel chamber for exceptional durability. Our double plenum design meets UL, CSA and EU safety requirements resulting in a cool outer surface. The doors on these units have positive latch handles with spring-loaded glass to facilitate a good vacuum seal without hinge binds that shorten the gasket life. A selection of gaskets (for specific applications) and a small bench top footprint increase the versatility of these ovens. The unique cross-flow ventilation forces inert gas to fill the entire chamber. To achieve required vacuum levels, users can choose from a 3/8 inch orifice or a KF25 fitting to withstand heavy use & minimize draw-down time. Maximum permitted end vacuum is 10 μ. Leak rate is 10 μ per hour.

**Features:**

- Fully Programmable Watlow Temperature Control
- Capable of 40 Step Ramp and Soak Profiles or 4 Files With 10 Steps Per File
- Digital Vacuum Gauge
- RS485 Communication.

**Applications:**

- Moisture Determination
- Out Gassing Solids
- Aging Tests
- Plating
- Chemical Resistance Studies
- Drying of Paper
- Rubber and Textiles
- Desiccating
- Dry Sterilization
- Out Gassing Liquids
- Vacuum Storage
- Electronic Process Control.



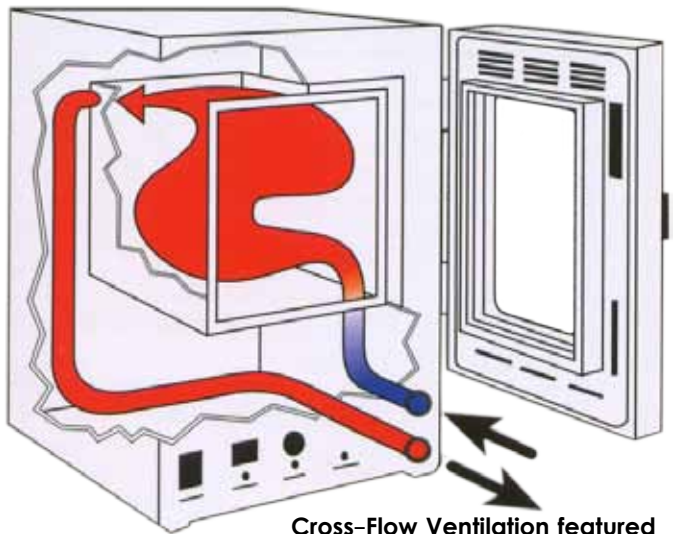
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1445-2/1465-2



1425-2



**Cross-Flow Ventilation featured in all Vacuum Ovens**

**Precise Temperature Control:**

- Heat-up Time 90 minutes to 150°C
- Temperature Adjustable by 0.1°C
- Temperature Uniformity ±6% of Set Point
- Temperature Range Ambient +10°C to 220°C.

**Specifications:**

Model	1425-2	1445-2	1465-2
Capacity (Liters)	16	47	127
Chamber dimensions (mm)	W228xD304xH228	W304xD508xH304	W457xD609xH457
Outside dimensions (mm)	W445xD578xH597	W520xD750xH667	W673xD876xH819
Temp. Range / Uniformity	10°C above ambient to 220°C / ±6% of set point		
Electrical Specifications	Volts: 120V Hertz: 50/60 Hz Watts: 850W Amps: 7.0A	Volts: 120V Hertz: 50/60 Hz Watts: 1100W Amps: 9.0A	Volts: 120V Hertz: 50/60 Hz Watts: 1500W Amps: 12.5A
Temperature Control	0.1°C		
Heat-up (min)	90 minutes at 150°C		
Shelves	3 Supplied		

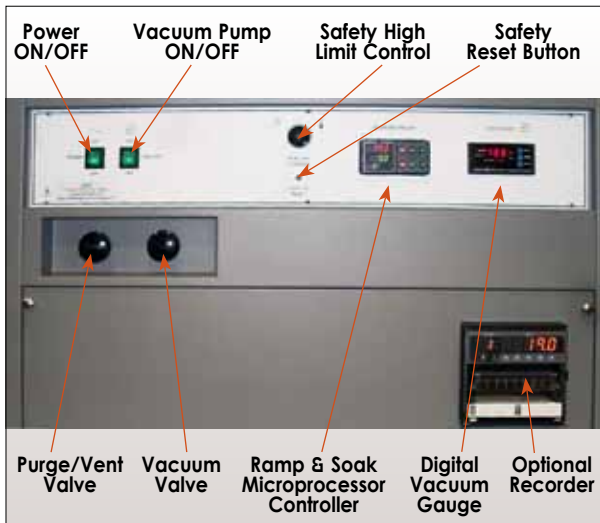


1495D

**Features/Benefits:**

- Large capacity is efficient and accommodating
- Ramp and Soak Controller
- Stainless Steel Interior
- KF40 Fitting Included
- All stainless steel construction
- Programmable Controller
- Digital Vacuum Gauge for accuracy
- Cross-flow ventilation allows for a dry oxygen free environment.
- System ready to receive vacuum pump.

**Panel:**



**Applications:**

- Vacuum drying & curing
- Moisture determination
- Out-gassing solids & liquids
- Aging tests
- Electronic process control
- Vacuum embedding
- Vacuum storage
- Plating

**1495D, Large Vacuum Oven**

**Unique Design.** The 1495D Model is a general purpose vacuum oven specially designed for professional and industrial use. The combination of the oven and a ruggedly constructed mobile stand creates an ideal vacuum application station.

The stand is designed for mounting a vacuum pump at the base. All vacuum plumbing and KF25 connections are provided (vacuum pump not included).

**Precision Controllers.** The Waltow 981 temp. controller, programmable and microprocessor-based, offers multiple ramp and soak capabilities, including storing and running up to 24 temperature profiles. The controls are easily adjustable and the control panel is user friendly. A digital vacuum gauge shows chamber vacuum level in measurements of Torr and m/Torr. The display range is 760 Torr down to 0 mil Torr. A secondary independent high limit controller provides over temperature safety protection.

**Rugged Construction.** High grade stainless steel construction is used for the exterior and chamber interior. Vacuum valves incorporate 3/8" brass orifices to withstand heavy use.



**Introduced Gas Saturates Chamber Uniformly.**

Our unique cross-flow ventilation design forces nitrogen or other inert gases to fill the entire chamber. Gas is forced across the greatest distance of the chamber, purging the chamber as it passes over the samples. Corrosion-resistant stainless steel tubing is used for the gas purge piping system. Use this feature to reduce effects of oxidation.

The oven chamber is wrapped in high temperature insulation which aids overall performance and promotes energy efficiency. Powder coat construction, true vacuum valves and cross-flow ventilation through the oven chamber enhance total performance. The vacuum oven is secured to a ruggedly constructed mobile stand to create a vacuum pump at the base. Although the oven is not supplied with a vacuum pump, all vacuum plumbing and KF25 connections are provided.

Model	1495D
<b>System Type</b>	Vacuum Oven Station
<b>Controls/Display</b>	Digital mProc.
<b>Chamber Capacity (Liters)</b>	264
<b>Temperature range</b>	Amb. +5°C to 220°C
<b>Temp. uniformity</b>	±7.0°C at 150°C
<b>Heat up (min)</b>	90 minutes at 150°C
<b>High Limit Control</b>	Yes-Independent
<b>Outside DIM. (mm)</b>	W915xD1182xH1575
<b>Inside DIM. (mm)</b>	W711xD609xH609
<b>Vacuum Gauge</b>	Digital-m/Torr Scale
<b>Standard Gasket Material</b>	Viton
<b>Shelves Supplied</b>	3 Aluminium
<b>Maximum Shelves</b>	7 Shelves
<b>Shipping Weight in kilograms</b>	445kg
<b>Element Wattage</b>	3500
<b>Electrical Requirements:</b>	
<b>Max. Amp draw at 220Vac</b>	16
<b>Power Frequency/Phase</b>	50-60 Hz/ Single Phase

\* - 2 Denotes 220V

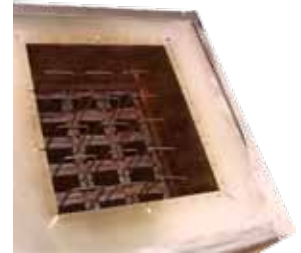


VHT 75/550

**VHT 75/550, Electrode Oven**

Shaft furnace (loading from the top) is designed for welding electrodes heating and drying up to 550 °C.

- Maintains up to 40 kg of 45 cm electrodes
- 15 containers are inside for electrodes storage
- Temperature range + 50–+550 °C, temperature adjustable
- Micro processor temperature controller
- Door opening to the top
- Chamber is made from stainless steel
- Exterior is treated and painted with a powder paint RAL 7035, abrasion and corrosion resistant finish
- Durable Steel construction means long product life
- Natural air convection
- Thermal insulating wool makes oven energy efficient and keeps electrodes hot and moisture-free.



Baskets Inside

Model	Capacity	T °C	Chamber dimensions (mm)	Overall dimensions (mm)	Power	Voltage	Weight
	l	Max	WxDxH	WxDxH	kW	V	kg
VHT 75/550	75	550	340x390x550	870x660x850	6.00	230	100



VHT 3/320

**VHT 3/320, Electrode Oven**

The dry storage container is for dry /dry storage / transportation of welding electrodes.

- Maintains up to 10 kg of 45 cm electrodes
- 2 containers for electrodes storage are inside
- Temperature range + 60–+320 °C, temperature adjustable
- Exterior is treated and painted with a powder paint RAL 7035, abrasion and corrosion resistant finish
- Durable Steel construction means long product life.
- Oven is comfortable for transport to the job
- fitted wheels and handle help to transport electric oven and place it to the right place in the work area
- Thermal insulating wool makes oven energy efficient and keeps electrodes hot and moisture-free.

Model	Capacity	T °C	Chamber dimensions (mm)	Overall dimensions (mm)	Power	Voltage	Weight
	l	Max	WxDxH	WxDxH	kW	V	kg
VHT 3/320	3	320	100x500x125	230x770x435	1.00	230	14



VHT 4.9/100

**VHT 4.9/100, Electrode Oven**

Portable electrode oven is designed for dry storage and transportation of welding electrodes.

- Maintains up to 5 kg electrodes of 40 cm
- Temperature range + 60 - +140 °C, temperature non-adjustable
- Durable, stainless steel construction means long product life
- Oven design protects electrodes during transfer from the holding oven to the job

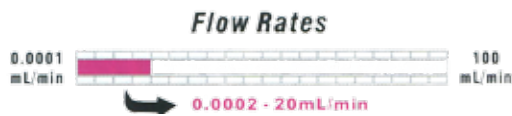
- Light weight oven makes for easy transport to the job
- Square shape gives greater stability vertically or horizontally while working
- Thermal insulating wool makes oven energy efficient and keeps electrodes hot and moisture-fr.

Model	Capacity	T °C	Chamber dimensions (mm)	Overall dimensions (mm)	Power	Voltage	Weight
	l	Max	WxDxH	WxDxH	kW	V	kg
VHT 4.9/100	4.9	140	110x90x440	150x180x510	0.18	230	6

# P PERISTALTIC PUMPS Basic, Flow 0.0002–20ml/min



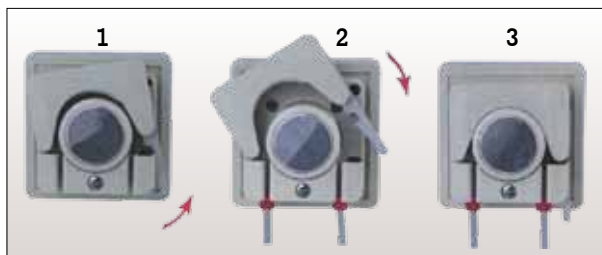
## PP-X-20, Basic Micro Peristaltic Pump



PP-X-20 peristaltic pump combines low flow and compact size into a single pump that mounts in the equipment rack or panel. The pump provides flow rates from 0.0002 to 20.0 mL/min. And it can be operated through hand-held remote controller, analog interface or RS485. White and black colors are available.

### Features:

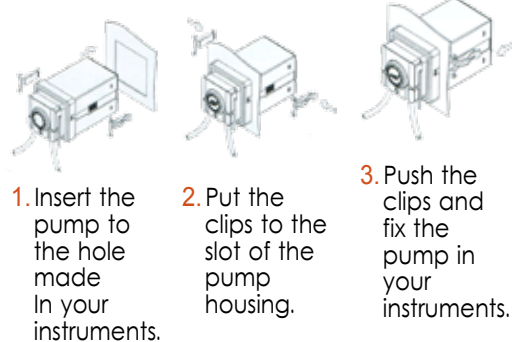
- **Prime Function:** Fast Filling, Fast Emptying
- **Memory function**
- **Ideal for OEM:** Compact size, Light weight
- **Installation Modes:** Inlaid, Rack
- **Control Modes:** Hand-held remote controller, Analog external control, Communication external control
- **Tubing Loading:** Flexible, Reliable.



### Specifications:

<b>Speed</b>	1 to 50rpm, reversible
<b>Speed resolution</b>	1rpm (External control 0.1rpm)
<b>Speed control</b>	Hand-held remote controller
<b>Display</b>	Hand-held remote controller displays speed range and running status
<b>External control</b>	Start/stop & cw/ccw control, 0 to 5V, 0 to 10V, 4 to 20mA and 0 to 10kHz speed control
<b>Communication interface</b>	RS485
<b>Power Supply</b>	DC 12V/1A adapter
<b>Power consumption</b>	<10W
<b>Operating condition</b>	Temperature 0 - 40°C Relative humidity <80%
<b>Drive dimensions (LxWxH)</b>	135x72x72 (mm)
<b>Controller DIM. (LxWxH)</b>	105x50x16 (mm)
<b>Drive weight</b>	0.5kg
<b>IP rating</b>	IP 31

### OEM Installation Sketch:



### Standard Configuration:

- Pump Head
- Drive
- Hand-held Remote Controller
- Adapter
- Data Wire.

### Optional Accessories:

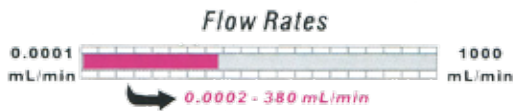
- Small V-base (149-1-000020)
- Polished Stainless Steel Frame Tube (149-1-000021)
- Fixed Plate (149-1-000022).

Model	Pump Head	Flow Rates (mL/min)	Tubing (mm)	Weight (Kg)
PP-X-20	YZ1014	0.0002-20	Wall Thickness: 0.8 - 1.0 Inner Diameter: s 3.17 ex. 0.5x0.8 1 x1 2x1 2.4x0.8 3x1 etc.	0.5



PP-X-380

PP-X-380, Basic Peristaltic Pump



Acceptable pump heads for PP-X-380 are YZ1515x, YZ2515x, YZ1115, YZ1125, DG-1 and DG-2. The pump provides flow rates from 0.0002 to 380 mL/min.

The speed can be adjusted manually or automatically through external control. Store the running parameters automatically. Easy to operate.

Specifications:

Speed	1 to 100rpm, reversible
Speed resolution	0.1rpm
Speed control	Membrane keypad
Display	3-digit LED displays current rpm
External control	Start/stop, cw/ccw control, 0 - 5 V, 0 - 10 V, 4 - 20 mA & 0 - 10kHz speed control
Power supply	AC 90 V - 260 V 50/60 Hz
Power consumption	≤30W
Operating condition	Temperature 0 to 40°C Relative humidity <80%
Dimensions (LxWxH)	232x142x149 (mm)
Drive weight	2.3kg
IP rating	IP 31

Functions and Features:

- Applicable pump heads: YZ1515x, YZ2515x, YZ1115, YZ1125, DG -1, DG - 2
- Prime key: For fast filling and emptying
- Communication function: RS485
- External control: Start/stop and cw/ccw control, 0 - 5V, 0 - 10V, 4 - 20mA, 0- 10kHz speed control
- Adjust speed manually or automatically through external control interface
- Memory function: Storing the running parameter automatically
- Membrane keypad, easy to operate
- Good performance and economical price
- Indoor use only.

Applicable pump heads:



YZ1515x/YZ2515x

YZ1115/YZ1125

DG-1

DG-2

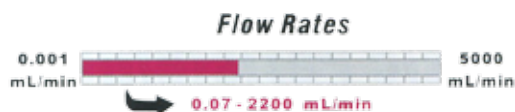
Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-X-380	YZ1515x, YZ1115	0.007 - 380	13# 14# 19# 16# 25# 17# 18#	3.0
	YZ2515x	0.17 - 270	15# 24#	3.0
	YZ1125	0.17 - 270	15# 24#	3.0
	DG - 1 (6 Rollers)	0.00025 - 48	Wall Thickness: 0.8 - 1.0mm Inner Diameter: ≤3.17mm	2.5
	DG - 1 (10 Rollers)	0.0002 - 32		2.5
	DG - 2 (6 Rollers)	0.00025 - 48		2.6
	DG - 2 (10 Rollers)	0.0002 - 32 (2 channels)		2.6

# P PERISTALTIC PUMPS Basic, Flow 0.07–2200ml/min



PP-X-2200

## PP-X-2200/PP-X-1100, Basic Peristaltic Pumps



Standard External Control Interface- Order Separately

Acceptable pump head of YZ1515x, YZ2515x, YZ II 15, YZ II 25. The pump delivers flow rates from 0.07 to 2200 ml/min. The speed can be adjusted manually or automatically through external control interface. Dispensing function can be realized by connecting dispensing controller FK-1 C.

### Specifications:

Model	PP-X-1100	PP-X-2200
Speed	1 to 300rpm, reversible	1 to 600rpm, reversible
Speed precision	1rpm	
Speed control	Rotary encoded switch	
Display	3-digit LED displays current speed	
External control	start/stop and cw/ccw control, 0 to 5V, 0 to 10V, 4-20 mA and 0 to 10Hz speed control	
Power supply	AC 90V - 260V 50/60Hz	
Operating condition	Temp. 0 to 40°C Relative humid. < 80%	
Dimensions (LxWxH)	285x207x180 (mm)	
Drive weight	3.6kg	3.8kg
Power consumption	< 48W	< 100W
IP rating	IP 31	

### Functions and Features:

- Applicable pump heads: YZ1515x, YZ2515x, YZII15, YZII25
- Prime button for fast filling and emptying
- Adjust speed manually or automatically through external control
- Memory function, storing the running parameters automatically
- Realize computer control through RS-485 communication interface
- Indoor use only.

### Applicable Pump Heads:



YZ1515x/YZ2515x

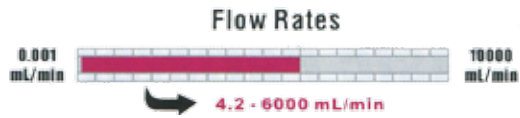
YZII15/YZII25

Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-X-1100	YZ1515x, YZII15	0.07 - 1140	13# 14# 19# 16# 25# 17# 18#	4.0
	YZ2515x, YZII25	1.7 - 870	15# 24#	
PP-X-2200	YZ1515x, YZII15	0.07 - 2200	13# 14# 19# 16# 25# 17# 18#	4.2
	YZ2515x	1.7 - 1600	15# 24#	
	YZII25	1.7 - 1600	15# 24#	



PP-X-6000

PP-X-6000, Basic Peristaltic Pump



PP-X-6000 peristaltic pump adopts brushless DC motor. It has features of high output torque, low vibration, high efficiency and free maintenance. It can drive double pump heads. It accepts many pump heads and delivers flow rates from 4.2 to 6000mL/min. The speed can be adjusted manually or automatically through external control.



Specifications:

Speed	60 to 600rpm, reversible
Speed accuracy	±1.0%
Speed resolution	1.0rpm
Output torque	≥1.50 N-M
External control	Start/stop & cw/ccw control, 0.5 to 5V, 1 to 10V, 4 to 20mA and 1-10kHz speed control
Communication interface	RS485
Power supply	AC 176 - 264V 50Hz/60Hz
Power consumption	≤200W
Operating condition	Temperature 0 to 40°C Relative humidity < 80%
Dimensions (LxWxH)	285x207x180 (mm)
Drive weight	5.2kg
IP rating	IP 31

Functions and Features:

- Prime button for fast filling and emptying
- Memory function: Store the speed and the address of the pump
- Communication function: Realize the computer control through RS485 interface
- Display: 3 digits LED displays the speed of the pump
- External control input: Control the speed, start/stop and direction of the pump
- Suitable for different pump heads and tubing for multiple application
- High output torque which can drive double pump heads
- Brushless DC motor, high output torque and free maintenance
- Operation mode: SWitch, button and knob. Easy to operate.

Applicable pump heads:



Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-X-6000	(1,2) xYZ1515x	4.2 - 2200	13# 14# 19# 16# 25# 17# 18#	5.6-6.0
	(1,2) xYZII15			
	(1,2) xYZ2515x	100 - 1600	15# 24#	
	(1,2) xYZII25	100 - 3000	15# 24# 35# 36#	6.0
	KZ25	200 - 6000		
	DG15 - 24	50 - 1800	16# 25# 17#	6.0
	DMD25 (≤350rpm)	30 - 4000	119# 120# 15# 24# 35# 36#	7.7

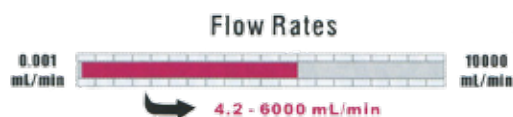
# P PERISTALTIC PUMPS Basic Industry, Flow 4.2–6000ml/min



PP-W-6000

0.5-5V  
4-20mA  
1-10V  
1-10kHz

## PP-W-6000, Basic Peristaltic Pump



PP-W-6000 peristaltic pump is high IP rating and high efficiency. It adopts brushless DC motor and speed closed loop control. It has features of high output torque, low vibration and free maintenance. It accepts multiple pump heads and delivers flow rates from 4.2 to 6000 mL/min (single channel).

LAB

INDUSTRIAL



Standard External Control Interface- Order Separately

### Specifications:

Speed	60 to 600rpm
Speed accuracy	±1.0%
Speed resolution	1.0rpm
Output torque	≥1.50 N-M
Display	3 digits LED displays current speed; 4 digits LED display the working state
Memory function	Storing the running parameters automatically
External control	0.5 - 5V, 1 -10V, 4 - 20mA or 1 - 10kHz are corresponding to 60 - 600 rpm
Communication interface	RS485
Power supply	AC 176 - 264V 50Hz/60Hz
Power consumption	≤200W
Operating condition	Temperature 0 to 40°C Relative humidity < 80%
Drive Dimensions(LxWxH)	273x190x272 (mm)
Drive weight	7.3kg
IP rating	IP 31

### Functions and Features:

- High IP rating: Suitable for moist and dust working condition
- Prime key: For fast filling and emptying
- Memory function: Storing the running parameters automatically
- Communication function: Realize the computer control through RS485 interface
- Display: 3 digits LED displays the speed of the pump
- External control input: Control the speed, start/stop and direction of the pump
- Suitable for different pump heads and tubing
- High output torque which can drive double pump heads
- Brushless DC motor, high output torque, free maintenance
- Operation mode: Switch and membrane keypad. Easy to operate.

### Applicable pump heads:



YZ1515x/YZ2515x

YZII15/YZII25

DMD25

KZ25

DG15-24

Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-W-6000	(1,2) xYZ1515x	4.2 - 2200	13# 14# 19# 16# 25# 17# 18#	7.7-8.1
	(1,2) xYZ2515x			
	(1,2) xYZII25	100 - 1600	15# 24# 35# 36#	
	KZ25	100 - 3000	16# 25# 17#	8.1
	DG15 - 24	200 - 6000		8.1
	DMD25 (≤350rpm)	50 - 1800	30 - 4000	119# 120# 15# 24# 35# 36#



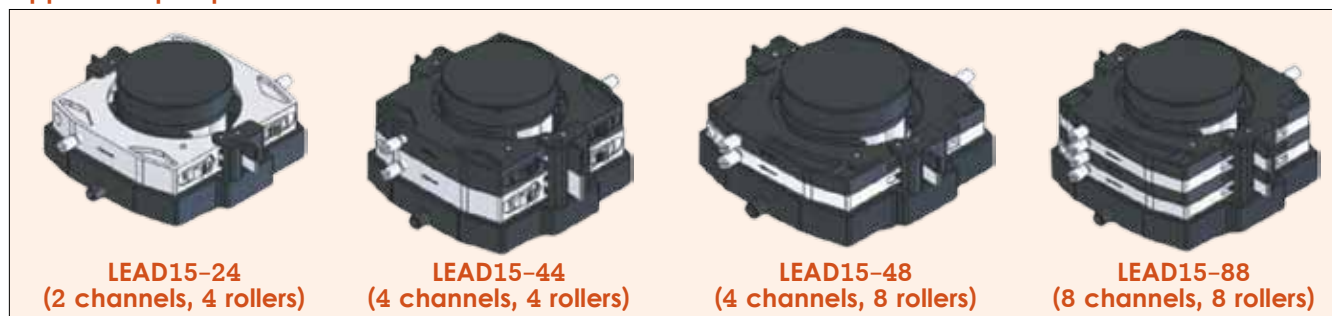


PP-F-380

**Specifications:**

<b>Speed</b>	1.0 to 100.0 rpm, reversible
<b>Speed resolution</b>	0.1rpm
<b>Speed Control</b>	Rotary encoded switch coupled with membrane keypad
<b>Display</b>	128x32 graphic LCD displays current running status
<b>External control</b>	Start/stop & cw/ccw control, 0 to 5V, 0 to 10V, 4 to 20mA and 0-10kHz speed control
<b>Communication interface</b>	RS485
<b>Power supply</b>	AC 90 – 260V 50Hz/60Hz
<b>Power consumption</b>	≤50W
<b>Operating condition</b>	Temperature 0 to 40°C Relative humidity < 80%
<b>Dimensions (LxWxH)</b>	190x162x275 (mm)
<b>Drive weight</b>	3.5kg
<b>IP rating</b>	IP 31

**Applicable pump heads:**



**LEAD15-24**  
(2 channels, 4 rollers)

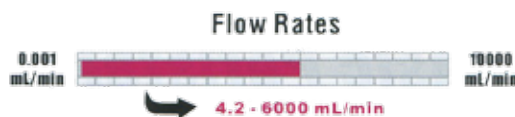
**LEAD15-44**  
(4 channels, 4 rollers)

**LEAD15-48**  
(4 channels, 8 rollers)

**LEAD15-88**  
(8 channels, 8 rollers)

Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-F-380	LEAD15-24	1 – 380	16# 25# 17#	4.36
	LEAD15-44			4.42
	LEAD15-48	0.005 – 75	Inner Diameter ≤3.17mm, Wall Thickness 0.8 –1.0mm	4.48
		0.07 – 20		
	LEAD15-88	0.005 – 75	Inner Diameter ≤3.17mm, Wall Thickness 0.8 –1.0mm	4.48
		0.07 – 20		

**PP-F-380, Flow Rates Peristaltic Pump**



The acceptable pump heads for PP-F-380 are Lead15-48, Lead15-88, Lead15-24, Lead15-44 and max. 8 channels are available. The pump delivers flow rates from 0.005 to 380 mL/min. It has flow rates display and flow rates calibration functions. It also has functions of speed adjustment, start/stop, cw/ccw, prime (rinsing), tubing selection, RS485 communication, analog control, etc.



**Functions and Features:**

- Vertical structure
- Accept 4 special pump heads
- Display can switch between flow rates and speed
- Calibration function for the flow rates
- Computer control available through RS485 communication
- Prime key for fast filling and emptying.

# P PERISTALTIC PUMPS Flow Rates, Flow 0.002–500ml/min

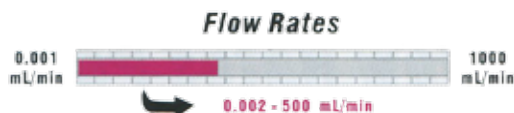


PP-L-500

### Specifications:

<b>Speed</b>	1.0 to 100rpm, reversible
<b>Speed resolution</b>	0.1rpm
<b>Speed control</b>	Rotary encoded switch coupled with membrane keypad
<b>Display</b>	128x64 graphic LCD displays current running status
<b>External control</b>	start/stop & cw/ccw control, 0 to 5V, 0 to 10V, & 4 to 20mA speed control
<b>Communication interface</b>	RS485
<b>Power supply</b>	AC 220V ± 10% 50Hz/60Hz(standard) AC 110 V ± 10% 50Hz/60Hz(optional)
<b>Power consumption</b>	<50W
<b>Operating condition</b>	Temperature 0 to 40°C Relative humidity < 80%
<b>Drive Dimensions(LxWxH)</b>	202x160x239 (mm)
<b>Drive weight</b>	5.34kg
<b>IP rating</b>	IP 31

### PP-L-500, Flow Rates Peristaltic Pump



The max. output torque of PP-L-500 drive is 1.65 N·M. Multiple pump heads are available. The pump delivers flow rates from 0.002 to 500 mL/min. 128 x 64 graphic LCD displays running menus and parameter setting menus. The flow rates and the speed (rpm) can be displayed in the same screen. The display interfaces are friendly. It has flow rates calibration function. It has many control modes. The external control can be realized through standard external interface or RS485 communication interface.

### Functions and Features:

- Display can switch between flow rates and rpm
- Calibration capability for the flow rates
- Graphic LCD together with rotary encoded switch make the pump easy to use
- Higher torque to accept more pump heads and more channels
- RS485 communication interface available. Offering communication protocol to customer and customizing software according to customer's requirements.

LAB

Standard External Control Interface- Order Separately

FLOW-RATE

### Applicable pump heads:



DG-2 to DG-24 YZ1515x/YZ2515x

YZ115/YZ1125

DG15-24/28/48

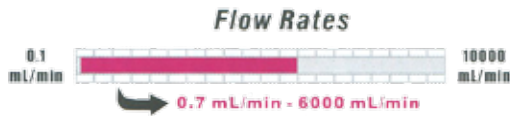
Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-L-500	DG15 - 24	1 - 380	16# 25# 17#	6.16
	DG15 - 28/DG15-48	0.005 - 75	Wall Thickness: 0.8 -1.0 (mm) Inner Diameter: ≤3.17mm 13# 14#	6.01
	DG - (2,4,6,8,12,16,24) (6,10 rollers)	0.0025 - 48 (6 rollers) 0.002 - 32 (10 rollers)	Wall Thickness: 0.8 -1.0 (mm) Inner Diameter: ≤3.17mm	5.82 - 8.70
	(1,2,3,4) xYZ1515x (1,2,3,4) xYZ1115	0.07 - 380	13# 14# 19# 16# 25# 17# 18#	5.76 - 7.02
	(1,2,3,4) xYZ2515x	1.7 - 270	15# 24#	5.76 - 7.02
	(1,2) xYZ1125	1.7 - 500	15# 24# 35# 36#	5.70 - 6.04



PP-F-500

Model	PP-F-500	PP-F-6000
Speed	0.1-100rpm, reversible	10-600rpm, reversible
Dispensing volume	0.01 mL to 9.99L	0.1 mL to 9.99L
Speed resolution	0.1rpm	1rpm
Copy number	0 to 9999, 0 means unlimited c cle.	
Pause time	0.1 see to 99.9 min	
Flow rates calibrating time	0.5-30min	
External Control	Start/stop & cw/ccw control, 0 to 5V, 0 to 10V, 4-20mA and 0 to 10Hz speed control	
Output interface	Start/Stop, direction output & 0-10 kHz frequency output, OC gate output	
Operating condition	Temperature 0-40 °C, relative humidity <80%	
Drive DIM.	285x207x180 (mm)	
Power Supply	AC100-240V, 50/60Hz	AC176-264V±10%,50/60Hz
Power consumption	<40W	<140W
Drive weight	3.8kg	5.2kg
IP rating	IP 31	

PP-F-500/PP-F-6000, Dispensing Peristaltic Pump



These two kinds of Dispensing Peristaltic Pump can dispense liquid precisely and have calibration function. They can be controlled through standard external interface or RS485 communication interface.



Functions and Features:

- Small liquid volume dispensing: PP-F-6000 can dispense liquid volume in mL unit, and PP-F-500 can dispense liquid volume in µL and mL unit
- Back suction function: In dispensing mode, the pump runs reversely after finishing on filling operation to prevent the liquid from dripping
- Operating mode: Membrane keypad and rotary encoded switch
- Control mode: Pumps can be controlled by membrane on it or through external control
- Display: LCD displays current running status and parameters
- Prime Key: For fast filling and emptying
- Memory function: Storing the running parameters automatically
- Calibration function: The flow rates and dispensing volume can be calibrated
- Communication interface: RS485, MRC company can provide relative protocol.

Applicable pump heads:



Model	Pump Head	Flow Rates (* /min)	Tubing	Weight (Kg)
PP-F-500	YZ1515x, YZ1115	7µL - 380mL	13# 14# 19# 16# 25# 17# 18#	4.2
	YZ2515x	0.17mL - 270mL	15# 24#	
	YZ 11 25	0.17mL - 500mL	15# 24# 35# 36#	
	DG-1, DG-2, DG-4 (6 rollers)	0.25mL - 48mL	Wall Thickness: 0.8 - 1.0 (mm) Inner Diameter: ≤3.17 mm	4.0 - 4.2
DG-1, DG-2, DG-4 (10 rollers)	0.2mL - 32mL			
PP-F-6000	(1,2) xYZ1125	0.7 - 2200	13# 14# 19# 16# 25# 17# 18#	5.6 - 6.0
	(1,2) xYZ1115			
	(1,2) xYZ2515x	17 - 1600	15# 24#	
	(1,2) xYZ1125	17 - 3000	15# 24# 35# 36#	6.0
	KZ25	34 - 6000		
	DG15 - 24	8.2 - 1800	16# 25# 17#	6.0
DMD25 (≤350rpm)	5 - 4000	119# 120# 15# 24# 35# 36#	7.7	

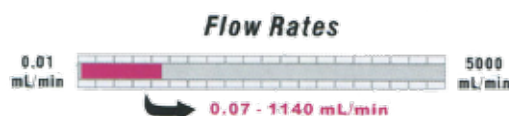
\* Max. speed for DMD25 is 350 rpm

# P PERISTALTIC PUMPS Dispensing, Flow 0.07–1140ml/min



PP-F-1140

## PP-F-1140, Dispensing Peristaltic Pump



LAB



Standard External Control Interface- Order Separately

FLOW-RATE

DISPENSING

Applicable pump heads for PP-F-1140 are YZ1515x, YZ2515x, YZ1115, YZ1125. The pump delivers flow rates from 0.07 to 1140 mL/min. 128 x 64 graphic LCD displays running menus and parameters setting menus. The display interfaces are friendly. It has many control modes. The external control can be realized through standard external control interface or RS485 communication interface.

### Functions and Features:

- Acceptable pump heads: YZ1515x, YZ2515x, YZ1115, YZ1125
- Set pause time to realize dispensing and filling automatically
- Display can switch between flow rates and rpm
- Calibration function for the flow rates
- RS485 communication interface available. Offering communication protocol to customer and customizing software according to customer's requirements.

### Specifications:

Speed	1.0 to 300rpm, reversible
Speed resolution	1rpm
Speed control	Rotary encoded switch coupled with membrane keypad
Display	128x64 graphic LCD displays flow rates, speed or dispensing mode
Copy number	1 to 999
Dispense volume	0.1mL to 99.9L
Pause time	1 to 999 s
Back suction angle	0 to 360, 18° increments
External control	Start/stop and cw/ccw control, 0 to 5V, 0 to 10V, and 4 to 20mA speed control
Output interface	Start/Stop, direction output and 0-10 kHz frequency output, OC gate output
Communication interface	RS485
Power supply	AC 220V ± 10% 50Hz/60Hz(standard) AC 110 V ± 10% 50Hz/60Hz(optional)
Power consumption	<50W
Operating condition	Temperature 0 to 40°C Relative humidity < 80%
Drive Dimensions(LxWxH)	202x160x239 (mm)
Drive weight	4.3kg
IP rating	IP 31

### Applicable pump heads:



YZ1115/YZ1125

YZ1515x/YZ2515x

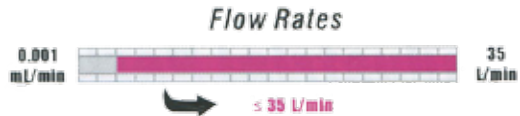
Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-F-1140	YZ1515x YZ1115	0.07 - 1140	13# 14# 19# 16# 25# 17# 18#	4.7
	YZ2515x YZ1125	1.7 - 870	15# 24#	4.7

INDUSTRIAL

IP55

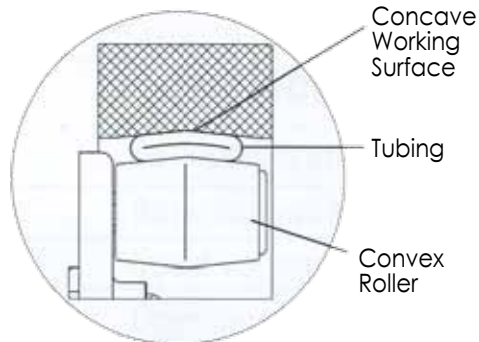
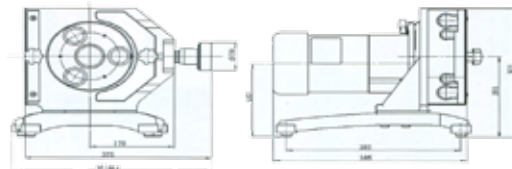


PP-B-35L, Batch Transferring Pump



Functions and Features:

- High-power pumps, and the maximum flow rates can reach 35L/min
- The structure of concave working surface and convex roller realizes the tubing self-position function. It reduces abrasion and prolongs tubing life
- Variable frequency speed control to AC motor with creeper gear
- Adjustable occlusion
- Strong drive
- Pump head operation is visible through transparent front cover.

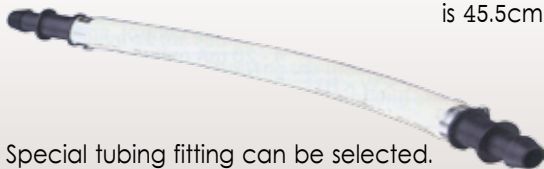


Specifications:

Model	PP-B-35L
Speed	30-350rpm, reversible
Speed resolution	0.6rpm
Power Supply	AC220V ± 10%, 50/60Hz
Power consumption	<400W
Operating condition	Temperature 0 to 40°C Relative humidity < 80%
Dimensions (LxWxH)	417x401x321 (mm)
Pump weight	32kg
IP rating	IP 55

Tubing Fitting Structure:

The length of the tubing between two fitting is 45.5cm.



Special tubing fitting can be selected. Low cost tubing can be used outside of the pump head if using tubing fitting. Suitable for industrial application.

Tubing Loading:

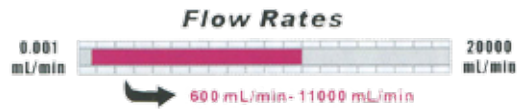
1. Turn the knob -1- -2- counter clockwise
2. Turn the hand wheel to loose the compression block
3. Pull the knob -3- and take out the front cover.
4. Select suitable tubing slots. Place the tubing between the roller and the compression block, then put the tubing in the corresponding tubing slots.
5. Pull the knob -3-, insert the front cover, tighten the knob -1-
6. Turn the hand wheel and adjust the occlusion between the roller and the compression block
7. Tighten the knob -2- and fix the compression block.

Model	Pump Head	Flow Rates (L/min)	Tubing	Weight (Kg)
PP-B-35L	KZ48/63	1.3 - 15	88#	32
		3 - 35	92#	

# P PERISTALTIC PUMPS Industrial, Flow 600–11000ml/min



## PP-X-11L, Industrial Peristaltic Pump



**INDUSTRIAL**

**IP54**

**WATER PROOF**

The pump delivers flow rates from 600 to 11000 mL/min. The speed can be adjusted manually or automatically through external control interface. Driven by DC motor YT6001J has higher torque and can drive double pump heads. Suitable for industrial applications which need high pressure and flow rates.

### Applicable pump heads:



### Specifications:

<b>Speed</b>	60-600 (rpm) , reversible
<b>Speed control</b>	10 turn potentiometer
<b>Power supply</b>	AC 220V ± 1 0% 50/60Hz
<b>Power consumption</b>	<400W
<b>Operating condition</b>	Temperature 0 to 40°C Relative humidity < 80%
<b>External control</b>	Start/stop control, speed control (0 - 10kHz, 0 - 10V, 4 - 20mA optional, 4 - 20mA is standard configuration)
<b>Dimensions (LxWxH)</b>	325x236x193 (mm)
<b>Drive weight</b>	20kg
<b>IP rating</b>	IP 54

### Functions and Features:

- Acceptable pump heads: YZ35-13, KZ35
- Suitable for industrial applications
- Can be equipped with MRC Dispensing Controller for filling function when connecting single channel pump head.

Model	Pump Head	Flow Rates (mL/min)	Tubing	Weight (Kg)
<b>PP-X-11L</b>	YZ35-13	600 - 11000	73# 82#	21.65
	KZ35	600 - 11000		23.7
	2xYZ35-13	600 - 11000		23.3
	2xKZ35	600 - 11000		27.4



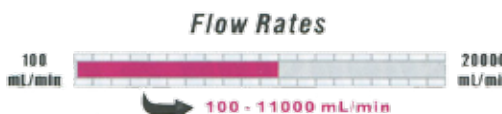
4–20mA  
1–10kHz  
0–10V  
0–5V

PP-F-11L

**Specifications:**

Model	PP-F-11L
<b>Flow Rates</b>	100 to 1100ml/min
<b>Dispensing volume</b>	100ml to 999 Liters
<b>Speed</b>	10–600rpm
<b>Copy Number</b>	0 to 9999, "0" means running continuously
<b>Pause time</b>	1s to 99.9min
<b>Back suction</b>	a to 9.9 revolutions, (precision is 0.1 revolution)
<b>Calibration time</b>	30 to 1800 seconds
<b>External control input</b>	Start/stop control, direction control, flow rates control (0–5V, 0–10V, 4 – 20mA , 0–10kHz optional)
<b>External control output</b>	Start/stop output, direction output, 0–7.5kHz frequency output corresponding to 0 to 600rpm
<b>Communication interface</b>	RS485
<b>Power</b>	AC 176 – 264V, 50/60Hz
<b>Power consumption</b>	<300W
<b>Operating condition</b>	Temperature 0 to 40°C Relative humidity < 100%
<b>DIM. (LxWxH)</b>	360 x 215 x 243 (mm)
<b>Drive weight</b>	12Kg
<b>IP Rating</b>	IP 65

**PP-F-11L, Industrial Peristaltic Pump**



PP-F-11L is a high IP rating and high efficient pump with high-power DC brushless motor, it is suitable for working in dust and damp industrial environment. It delivers flow rates from 100 to 11000 ml/min and dispensing volume from 100ml to 999 Liters when loading YZ35 or KZ35 pump head. WT6004F adopts 128 x 32 LCD to display all the running information and parameters and membrane keypad to set parameters. It is easy to operate. This pump can be controlled manually or externally through standard external control module and RS485.

INDUSTRIAL

IP65

FLOW-RATE

DISPENSING

WATER PROOF

**Functions and Features:**

- Acceptable pump head: YZ35–13, KZ35
- Back suction: Prevent dripping of liquid when dispensing a certain liquid volume
- Operating mode: Membrane keypad to set parameters and operation
- Control mode: Pump can be controlled internally through membrane keypad or externally through external control modules
- Display: LCD displays all the running information and parameters
- Prime function: Fast filling or emptying the tubing
- Memory function: Save the parameters and working status automatically
- Calibration: The flow rates and dispensing volume can be calibrated.

**Adopting water-proof aviation plug as external control interface to transmit external control signal.**

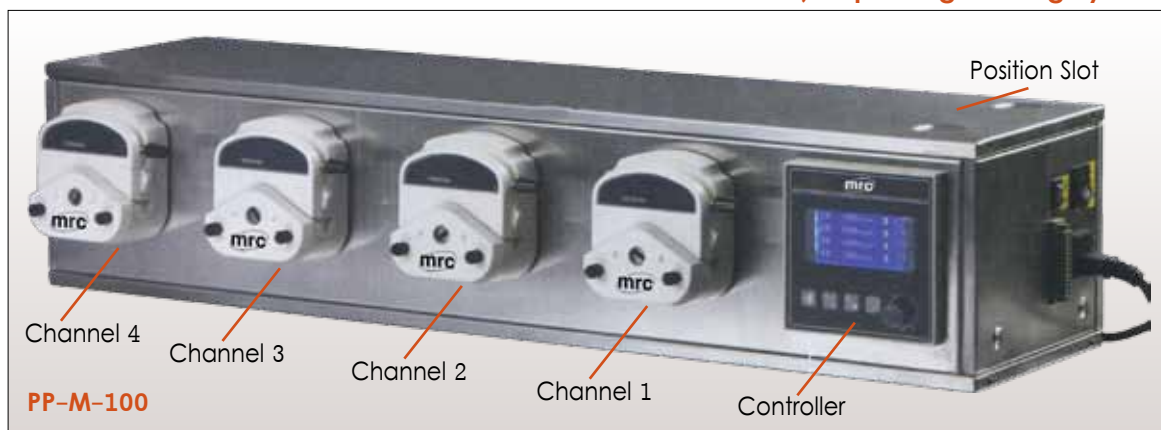
Model	Pump Head	Housing Material	Flow Rates (mL/min)	Tubing	Weight (Kg)
PP-F-11L	YZ35-13(1,2)	PSU	100 – 11000 (Single Channel)	73# 82#	13.65 – 15.3
	KZ35 (1 ,2)	304 Stainless Steel			15.7 – 19.4

# P PERISTALTIC PUMPS Dispensing & Filling System

## PP-M-100, Dispensing & Filling System

FLOW-RATE

DISPENSING



### Specifications:

Dispensing volume	0.5 – 100mL
Dispensing time	0.5 – 30s
Time precision	0.01s
Max. speed	600rpm
Back suction time	0.00 – 1.00s
External control	Filling-start, filling-stop without bottles (Contact closure)
Filling unit dimensions (LxWxH) for 4 channels	800x200x174(mm)
Filling unit weight for 4 channels	18.7kg
IP rating	IP 31

Dispensing and Filling System is the peristaltic pump system with auto control function. It consists of 3, 4 or 5 units peristaltic pumps of autonomous working and a dispensing and filling controller. It can be mounted on the dispensing and filling acquirments to realize non-contaminated and accurate dispensing and filling for medicine or fluids. It adopts stacking structure. Different combinations are available to meet the requirements of the customers.

### Functions and Features:

- One unit has 3, 4 or 5 channels. Max. 12, 16 or 20 channels (4 units) are available
- Each channel is controlled separately. Easy to use
- Back suction function is available. Avoid liquid spillage
- Control parts adopt plug in structure. Easy to maintain
- Flow rates calibration function for the dispensing volume
- Realize the function of filling stop without bottles
- 128 x 64 graphic LCD display and friendly user interface
- Computer control is available through RS485 communication.



Model	Pump Head	Dispensing (mL)	Tubing	Dispensing Time (s)	Speed (rpm)	Accuracy ±%	Productivity (pcs/min)
PP-M-100	YZ1515x YZ2515x	0.5	13#	1.2	350	2	25
		1	13#	2	425	1	15
		2	14#	1	450	2	30
		3	14#	1	450	2	20
		5	19#	1.2	500	2	25
		7	16#	1.2	428	2	25
		10	25# 15#	1	360	2	30
		20	17# 24#	1.2	375	2	30
		50	17# 24#	2	550	1	15
		100	17# 24#	4	550	0.5	15



**OEM, Products**

**OEM Applications:**

- Fluids sampling of inspection or testing instruments
- Dispensing and filling fluids equipment
- Feeding of fluids equipment
- Other fluids transfer

Type	Introduction	Functions and Features	Specifications
 <p><b>BTM10/TH15</b></p>	<p>OEM10 has eleven kinds of optional fixed speed which can deliver max. flow rates of 167 ml/rnin, it is one of ideal OEM product and has been widely used in environment monitoring, ferment, and filling industry, etc.</p>	<p>OEM10 adopts AC synchronous motor which has stable speed and high repeatability. Pump head with two spring rollers can reduce the abrasion of tubing and prolong the tubing life.</p>	<p>Speed: Eleven kinds of fixed speed                      Power supply: AC220V 50-60Hz                      Power consumption: 15W                      Dimension: 105.5 x 110 x 80 (mm)                      Weight: 0.7kg</p>
 <p><b>BTMBJ60-01/WX10</b></p>	<p>The pump delivers flow rates from 0.001 to 24 mL/min. The speed can be adjusted by BCD dial switch which is divided into 15 levels, or controlled by external pulse.</p>	<p>Suitable for tubing which the inner diameter is less than 3.17 mm and wall thickness is from 0.8 to 1.0 mm. Reasonable and fine shape, compact size, DC power supply, ideal for OEM.</p>	<p>Speed: 0-60rpm, reversible                      Speed precision: 1 rpm                      Speed control: BCD dial switch                      Power supply: DC12V/1A                      Power consumption: ≤10W                      Dimension: 116x60x73(mm)                      Weight: 0.55 kg</p>
 <p><b>BTMBJ100-01/JY15-12</b></p>	<p>The pump delivers flow rates from 0.7 to 170 mL/min. The speed can be adjusted by BCD dial switch which is divided into 15 levels, or controlled by external pulse.</p>	<p>Suitable for tubing with wall thickness of 1.6mm. Low speed, high flow rates, long life. Reasonable and fine shape, compact size, DC power supply, ideal for OEM</p>	<p>Speed: 0 – 100 rprn, reversible                      Speed precision: 1 rpm                      Speed control: BCD switch, the increment is 5 rpm when the speed is less than 50 rpm and the increment is 10 rpm when the speed is more than 50 rpm                      Power supply: DC12V/2A                      Power consumption: Less than 25W                      Dimension: 118x60x86(mm)                      Weight: 0.58 kg</p>
 <p><b>BTM103/DG-2</b></p>	<p>OEM103 adopts step motor with bracket and shock absorption parts which reduce the vibration and make it easy to load pump head. It has been widely used in flow injection analysis instrument and ultraviolet radiation analysis instrument.</p>	<p>Driver need to be designed or selected to drive the step motor. Acceptable pump heads are VZ and DG Series pump heads.</p>	<p>Max. Speed: 100 rpm COG pump heads)                      300 rpm (VZ pump heads)                      Dimension: 130x120x115(mm)                      Weight: 1.2 kg</p>
 <p><b>BTMDC12-02/WX15-12</b></p>	<p>OEMDC12-02/WX15-12 delivers the maximum flow rates of 22ml/rnl, small size; it is suitable to be built in customers equipment.</p>	<p>OEMWX15-12 adopts DC gear motor and 16# silicon tubing, user can control flow rates by adjusting voltage of motor.</p>	<p>Speed: 0-100 rpm, reversible                      Power supply: DC12V                      Dimension: 70x60x50(mm)                      Weight: 0.2kg</p>
 <p><b>BTMT1 00-S1/JY15-24</b></p>	<p>OEMT100-S1 is one kind of small &amp; medium flow rates, dual-channel OEM peristaltic pump; it has compact structure and provides flow rates from 0.1 to 43ml/min with various tubing. Easy to operate, user can use BCD dial switch to adjust speed manually or use 4-20mA external control module to a adjust speed.</p>	<p>Acceptable pump head: JV15-24                      Suitable tubing: 13#, 14#, 19#, 16#                      External control: Start/stop, direction control, speed control (4-20mA corresponding to 0.1-100rpm)                      Manual control: BCD dial switch to adjust speed 5 to 100 rpm.</p>	<p>Manual control speed range: 5-100rpm                      External control speed range: 0.1-100rpm, speed precision is 0.1rpm.                      Power supply: DC11.4-25.2V                      Power consumption: ≤10W                      Dimensions (LxWxH): 134x82x90 mm                      Weight: 0.86kg</p>

## Tubing selection factors:

### ● Chemical Compatibility –

When transfer different fluids, the tubing should have good chemical characteristics, which is chemical compatibility. Such as: low absorption, good temperature resistance, not easy to aging, not swelling, anti-corrosion, fewer extractable. Chemical resistance decreases as temperature increases. Chemicals that have no effect on the tubing at room temperature could attack the tubing at elevated temperatures.

Chemical compatibility test method:

When the chemical compatibility of the tubing is uncertain, an immersion test is needed.

In an immersion test, a small piece of tubing is weighed, and its diameter and length are measured. The tubing then is immersed in a closed vessel with the chemical in question for a minimum of 48 hours. Afterward, the test piece of tubing is rinsed, dried, weighed and measured, and any changes are recorded. The tubing also should be examined for signs of softening or embrittlements, which indicate the chemical has attacked the tubing.

### ● Pressure –

Peristaltic pump applications typically have been limited by the pressure capabilities of the tubing. If the pressure is too high, the tubing could swell, resulting in an improper fit through the pump head, which causes excessive wear and tubing failure. The factors which affect the pressure are material, the proportion of diameter and wall thickness, etc.

### ● Temperature –

The working temperature range of a tubing material is another important consideration. Different materials have different temperature range.

### ● Dimension –

The size of the tubing has a direct effect on the amount of fluid delivered. Well-designed pumps are engineered to work with an optimum tubing size or range of tubing sizes, taking into account the tubing's inner diameter and wall thickness. The inner diameter determines the amount of fluid delivered with each turn of the rotor. The wall thickness affects the tubing's ability to spring back to its original shape

## Features of peristaltic pump tubing:

- Good flexibility. Spring back after pressed radially
- Good wear abrasion resistance
- A certain extent pressure bearing capabilities
- Lower gas permeability
- Low absorption, good temperature resistance, not easy to aging, not swelling, anti-corrosion, fewer extractable.

## Tubing parameters:

Inner diameter and wall thickness are the main parameters of the tubing. Different manufacturers have different notations. Such as: specification codes or inner diameter x wall thickness.

## Tubing materials:

Silicon rubber, rubber, plastic, synthetic material, etc. Different materials have different characteristics and different applications.

after each compression, which has a great influence on the overall life of the tubing.

### ● Dimension –

The size of the tubing has a direct effect on the amount of fluid delivered. Well-designed pumps are engineered to work with an optimum tubing size or range of tubing sizes, taking into account the tubing's inner diameter and wall thickness. The inner diameter determines the amount of fluid delivered with each turn of the rotor. The wall thickness affects the tubing's ability to spring back to its original shape after each compression, which has a great influence on the overall life of the tubing.

### ● Tubing Flex Life –

Different tubing materials have differing abilities to withstand the repeated squeezing action of the rollers. In general, each tubing size, tubing material, pump head style, and operating speed in combination has its own life characteristics. Service life, or flex life in the pump, is the primary concern in a new application. Pump performance is very consistent in a specific application. Maximize the life of a pump system by selecting a tubing material that offers long flex life, using thicker wall tubing, and/or by operating a larger pump at slower speed.

## Tubing Types which MRC Company Can Provide:












**Domestic silicone tubing** – Platinum-cured silicone tubing: Ultra-smooth inner liner with extremely low leachables, good flexibility, translucent and wide temperature range of -60 to 238°C.

**Imported tubing** – Tygon®, PharMed®BPT, Viton®, Fluran®, Norprene®, etc.












Note:

- Specific types of above tubing refer to "Peristaltic Pump Configuration Table".
- Please contact Loner Company to know all the specification of above tubing.







**Tubing Specifications:**  
Micro & small flow tubing

Tubing Sizes		0.13x0.86	0.5x0.86	0.86x0.86	1.52x0.86	2.06x0.86	2.4x0.86	2.79x0.86	3.17x0.86	1x1	2x1	3x1
Tubing cross sections (1:1)												
Wall thickness(mm)		0.86								1.0		
Inner diameter(mm)		0.13	0.5	0.86	1.52	2.06	2.4	2.79	3.17	1.0	2.0	3.0
Max. pressure (Mpa)	Continuous	0.1										
	Intermittent	0.1										

**Medium flow tubing**

Tubing Sizes		13#	14#	19#	16#	25#	17#	18#	15#	24#	35#	36#	
Tubing cross sections (1:1)													
Wall thickness of domestic tubing(mm)		1.6						2.4					
Inner diameter of imported tubing(inch)		1/16"						3/32"					
Inner diameter of domestic tubing(mm)		0.8	1.6	2.4	3.1	4.8	6.4	7.9	4.8	6.4	7.9	9.6	
Inner diameter of imported tubing(inch)		1/32"	1/16"	3/32"	1/8"	3/16"	1/4"	5/16"	3/16"	1/4"	5/16"	3/8"	
Max. pressure (Mpa)	Continuous	0.17			0.14	0.10	0.07	0.17			0.14		
	Intermittent	0.27			0.24	0.14	0.10	0.27			0.24		

**Industrial tubing**

Tubing Sizes		73#	82#	86#	90#	88#	92#
Tubing cross sections (1:1)							
Wall thickness of domestic tubing(mm)		3.3		6.3			4.8
Wall thickness of imported tubing(inch)		1/8"		1/4"			3/16"
Inner diameter of domestic tubing(mm)		9.6	12.7	9.6	19	12.6	25.4
Inner diameter of imported tubing(inch)		3/8"	1/2"	3/8"	3/4"	1/2"	1"
Max. pressure (Mpa)	Continuous	0.17	0.07	0.14			
	Intermittent	0.27	0.14	0.14			

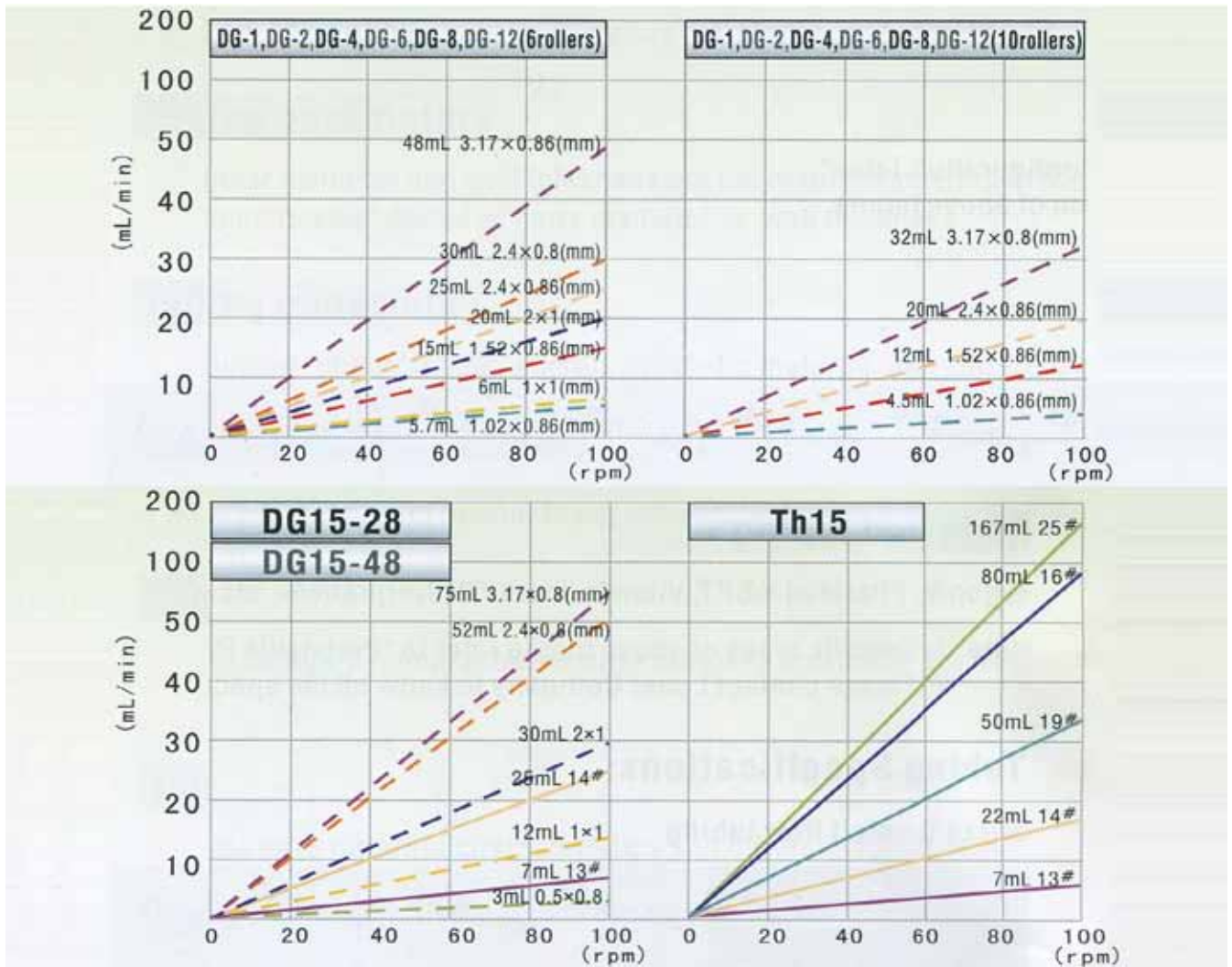
## Pumps Tubing:

Model	Inner Dia. (mm)	Wall Thickness (mm)	Suitable Pump Head	Specifications	Standard Package
Tube-S-13#	0.8	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Silicon Tubing	15M
Tube-S-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Silicon Tubing	15M
Tube-S-19#	2.4	1.6	YZ1515X YZII15 TH15	Silicon Tubing	15M
Tube-S-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Silicon Tubing	15M
Tube-S-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Silicon Tubing	15M
Tube-S-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Silicon Tubing	15M
Tube-S-18#	7.9	1.6	YZ1515X YZII15	Silicon Tubing	15M
Tube-S-15#	4.8	2.5	YZ2515X YZII25 KZ25	Silicon Tubing	15M
Tube-S-24#	6.4	2.5	YZ2515X YZII25 BZ25 KZ25	Silicon Tubing	15M
Tube-S-35#	7.9	2.5	KZ25 YZII25	Silicon Tubing	15M
Tube-S-36#	9.6	2.5	KZ25 YZII25	Silicon Tubing	15M
Tube-S-73#	9.5	3.3	YZ35 YZ35-13	Silicon Tubing	15M
Tube-S-82#	12.7	3.3	YZ35 YZ35-13	Silicon Tubing	15M
Tube-S-86#	9.5	6.3	KZ48/63	Silicon Tubing	15M
Tube-S-88#	12.7	4.7	KZ48/63	Silicon Tubing	15M
Tube-S-90#	19	6.35	KZ48/63	Silicon Tubing	15M
Tube-S-92#	25.4	4.76	KZ48/63	Silicon Tubing	15M
Tube-S-0.5×0.8	0.5	0.8	DG JY10 WX10 DG15-28(48)	Silicon Tubing	15M
Tube-S-1×1	1	1	DG JY10 WX10 DG15-28(48)	Silicon Tubing	15M
Tube-S-2×1	2	1	DG JY10 WX10 DG15-28(48)	Silicon Tubing	15M
Tube-S-2.4×0.8	2.4	0.8	DG JY10 WX10 DG15-28(48)	Silicon Tubing	15M
Tube-S-3×1	3	1	DG JY10 WX10 DG15-28(48)	Silicon Tubing	15M
Tube-S-1×1sss	1	1	DG JY10 WX10 DG15-28(48)	Silicon Tubing	12pc
Tube-S-2×1sss	2	1	DG JY10 WX10 DG15-28(48)	Silicon Tubing	12pc
Tube-S-2.4×0.8sss	2.4	0.8	DG JY10 WX10 DG15-28(48)	Silicon Tubing	12pc
Tube-NA-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28 (48)	Norprene®A-60-G	15M
Tube-NA-16#	3.1	1.6	YZ1515X YZII15 TH15 DG15-28 (48)	Norprene®A-60-G	15M
Tube-NA-73#	9.5	3.3	YZ35 YZ35-13	Norprene®A-60-G	15M
Tube-NA-16#	3.1	1.6	YZ1515X YZII15 TH15 DG15-28 (48)	Norprene®A-60-G	15M
Tube-NC-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Norprene®CHEMICAL	15M
Tube-NC-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Norprene®CHEMICAL	15M
Tube-NC-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Norprene®CHEMICAL	15M
Tube-NC-82#	12.7	3.3	YZ35 YZ35-13	Norprene®CHEMICAL	15M
Tube-TF4-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28 (48)	Tygon®F-4040-A	15M
Tube-TF4-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®F-4040-A	15M
Tube-TF4-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®F-4040-A	15M
Tube-TF4-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Tygon®F-4040-A	15M
Tube-TF4-18#	7.9	1.6	YZ1515X YZII15	Tygon®F-4040-A	15M
Tube-TF4-0.76×0.86	0.76	0.86	DG JY10 WX10 DG15-28(48)	Tygon®F-4040-A	3M
Tube-TF4-1.65×0.86	1.65	0.86	DG JY10 WX10 DG15-28(48)	Tygon®F-4040-A	3M
Tube-TF4-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Tygon®F-4040-A	15M
Tube-TF4sss-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Tygon®F-4040-A	12pc
Tube-TF5-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28 (48)	Fluran®F-5500-A	15M
Tube-TF5-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Fluran®F-5500-A	15M
Tube-TF5-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Fluran®F-5500-A	15M
Tube-TF5-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Fluran®F-5500-A	15M
Tube-TF5-18#	7.9	1.6	YZ1515X YZII15	Fluran®F-5500-A	15M
Tube-TF5-1.6×0.8	1.6	0.8	DG JY10 WX10 DG15-28(48)	Fluran®F-5500-A	15M
Tube-TF5-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Fluran®F-5500-A	10M

Model	Inner Dia. (mm)	Wall Thickness (mm)	Suitable Pump Head	Specifications	Standard Package
Tube-V-1.6×0.8	1.6	0.8	DG JY10 WX10 DG15-28(48)	viton	7.6M
Tube-V-2×1	2	1	DG JY10 WX10 DG15-28(48)	viton	5M
Tube-V-13#	0.8	1.6	YZ1515X YZII15 TH15 DG15-28(48)	viton	7.6M
Tube-V-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28(48)	viton	7.6M
Tube-V-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	viton	7.6M
Tube-V-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	viton	7.6M
Tube-V-17#	6.4	1.6	YZ1515X YZII15 DG15-24	viton	7.6M
Tube-V-18#	7.9	1.6	YZ1515X YZII15	viton	7.6M
Tube-V-15#	4.8	2.5	YZ2515X YZII25 KZ25	viton	7.6M
Tube-V-24#	6.4	2.5	YZ2515X YZII25 BZ25 KZ25	viton	7.6M
Tube-V-35#	7.9	2.5	KZ25 YZII25	viton	7.6M
Tube-V-36#	9.6	2.5	KZ25 YZII25	viton	7.6M
Tube-V-73#	9.5	3.3	KZ35 YZ35 YZ35-13	viton	7.6M
Tube-P-13#	0.8	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Pharmed®	7.6M
Tube-P-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Pharmed®	7.6M
Tube-P-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Pharmed®	7.6M
Tube-P-19#	2.4	1.6	YZ1515X YZII15 TH15	Pharmed®	7.6M
Tube-P-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Pharmed®	7.6M
Tube-P-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Pharmed®	7.6M
Tube-P-18#	7.9	1.6	YZ1515X YZII15	Pharmed®	7.6M
Tube-P-15#	4.8	2.4	YZ2515X YZII25 KZ25 DMD25	Pharmed®	7.6M
Tube-P-24#	6.4	2.4	YZ2515X YZII25 BZ25 KZ25 DMD25	Pharmed®	7.6M
Tube-P-35#	7.9	2.5	KZ25 YZII25 DMD25	Pharmed®	7.6M
Tube-P-36#	9.6	2.5	KZ25 YZII25 DMD25	Pharmed®	7.6M
Tube-P-73#	9.5	3.3	KZ35 YZ35 YZ35-13	Pharmed®	7.6M
Tube-P-82#	12.7	3.3	KZ35 YZ35 YZ35-13	Pharmed®	7.6M
Tube-P-86#	9.5	6.3	KZ48/63	Pharmed®	7.6M
Tube-P-88#	12.7	4.7	KZ48/63	Pharmed®	7.6M
Tube-P-90#	19	6.35	KZ48/63	Pharmed®	7.6M
Tube-P-92#	25.4	4.76	KZ48/63	Pharmed®	7.6M
Tube-P-0.38×0.86	0.38	0.86	DG	Pharmed®	3M
Tube-P-0.51×1.6	0.51	1.6	YZ1515X YZII15	Pharmed®	7.6M
Tube-P-0.76×0.86	0.76	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-P-1.02×0.86	1.02	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-P-1.6×0.8	1.6	0.8	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-P-1.65×0.86	1.65	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-P-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-P-2.79×0.86	2.79	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®	3M
Tube-Psss-0.38×0.9	0.38	0.9	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-0.76×0.86	0.76	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-1.02×0.86	1.02	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-1.52×0.86	1.52	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-1.65×0.86	1.65	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-2.54×0.86	2.54	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc
Tube-Psss-2.79×0.86	2.79	0.86	DG JY10 WX10 DG15-28(48)	Pharmed®sss	6pc

Model	Inner Dia. (mm)	Wall Thickness (mm)	Suitable Pump Head	Specifications	Standard Package
Tube-TR3-13#	0.8	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Tygon®R-3603	15M
Tube-TR3-14#	1.6	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Tygon®R-3603	15M
Tube-TR3-16#	3.1	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Tygon®R-3603	15M
Tube-TR3-25#	4.8	1.6	YZ1515X YZII15 TH15 DG15-28(48)	Tygon®R-3603	15M
Tube-TR3-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Tygon®R-3603	15M
Tube-TR3-18#	7.9	1.6	YZ1515X YZII15	Tygon®R-3603	15M
Tube-TR3-15#	4.8	2.5	YZ2515X YZII25 KZ25	Tygon®R-3603	15M
Tube-TR3-24#	6.4	2.5	YZ2515X YZII25 BZ25 KZ25	Tygon®R-3603	15M
Tube-TR3-0.76×0.86	0.76	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3603	10M
Tube-TR3-1.6×0.8	1.6	0.8	DG JY10 WX10 DG15-28(48)	Tygon®R-3603	10M
Tube-TR3-2.4×0.8	2.4	0.8	DG JY10 WX10 DG15-28(48)	Tygon®R-3603	10M
Tube-TR3ss-0.13×0.9	0.13	0.9	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-0.25×0.9	0.25	0.9	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-0.51×0.9	0.51	0.9	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-0.76×0.9	0.76	0.9	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-1.52×0.86	1.52	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-1.65×0.86	1.65	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3ss-1.85×0.86	1.85	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3sss-0.76×0.9	0.76	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3sss-1.52×0.86	2.54	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3sss-1.85×0.86	1.85	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-TR3sss-2.06×0.86	2.06	0.86	DG JY10 WX10 DG15-28(48)	Tygon®R-3607ss	12pc
Tube-T3-19#	2.4	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®3350	15M
Tube-T3-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®3350	15M
Tube-T3-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®3350	15M
Tube-T3-18#	7.9	1.6	YZ1515X YZII15	Tygon®3350	15M
Tube-T3-15#	4.8	2.5	YZ2515X YZII25 KZ25	Tygon®3350	15M
Tube-T3-24#	6.4	2.5	YZ2515X YZII25 BZ25 KZ25	Tygon®3350	15M
Tube-T2-16#	3.1	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®2275	15M
Tube-T2-25#	4.8	1.6	YZ1515X YZII15 DG15-24 TH15	Tygon®2275	15M
Tube-T2-17#	6.4	1.6	YZ1515X YZII15 DG15-24	Tygon®2275	15M
Tube-T2-82#	12.7	3.3	KZ35 YZ35 YZ35-13	Tygon®2275	15M
Tube-DM-24#	6.4	2.5	YZ2515X YZII25 BZ25 KZ25 DMD25	Double Marprene	5pc
Tube-MHLLss-2.79×0.86	2.79	0.86	DG JY10 WX10 DG15-28(48)	MHLLss	6pc

Micro & Small Flow Tubing:

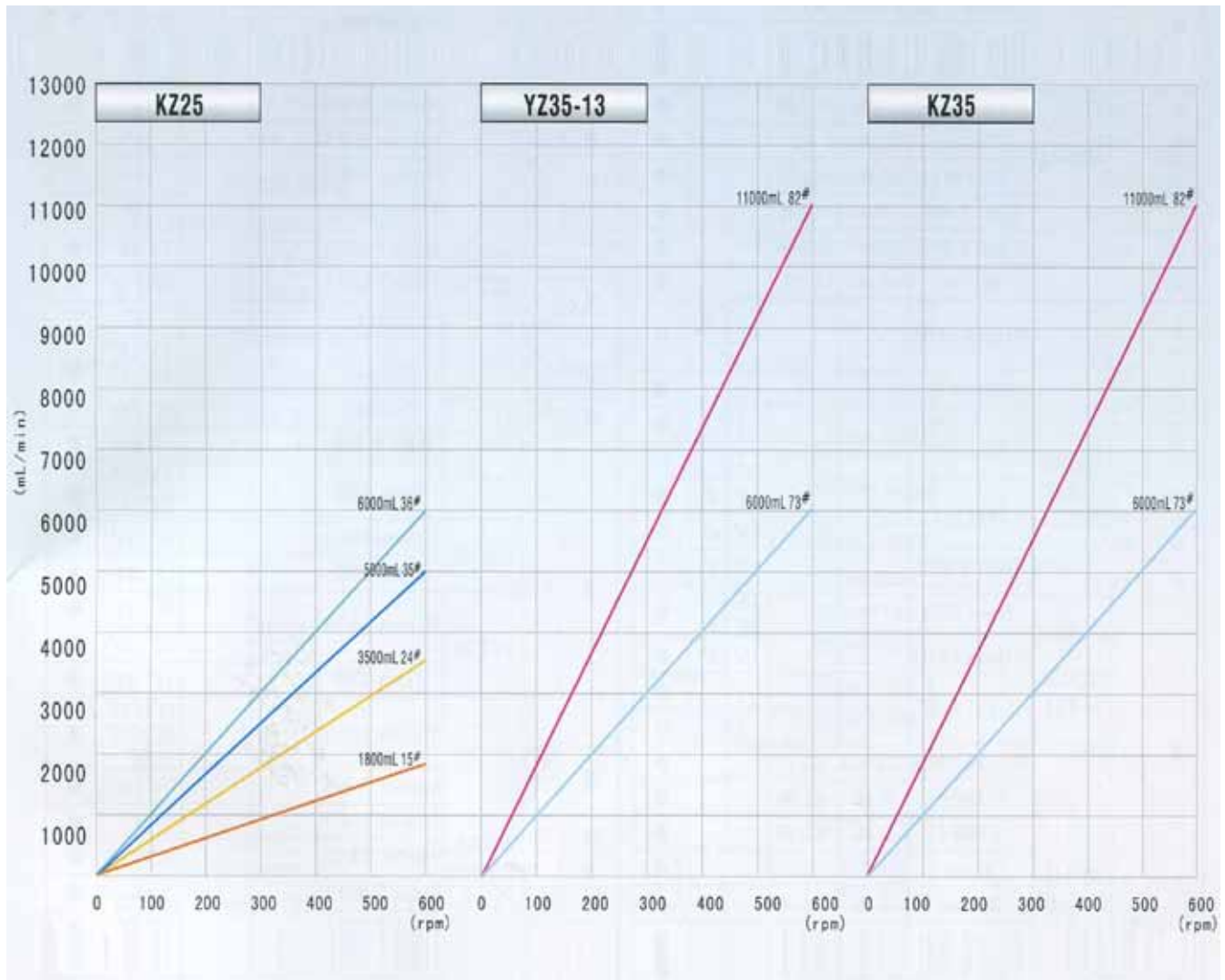


Medium Flow Tubing:

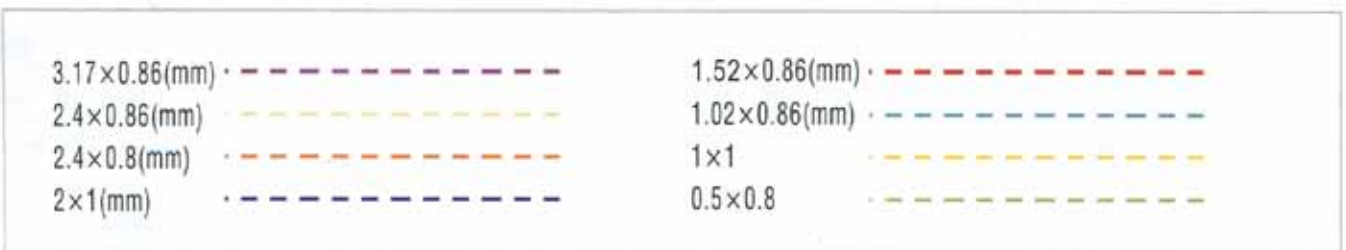


# P PERISTALTIC PUMPS Tubing Ref. Flow Rates Curve

## Industrial Tubing:



Note: Different colorful lines represent different type of tubing





Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark	
PP-X-20	YZ1014	Silicone tubing	0.8-1.0	≤3.17		•	
		Tygon F-4040-A	0.86	≤2.06		•	
		Fluran F-5500-A	0.86	≤2.06		•	
		Viton	1.0	≤2		•	
		Pharmed	0.86	≤2.79		•	
		Tygon R-3603	0.8	≤2.4		•	
		Tygon R-3607	0.86	≤2.06		•	
		MHLLSs	0.86	≤2.79		•	
PP-X-380	YZ1515x YZ1115	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•	
		Norprene A-60-G			14#	•	
		Fluran F-5500-A			14#	•	
		Pharmed			16#	○	
		Tygon R-3603			13# 14#	•	
		Tygon 3350			19# 16# 25# 18#	○	
		Tygon 3350			19# 16# 25# 18#	•	
		Tygon 3350			19# 16# 25# 18#	•	
	YZ2515x YZ1125	Silicone tubing			15# 24#	•	
		Tygon 3350			15#	•	
		Tygon 3350			24#	○	
		Tygon 3350			24#	○	
	DG-1 (6) DG-1 (10)	Silicone tubing	0.8-1.0	≤3.17		•	
		F-4040-A	0.86	≤2.06		•	
		F-5500-A	0.86	≤2.06		•	
		Viton	0.8-1.0	≤2		•	
		Pharmed	0.86	≤2.79		•	
		Tygon R-3603	0.8	≤2.4		•	
		Tygon R-3607	0.9	≤2.06		•	
		MHLLSs	0.86	≤2.79		•	
		DG-2 (6)	Silicone tubing	0.8-1.0	≤3.17		•
			F-4040-A	0.86	≤2.06		○
			F-5500-A	0.86	≤2.06		•
			Viton	0.8-1.0	≤2		•
Pharmed			0.86	≤2.79		•	
Tygon R-3603			0.8	≤2.4		•	
Tygon R-3607			0.9	≤2.06		•	
Tygon R-3607			0.9	≤2.06		•	
DG-2 (10)	Silicone tubing	0.8-1.0	≤3.17		•		
	F-5500-A	0.86	≤2.06		•		
	Viton	0.8-1.0	≤2		•		
	Pharmed	0.86	≤2.79		•		
	Tygon R-3603	0.8	≤2.4		•		
	Tygon R-3607	0.9	≤2.06		•		
	Tygon R-3607	0.9	≤2.06		•		
	Tygon R-3607	0.9	≤2.06		•		
PP-X-2200	YZ1515x YZ1115	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•	
		Norprene A-60-G			14#	•	
		Fluran F-5500-A			14#	•	
		Pharmed			16#	○	
		Pharmed			13# 14#	•	
		Tygon R-3603			19# 16#	○	
		Tygon 3350			13# 14#	○	
		Tygon 3350			19# 16# 25# 18#	•	
	YZ2515x YZ1125	Silicone tubing			15# 24#	•	
		Tygon 3350			15#	•	
		Tygon 3350			24#	○	
		Tygon 3350			24#	○	
PP-X-1600	Silicone tubing				13# 14# 19# 16# 25# 17# 18#	•	

Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark	
PP-X-1600	YZ1515x YZ1115	Norprene A-60-G			14#	•	
		Norprene A-60-G			16#	○	
		Norprene A-60-F			16#	○	
		Norprene CHEMICAL			16#	•	
		Fluran F-5500-A			14# 16#	•	
		Fluran F-5500-A			25# 17# 18#	○	
		Viton			16#	○	
		Pharmed			13# 14# 19# 16#	•	
		Pharmed			25# 17# 18#	○	
		Tygon R-3603			14#	•	
		Tygon 3350			19# 16# 25# 18#	•	
		YZ2515x	Silicone tubing			15# 24#	•
	Tygon 3350				15# 24#	•	
	YZ1125		Silicone tubing			15# 24#	•
			Tygon 3350			35# 36#	○
	YZ1515x X1 YZ1115 X1	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•	
		Norprene A-60-G			14# 16#	•	
		Norprene A-60-F			16#	•	
		Norprene CHEMICAL			16# 25# 17#	•	
		Fluran F-4040-A			14# 16# 25# 17# 18#	•	
		Fluran F-5000-A			17# 18#	•	
		Viton			13# 14# 19# 16# 25# 17# 18#	•	
		YZ1515x X2 YZ1115 X2	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•
			Norprene A-60-G			14# 16#	•
Norprene A-60-F					16#	•	
Norprene CHEMICAL					16#	•	
Norprene CHEMICAL					25#	○	
Fluran F-4040-A				14#	•		
Fluran F-4040-A				16#	○		
Fluran F-5500-A				14# 16# 25# 17# 18#	•		
Viton				13# 14# 16#	•		
Viton				25# 17# 18#	○		
Viton				13# 14# 19# 16# 25# 17# 18#	•		
PP-X-6000	YZ1515x X2 YZ1115 X2		Tygon R-3603			13# 14# 16#	•
		Norprene A-60-G			14# 16#	•	
		Norprene A-60-F			16#	•	
		Norprene CHEMICAL			16#	•	
		Norprene CHEMICAL			25#	○	
		Fluran F-4040-A			14#	•	
		Fluran F-4040-A			16#	○	
		Fluran F-5500-A			14# 16# 25# 17# 18#	•	
	YZ2515x X1	Silicone tubing			13# 14# 16#	•	
		Pharmed			25# 17# 18#	○	
		Pharmed			13# 14# 19# 16# 25# 17# 18#	•	
		Tygon R-3603			13# 14# 16#	•	
YZ2515x X2	Tygon R-3603			25# 17# 18#	○		
	Tygon 3350			19# 16# 25# 18#	•		
	Tygon 2275			16# 25# 17#	○		
	Silicone tubing			15# 24#	•		
	Pharmed			15# 24#	•		
	Tygon R-3603			15# 24#	•		
	Tygon 3350			15# 24#	•		
	Tygon 3350			15# 24#	•		
YZ1125 X1	Silicone tubing			15# 24#	•		
	Pharmed			35# 36#	•		
	Tygon R-3603			15# 24#	•		
	Tygon 3350			15# 24#	•		
	YZ2515x X2	Silicone tubing			15# 24#	•	
		Pharmed			15# 24#	○	
		Tygon R-3603			15# 24#	○	
		Tygon 3350			15# 24#	•	
YZ1125 X2	Silicone tubing			15# 24# 35# 36#	•		
	Pharmed			15# 24#	○		
	Tygon R-3603			15# 24#	○		
	Tygon 3350			15# 24#	•		

# PERISTALTIC PUMPS Configuration Table

Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark	
PP-X-6000	KZ25	Silicone tubing			15# 24# 35# 36#	•	
		Tygon R-3603			15# 24#	•	
		Tygon 3350			15# 24#	•	
		Tygon 2275			15# 24#	•	
	DG15-24	Silicone tubing			16# 25# 17#	•	
		Norprene CHEMICAL					
		Fluran F-4040-A					
		Fluran F-5500-A					
		Viton					
		Pharmed					
		Tygon R-3603					
		Tygon 3350					
	PP-W-6000	YZ1515x X1 YZ115 X1	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•
			Norprene A-60-G			14# 16#	•
Norprene A-60-F					16#	•	
Norprene CHEMICAL					16# 25# 17#	•	
Fluran F-4040-A					13# 14# 19# 16# 25# 17# 18#	•	
Fluran F-5500-A							
Viton							
Pharmed							
Tygon R-3603						•	
Tygon 3350					19# 16# 25# 18#	•	
Tygon 2275				16# 25# 17#	•		
YZ1515x X2 YZ115 X2		Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•	
		Norprene A-60-G			14# 16#	•	
		Norprene A-60-F			16#	•	
	Norprene CHEMICAL			16#	•		
	Fluran F-4040-A			25#	○		
	Fluran F-4040-A			14#	•		
	Fluran F-4040-A			16#	○		
	Fluran F-5500-A			14# 16# 25# 17# 18#	•		
	Viton			13# 14# 16#	•		
	Viton			25# 17# 18#	○		
	Pharmed			13# 14# 19# 16# 25# 17# 18#	•		
	Tygon R-3603			13# 14# 16#	•		
	Tygon R-3603			25# 17# 18#	○		
	Tygon 3350			19# 16# 25# 18#	•		
Tygon 2275			16# 25# 17#	○			
YZ2515x X1	Silicone tubing			15# 24#	•		
	Pharmed			15# 24#	•		
	Tygon R-3603			15# 24#	•		
	Tygon 3350			15# 24#	•		
	Tygon 2275			15# 24#	•		

Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark	
PP-W-6000	YZ1125 X1	Silicone tubing			15# 24# 35# 36#	•	
		Pharmed			15# 24#	•	
		Tygon R-3603			15# 24#	•	
		Tygon 3350			15# 24#	•	
	YZ2515x X2 YZ1125 X2	Silicone tubing			15# 24#	•	
		Pharmed			15# 24#	○	
		Tygon R-3603			15# 24#	○	
		Tygon 3350			15# 24#	•	
	YZ2515x X2 YZ1125 X2	Silicone tubing			15# 24# 35# 36#	•	
		Pharmed			15# 24#	○	
		Tygon R-3603			15# 24#	○	
		Tygon 3350			15# 24#	•	
	KZ25	Silicone tubing			15# 24# 35# 36#	•	
		Tygon R-3603			15# 24#	•	
		Tygon 3350			15# 24#	•	
		Tygon 2275			15# 24#	•	
	DG15-24	Silicone tubing			16# 25# 17#	•	
		Norprene CHEMICAL					
		Fluran F-4040-A					
		Fluran F-5500-A					
		Viton					
		Pharmed					
		Tygon R-3603					
		Tygon 3350					
Tygon 2275							
Tygon 2275							
PP-F-500	YZ1515x YZ1115	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•	
		Norprene A-60-G			14#	•	
		Norprene A-60-G			16#	○	
		Norprene A-60-F			16#	○	
		Norprene CHEMICAL			16#	○	
		Fluran F-5500-A			14# 16#	•	
		Fluran F-5500-A			25# 17# 18#	○	
		Viton			16#	○	
		Pharmed			13# 14# 19# 16#	•	
		Pharmed			25# 17# 18#	○	
		Tygon R-3603			14#	•	
		Tygon 3350			19# 16# 25# 18#	•	
		YZ2515x	Silicone tubing			15# 24#	•
			Tygon 3350			15# 24#	•
	Silicone tubing				15# 24#	•	
	Tygon 3350				15# 24#	•	
	YZ1125	Silicone tubing			35# 36#	○	
		Tygon 3350			15# 24#	•	
		Silicone tubing			15# 24#	•	
		Tygon 3350			15# 24#	•	
	DG-1 (6) DG-1 (10)	Silicone tubing	0.8-1.0	≤3.17		•	
		F-4040-A	0.86	≤2.06		•	
		F-5500-A	0.86	≤2.06		•	
		Viton	0.8-1.0	≤2		•	
Pharmed		0.86	2.79		•		
Tygon R-3603		0.8	≤2.4		•		
Tygon R-3607		0.9	≤2.06		•		
MHLLs		0.86	2.79		•		
Silicone tubing		0.8-1.0	≤3.17		•		
F-4040-A		0.86	≤2.06		○		
DG-2 (6)	F-5500-A	0.86	≤2.06		•		
	Viton	0.8-1.0	≤2		•		
	Pharmed	0.86	2.79		•		
	Tygon R-3603	0.8	≤2.4		•		
	Tygon R-3607	0.9	≤2.06		•		
	Tygon R-3607	0.9	≤2.06		•		

Drive	Pump Head	Tubing						
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark		
PP-F-500	DG-2 (10)	Silicone tubing	0.8-1.0	≤3.17		●		
		F-4040-A	0.86	≤2.06		○		
		F-5500-A	0.86	≤2.06		●		
		Viton	0.8-1.0	≤2		●		
		Pharmed	0.86	2.79		●		
		Tygon R-3603	0.8	2.79		●		
	Tygon R-3607	0.9	≤2.06		●			
	DG-4 (6)	Silicone tubing	0.8-1.0	≤3.17		●		
		F-5500-A	0.86	≤2.06		●		
		Pharmed	0.86	≤2.06		●		
		Pharmed	0.86	2.79		○		
		Tygon R-3603	0.8	≤1.6		●		
		Tygon R-3603	0.8	2.4		○		
	Tygon R-3607	0.9	≤2.06		●			
	DG-4 (10)	Silicone tubing	0.8-1.0	≤3.17		●		
		Pharmed	0.86	≤2.06		●		
		Pharmed	0.86	2.79		○		
		Tygon R-3603	0.8	≤1.6		●		
		Tygon R-3603	0.8	2.4		○		
		Tygon R-3607	0.9	≤2.06		●		
	PP-F-1140	YZ1515x YZ115	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●	
Norprene A-60-G					14#	●		
Fluran F-5500-A					14#	●		
Fluran F-5500-A					16#	○		
Pharmed					13# 14#	●		
Pharmed					19# 16#	○		
Tygon R-3603					13# 14#	○		
Tygon 3350				19# 16# 25# 18#	●			
YZ2515x YZ1125		Silicone tubing			15# 24#	●		
		Tygon 3350			15#	●		
		Tygon 3350			24#	○		
		PP-F-6000	YZ1515x X1 YZ115 X1	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●
				Norprene A-60-G			14# 16#	●
				Norprene A-60-F			16#	●
	Norprene CHEMICAL					16# 25#	●	
Fluran F-4040-A					14# 16# 25# 17# 18#	●		
Fluran F-5500-A					14# 16# 25# 17# 18#	●		
Viton					13# 14# 16# 25# 17# 18#	●		
Pharmed					13# 14# 19# 16# 25# 17# 18#	●		
Tygon R-3603					13# 14# 16# 25# 17# 18#	●		
Tygon 3350					19# 16# 25# 18#	●		
Tygon 2275			16# 25# 18#	●				
YZ1515x X2 YZ115 X2	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●			
	Norprene A-60-G			14#	●			
	Fluran F-5500-A			14#	●			
	Fluran F-5500-A			16# 25#	○			
	Pharmed			13# 14#	●			
	Pharmed			19# 16#	○			
	Tygon R-3603			13# 14#	○			
	Tygon 3350			19# 16# 25# 18#	●			
	PP-F-6000	YZ1515x X1 YZ115 X1	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●	
			Norprene A-60-G			14# 16#	●	
Norprene A-60-F					16#	●		
Norprene CHEMICAL					16# 25# 17#	○		
Fluran F-4040-A					14# 16# 25# 17# 18#	●		
Fluran F-5500-A					14# 16# 25# 17# 18#	●		
Viton					13# 14# 16# 25# 17# 18#	●		
Pharmed					13# 14# 19# 16# 25# 17# 18#	●		
Tygon 3350					19# 16# 25# 18#	●		
Tygon 2275					16# 25# 17#	●		
YZ1515x X2 YZ115 X2	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●			
	Norprene A-60-G			14#	●			
	Fluran F-5500-A			14#	●			
	Fluran F-5500-A			16# 25#	○			
	Pharmed			13# 14#	●			
	Pharmed			19# 16#	○			
	Tygon R-3603			13# 14#	○			
	Tygon 3350			19# 16# 25# 18#	●			
	Tygon 2275			16# 25# 17#	●			

Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark	
PP-F-6000	YZ2515x X1	Silicone tubing			15# 24#	●	
		Pharmed			15# 24#	●	
		Tygon R-3603			15# 24#	●	
		Tygon 3350			15# 24#	●	
		Tygon 3350			15# 24#	●	
	YZ1125x X1	Silicone tubing			15# 24# 35# 36#	●	
		Pharmed			15# 24#	●	
		Tygon R-3603			15# 24#	●	
	YZ2515x X2 YZ1125 X2	Silicone tubing			15# 24#	●	
		Tygon 3350			15# 24#	●	
	KZ25	Silicone tubing			15# 24#	●	
		Silicone tubing			35# 36#	○	
		Pharmed			15# 24#	○	
	PP-F-11L	YZ35-13 KZ35	Silicone tubing			73# 82#	●
			Pharmed			73# 82#	○
		YZ35-13 X2 KZ35 X2	Silicone tubing			73#	●
			Silicone tubing			82#	○
	PP-X-11L	YZ35-13 KZ35	Silicone tubing			73# 82#	●
Pharmed					73# 82#	○	
YZ35-13 X2 KZ35 X2		Silicone tubing			73#	●	
		Silicone tubing			82#	○	
PP-L-500	YZ1515x X1 YZ115x X1	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●	
		Norprene A-60-G			14# 16#	●	
		Norprene A-60-F			16#	●	
		Norprene CHEMICAL			16# 25# 17#	●	
		Fluran F-4040-A			14# 16# 25# 17# 18#	●	
		Fluran F-5500-A			14# 16# 25# 17# 18#	●	
		Viton			13# 14# 16# 25# 17# 18#	●	
		Pharmed			13# 14# 19# 16# 25# 17# 18#	●	
		Tygon 3350			19# 16# 25# 18#	●	
		Tygon 2275			16# 25# 17#	●	
	YZ1515x X2 YZ115x X2	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	●	
		Norprene A-60-G			14# 16#	●	
		Norprene A-60-F			16#	●	
		Norprene CHEMICAL			16# 25# 17#	○	
		Fluran F-4040-A			14# 16# 25# 17# 18#	●	
		Fluran F-5500-A			14# 16# 25# 17# 18#	●	
		Viton			13# 14# 16# 25# 17# 18#	●	
		Pharmed			13# 14# 19# 16# 25# 17# 18#	●	
		Tygon R-3603			13# 14# 16# 25# 17# 18#	●	
		Tygon 3350			19# 16# 25# 18#	●	
Tygon 2275			16# 25# 17#	●			

# PERISTALTIC PUMPS Configuration Table

Drive	Pump Head	Tubing				
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Remark
PP-L-500	YZ1515x X3 YZ115 X3	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•
		Norprene A-60-G			14#	•
		Norprene A-60-G			16#	○
		Norprene A-60-F			16#	○
		Norprene CHEMICAL			16#	○
		Fluran F-4040-A			14# 16#	•
		Fluran F-5500-A			25# 17# 36#	○
		Viton			13#	•
		Viton			14#	○
		Pharmed			13# 14# 19# 16#	•
		Tygon R-3603			13# 14#	•
		Tygon 3350			19# 16# 25# 18#	•
	YZ1515x X4 YZ115 X4	Silicone tubing			13# 14# 19# 16# 25# 17# 18#	•
		Norprene A-60-G			14#	•
		Fluran F-5500-A			14# 16#	○
		Viton			13#	•
		Pharmed			13# 14#	•
		Tygon R-3603			13#	•
	YZ2515x X1	Silicone tubing			15# 24#	•
		Pharmed			15# 24#	•
		Tygon R-3603			15# 24#	•
		Tygon 3350			15# 24#	•
	YZ1125 X1	Silicone tubing			15# 24# 35# 36#	•
		Pharmed			15# 24#	•
		Tygon R-3603			15# 24#	•
	YZ2515x X2	Silicone tubing			15# 24#	•
		Pharmed			15# 24#	○
		Tygon R-3603			15# 24#	○
	YZ2515x X3	Silicone tubing			15# 24#	•
		Pharmed			15# 24#	•
		Tygon R-3603			15# 24#	•
	YZ2515x X4	Silicone tubing			15# 24#	•
		Pharmed			15# 24#	○
		Tygon R-3603			15# 24#	○
	YZ1125x X2	Silicone tubing			15# 24# 35# 36#	•
		Pharmed			15# 24#	○
		Tygon R-3603			15# 24#	○
	DG15-24	Silicone tubing			16# 25# 17#	•
		Norprene CHEMICAL				•
		Fluran F-4040-A				•
		Fluran F-5500-A				•
		Viton				•
Pharmed					○	
Tygon R-3603					•	
Tygon 3350					○	
Tygon 2275					•	

Drive	Pump Head	Tubing					
		Type	Wall Thickness (mm)	ID (mm)	Tubing Number	Re-mark	
PP-L-500	DG15-28	Silicone tubing	0.8-1.0	≤3.17	13# 14#	•	
		Norprene A-60-G			14#	•	
		Norprene A-60-G			17#	○	
		Pharmed	0.86	≤2.79	13# 14#	•	
		Tygon R-3603	0.8	≤2.4	13# 14#	•	
		F-4040-A	0.86	≤2.06		•	
		F-5500-A	0.86	≤2.06		•	
		Viton	0.8-1.0	≤2		•	
		Tygon R-3607	0.9	≤2.06		•	
		DG15-48	Silicone tubing	0.8-1.0	≤2	13# 14#	• ○
			F-4040-A	0.86	≤1.65		•
			F-5500-A	0.86	≤1.6		•
	Viton		0.8-1.0	≤2		○	
	Pharmed		0.86	<2.54		•	
	Pharmed		0.86	2.54 2.79		○	
	Tygon R-3603		0.8	≤2.4		•	
	Tygon R-3607		0.9	<2.06		•	
	DG-2/4/ 6/8/12 (6/10 rollers)		Silicone tubing	0.8-1.0	≤3.17		•
			F-4040-A	0.86	≤2.06		•
		F-5500-A	0.86	≤2.06		•	
		Viton	0.8-1.0	≤2		•	
		Pharmed	0.86	≤2.79		•	
		Tygon R-3603	0.8	≤2.4		•	
		Tygon R-3607	0.9	≤2.06		•	
		DG-16 (6)	Silicone tubing	0.8-1.0	≤3.17		•
			F-5500-A	0.86	1.6		•
			Pharmed	0.86	≤2.06		•
	Pharmed		0.86	2.54		○	
	Tygon R-3603		0.8	≤0.76		•	
	Tygon R-3603		0.8	≥0.76		○	
	Tygon R-3607		0.9	≤1.85		•	
	Tygon R-3607		0.9	2.06		○	
	DG-16 (10)		Silicone tubing	0.8-1.0	<3		•
			Silicone tubing	1.0	3		○
		F-5500-A	0.86	1.6		○	
		Pharmed	0.86	≤1.65		•	
		Pharmed	0.86	>1.65		○	
		Tygon R-3603	0.8	≥0.76		○	
		Tygon R-3603	0.8	<0.76		•	
		Tygon R-3607	0.9	<1.85		•	
		Tygon R-3607	0.9	≥1.85		○	
		DG-24 (6)	Silicone tubing	0.8-1.0	≤3.17		•
Pharmed			0.86	≤1.65		•	
DG-24 (10)		Silicone tubing	0.8-1.0	<2		•	
		Pharmed	0.86	≤1.65		○	
PP-F-380		LEAD15-24			16# 25# 17#	•	
	LEAD15-44			16#	•		
	LEAD15-48			13# 14#	•		
	LEAD15-88			13# 14#	• ○		

**Note:** • Means Good  
○ Means Fair

**Dispensing Controller**

**Function and Feature:**

Dispensing controller can be equipped with many peristaltic pumps to realize dispensing automatically.



**Standard External Control Interface**

**Applicable Drive Types:**

- PP-X-20
- PP-X-380
- PP-X-2200
- PP-X-1600
- PP-F-380
- PP-L-500
- PP-F-500
- PP-F-1140
- PP-X-6000
- PP-F-6000

**Five Kinds of Control Modes:**

- 149-1-000011 - 0-5V analog input
- 149-1-000010 - 0-10V analog input
- 149-1-000009 - 4-20mA analog input
- 149-1-000012 - 0-10kHz Pulse Input
- 149-1-000008 - Communication control (RS485).

**Note:** Please see above picture for part numbers

**Footswitch**



Model	Connector	Applicable Products
149-1-000021	DB-9	Peristaltic Pump
149-1-000022	DB-9	Dispensing Controller
149-1-000023	DB-15	Peristaltic Pump
149-1-000024	DB-9	LSP Series Syringe Pump (the PCB board of the pump needs to be modified)
149-1-000025	DB-15	TJ Series Syringe Pump
149-1-000026	None	TS Series Syringe Pump

**Footswitch Working Modes:**

Model	Applicable Products
149-1-000021	1. Gated: Connect the footswitch to the pump. The pump stops after power up. The pump runs as long as the footswitch is pressed. 2. Trigger: Connect the footswitch to the pump. The pump stops after power up. Press footswitch, the pump starts running. Press footswitch again, the pump stops.
149-1-000022	Trigger: Press the footswitch one time, dispensing controller FK-1C starts running according to the set running time. When the set running time is out, FK-1 C stops.
149-1-000023	Gated: The pump runs as long as the footswitch is pressed.
149-1-000024	1. Gated: Connect the footswitch to the pump. The pump stops after power up. The pump runs as long as the footswitch is pressed. 2. Trigger: Connect the footswitch to the pump. The pump stops after power up. Press footswitch, the pump starts running. Press footswitch again, the pump stops.
149-1-000025	Trigger: Connect the footswitch to the pump. The pump stops after power up. Press footswitch, the pump starts running. Press footswitch again, the pump stops.
149-1-000026	Trigger: Connect the footswitch to the pump. The pump stops after power up. Press footswitch, the pump starts running. Press footswitch again, the pump stops.

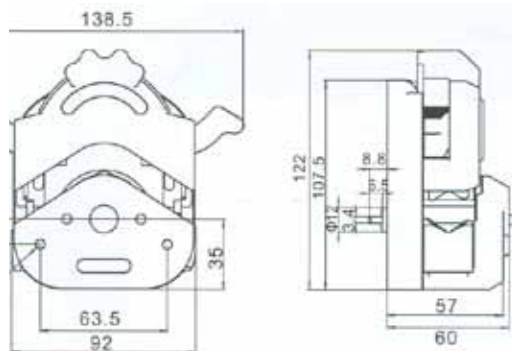
# P PERISTALTIC PUMPS Easy-Load Pump Heads



PESU

## YZII15/YZII25

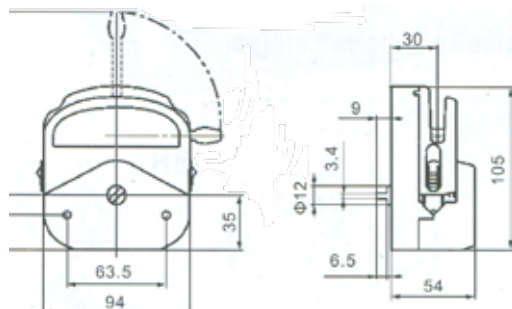
Change tubing easily and rapidly; Compact size. The tubing retention set is a linkage, It is convenient to load the tubing; Accept several tubing sizes for a wide flow range; The rollers adopt high quality materials and has good wearing property; The housing material is PESU. It has perfect rigidity and structure property. It is stable and autoclavable (200°C).



PESU

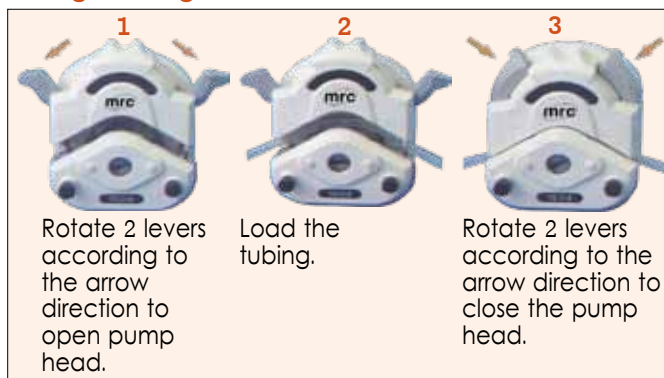
## YZ1515x/YZ2515x

Change tubing easily and rapidly; Automatic tubing retention; Suitable for several tubing sizes; The rollers adopt high quality materials and has good wearing property; The housing of the pump head has perfect rigidity and structure property, and its materials are PESU or PPS which are stable and autoclavable (200°C).



PPS

## Tubing Loading Procedure:



Model	Max. Flow Rates (mL/min)	Speed (rpm)	Housing Material	Rollers Material	Rollers Quantity	Tubing	Weight (Kg)
YZ1515x	2200	≤600	PESU/PPS	SS	3	13# 14# 19# 16# 25# 17# 18#	0.4
YZ2515x	1600		PESU/PPS			15# 24#	
YZII15	2200		PESU			13# 14# 19# 16# 25# 17# 18#	0.35
YZII25	3000		PESU			15# 24# 35# 36#	

050525x, Standard External Control Interface

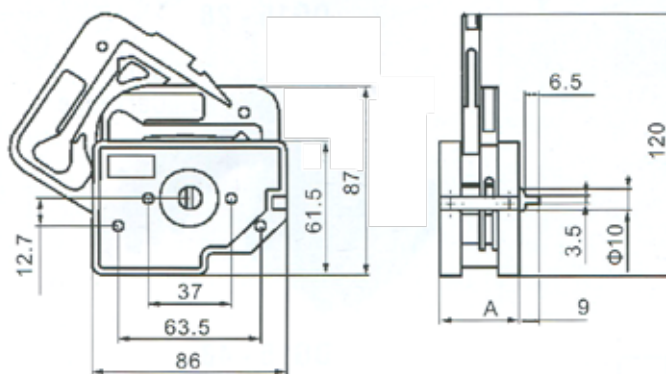


**Introduction:**

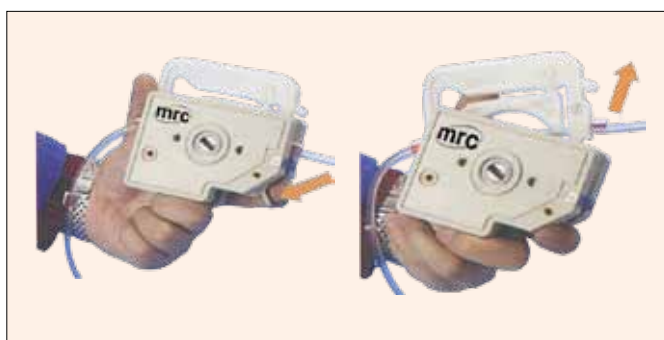
DG Series pump heads are designed for small flow rates, multi-channel fluids transfer. Easy to change and fix the tubing. Occlusion can be adjusted slightly. The rollers adopt high quality materials. The pump head consists of base, rotor assembly and easily dismantled cartridge.

**Features:**

- Multi-channel transfer
- Change tubing easily
- Fix tubing easily
- Occlusion can be adjusted slightly by ratchet wheel to meet different tubing wall thickness requirements
- 6-roller and 10-roller pump heads available
- More rollers reduce pulsation and flow rates slightly
- Skillful trigger design, convenient to open the cartridges (DG-1, DG-2)
- Rollers adopt 316 stainless steel which has chemical resistance to organic solution, acid and alkali.



**DG-1, DG-2 Trigger Operation:**



Model	Max. Flow Rates (mL/min)		Speed (rpm)	Cartridge Material	Tubing	Weight (Kg)	
	6 Rollers	10 Rollers				6 Rollers	10 Rollers
DG-1	48 (per channel)	32 (per channel)	≤100	POM/ PVDF	Inner Diameter ≤3.17 mm Wall Thickness 0.8-1 (rmm)	0.21	0.20
DG-2						0.27	0.26
DG-4						0.40	0.39
DG-6						0.54	0.51
DG-8						0.67	0.63
DG-12						0.95	0.88

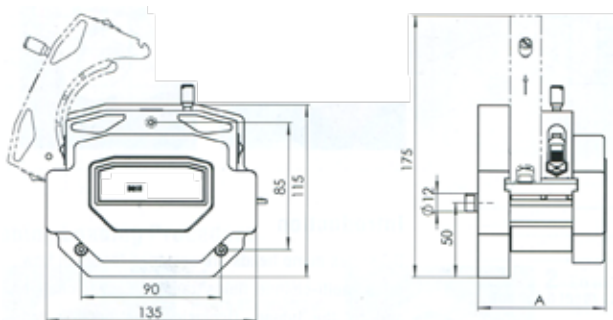
# P PERISTALTIC PUMPS Medium & Small Flow Rates Multi-channel Pump Heads



DG15

### Features:

- Cartridges and base can be separated. It's convenient to load the tubing
- Suitable for several tubing sizes for a wide flow range
- Occlusion can be adjusted slightly to meet different tubing wall thickness requirements
- The material of the roller is stainless steel
- The material of the cartridge working surface is POM. It has perfect self lubricating property to reduce tubing wear abrasion.



### DG15-24/DG15-28/DG15-48, Multi-Channel

DG15 Series pump heads are designed for medium and small flow rates, multi-channel fluids transfer. Easy to change and fix the tubing. Occlusion can be adjusted slightly. The rollers adopt high quality materials. The pump head consists of base, rotor assembly and easy-to-load cartridges.

### Pump Head Type:



DG15 - 24: 2 Channels 4 Rollers  
 DG15 - 28: 2 Channels 8 Rollers  
 DG 15 - 48: 4 Channels 8 Rollers

Model	Max. Flow Rates (mL/min)	Speed (rpm)	Cartridge Material	Rollers Material	Rollers Quantity	Tubing	Weight (Kg)
DG15-24	1800	≤600	PESU/PPS	SS	4	16# 25# 17#	0.82
DG15-28	75	≤100	PESU/PPS		8	Inner Diameter ≤3.17mm Wall Thickness 0.8 - 1 (mm) 13# 14#	0.67
DG15-48			PESU				0.87

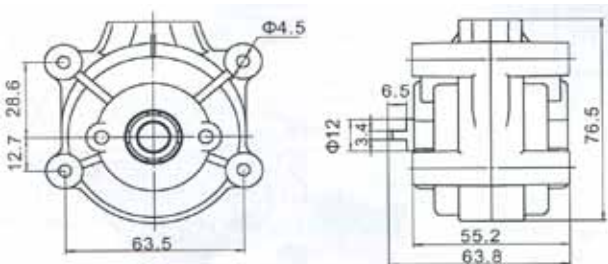


**BZ25**



**Features:**

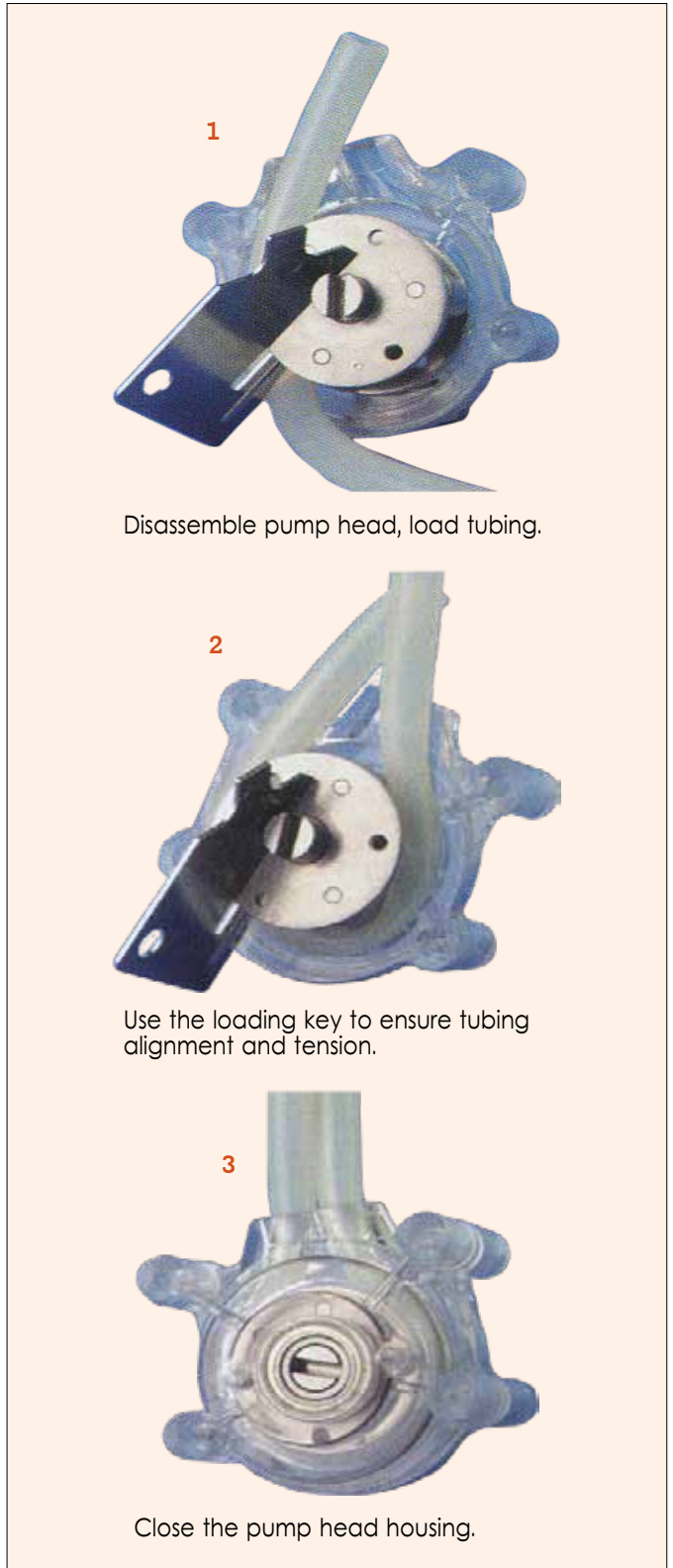
- Stable operation and stackable
- Compact size
- Dismounting the pump head from the drive is needed when loading the tubing
- Standard pump head, fixed occlusion
- Ideal for OEM.



**BZ25,**

Stainless steel or high performance plastic rollers available. Transparent PC housing, visible operation.

**Tubing Loading Procedure:**



Disassemble pump head, load tubing.

Use the loading key to ensure tubing alignment and tension.

Close the pump head housing.

Model	Max. Flow Rates (mL/min)	Speed (rpm)	Housing Material	Rollers Quantity	Tubing	Weight (Kg)
BZ25	1600	≤600	PC	3	24#	0.31

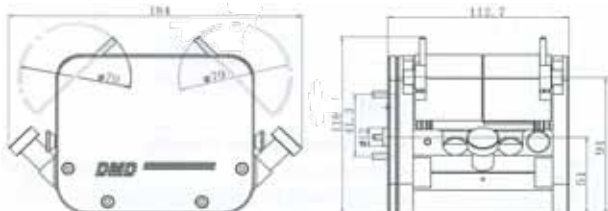
# P PERISTALTIC PUMPS Low Pulse Pump Heads



DMD25

### Features:

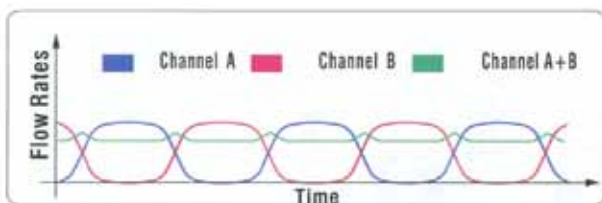
- Suitable for accurate liquid dispensing
- Track assembly and base are separated. Easy to load tubing
- Accept many sizes of tubing to realize wide range flow rates transferring
- Twin offset track combing with Double-Y tube elements reduce the pulsation successfully. The accuracy can reach  $\pm 0.5\%$
- Hay cutter style fixing prevents the tubing from quick abrasion caused by shock
- Front rear support plate and the compression block adopt hard anodized aluminum alloy.



### Shaft Type:

- Long Shaft (for single pump head)
- Long Shaft (for stack, connect drive directly)
- Short Shaft (for stack).

### Pulsation Reducing:



### DMD25, Low Pulse Pump Head

DMD25 pump head is designed for high accuracy dispensing. Twin offset track design and Double-Y tubing ensure the high dispensing accuracy. Hay cutter style retainer prevents the tubing from quick abrasion caused by shock. The pump head adopts stainless steel, aluminum and POM materials. The performance is reliable and stable. It is ideal for industry application.

### Tubing Loading Procedure:

- 1 Lift the two levers at both sides of the pump head and remove the track.
- 2 Loose the knobs, open the hay cutter style fixing by turning it through one quarter turn. Put the Double-Y tubing on the rollers and locate it over the mushroom pegs on both sides of the pump head.
- 3 Close the hay cutter style fixing. Tighten the knobs on both sides of the pump head.
- 4 Replace the track and secure it by closing the two levers.



Twin offset tracks reduce the pulsation, increase the dispensing accuracy.

Model	Max. Flow Rates (mL/min)	Speed (rpm)	Rollers Quantity	Rollers Material	Track Material	Tubing	Weight (Kg)
DMD25	150	≤350	6	SS	POM	119#	2.5
	800					120#	
	1500					15#	
	2400				Aluminum Alloy	24#	3.0
	2950					35#	
	4000					36#	

**KZ25**



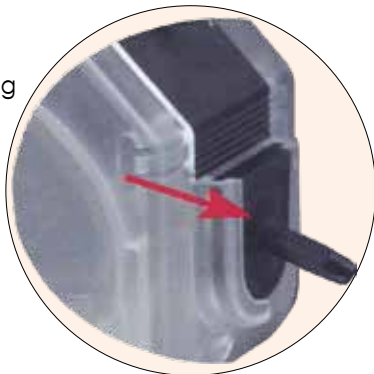
**Features:**

- Cartridges and base can be separated. It's convenient to load the tubing
- Pump heads can be stackable
- Compact size and a wide flow range
- Ideal for OEM.

**Shaft Type:**

- Long Shaft (for stack, connect drive directly)
- Short Shaft (for stack).

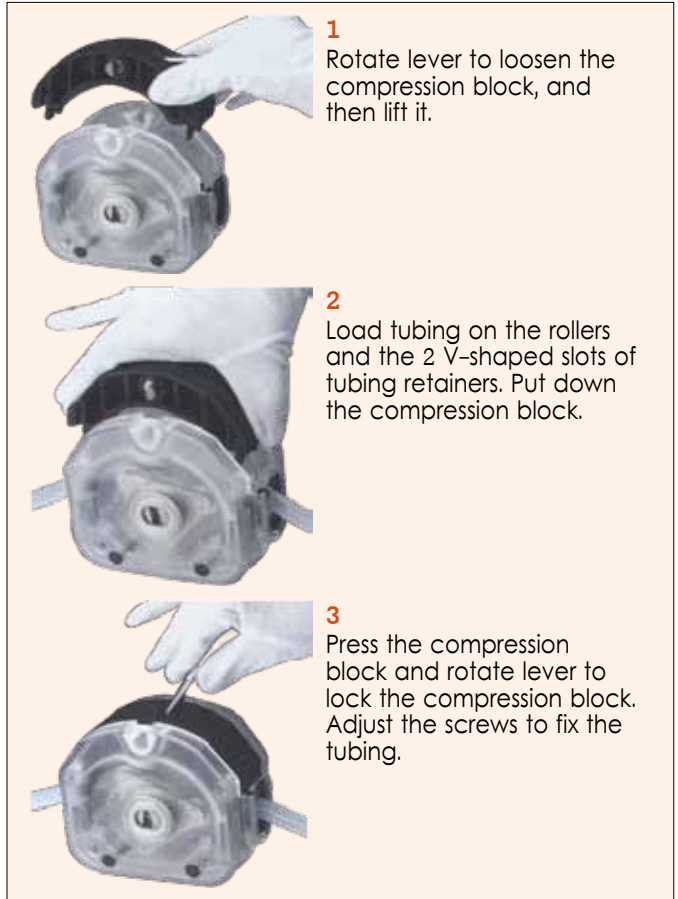
**Upgraded  
Tubing fitting  
Structure**



**KZ25, Quick-load Pump Head**

Stainless steel rollers available PPS compression block. Self-lubrication to reduce tubing wear. Good rigidity for stable size. Good chemical compatibility and high temperature resistance High quality materials form a perfect combination. That offers excellent technical and service performance.

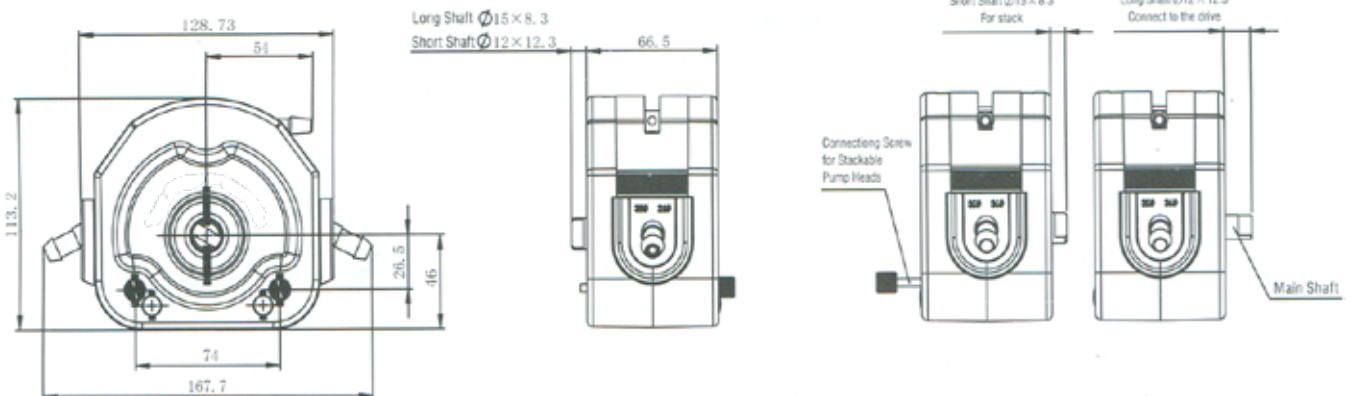
**Tubing Loading Procedure:**



**1**  
Rotate lever to loosen the compression block, and then lift it.

**2**  
Load tubing on the rollers and the 2 V-shaped slots of tubing retainers. Put down the compression block.

**3**  
Press the compression block and rotate lever to lock the compression block. Adjust the screws to fix the tubing.



Model	Max. Flow Rates (mL/min)	Speed (rpm)	Rollers Material	Housing Material	Compression Block Material	Rollers Quantity	Tubing	Weight (Kg)
<b>KZ25</b>	1800	≤600	SS	PC	PPS	3	15"	0.79
	3500						24"	
	5000						35"	
	6000						36"	

# P PERISTALTIC PUMPS Industrial Easy-load Pump Head

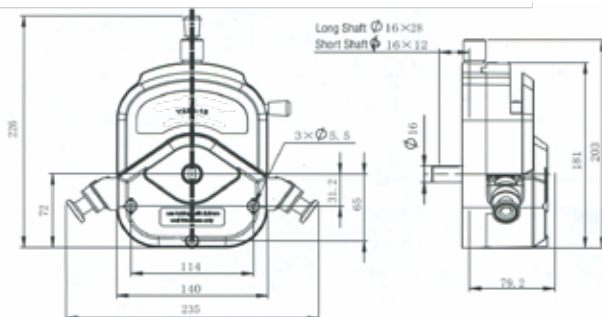
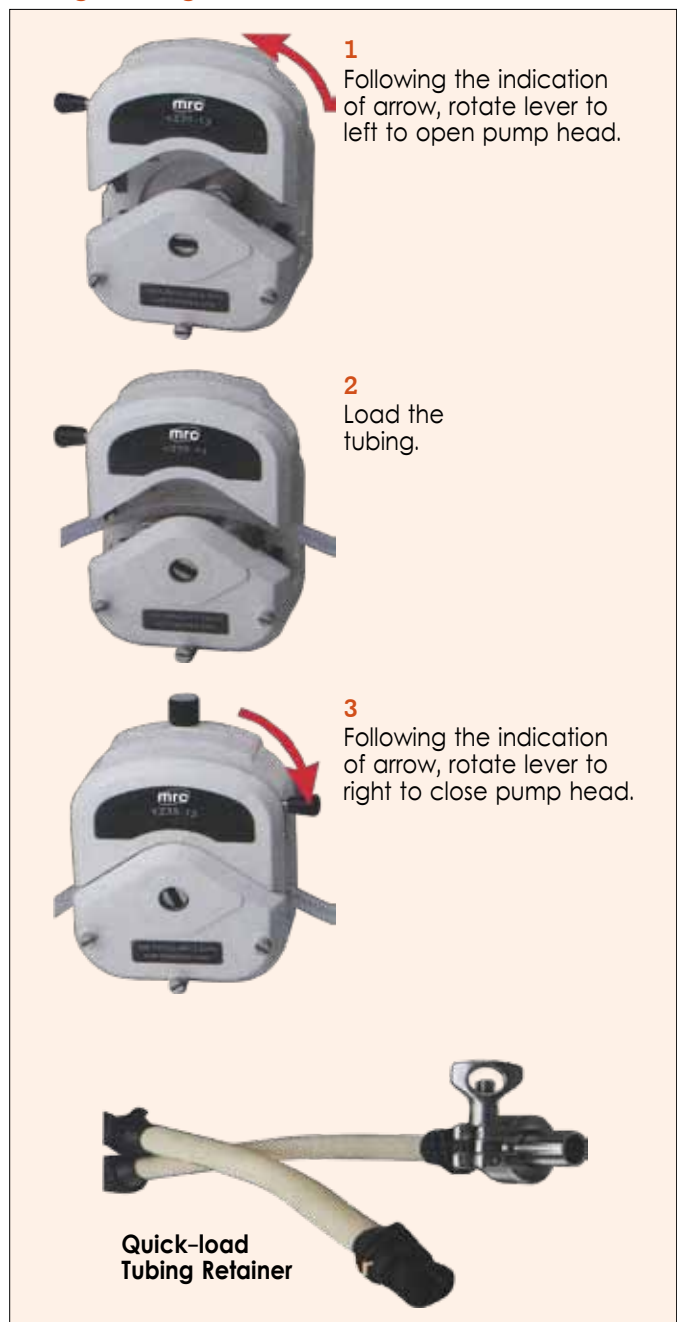


## YZ35-13, Industrial Easy-load Pump Head

### Features:

- Pump heads can be stackable
- Change tubing easily and rapidly
- Automatic tubing retention
- Suitable for several tubing sizes
- The rollers adopt high quality materials and has good wearing property
- The housing of the pump head has perfect rigidity and structure property
- Its material is PSU which has stable performance and high temperature resistance (150°C).

### Tubing Loading Procedure:



Tubing Clamp Mode



Tubing Fitting Mode

Model	Max. Flow Rates (mL/min)	Speed (rpm)	Rollers Quantity	Rollers Material	Housing Material	Tubing	Weight (Kg)
YZ35-13	11000	≤600	3	SS	PSU	73# 82#	1.65

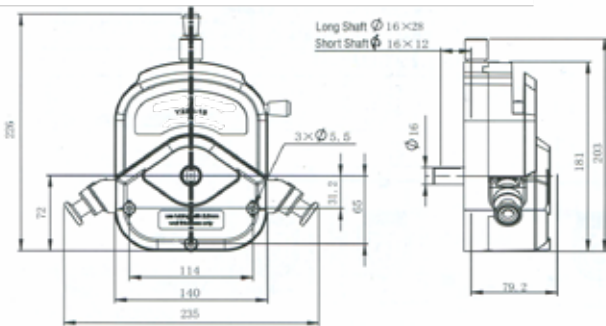


KZ35

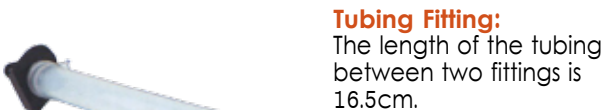
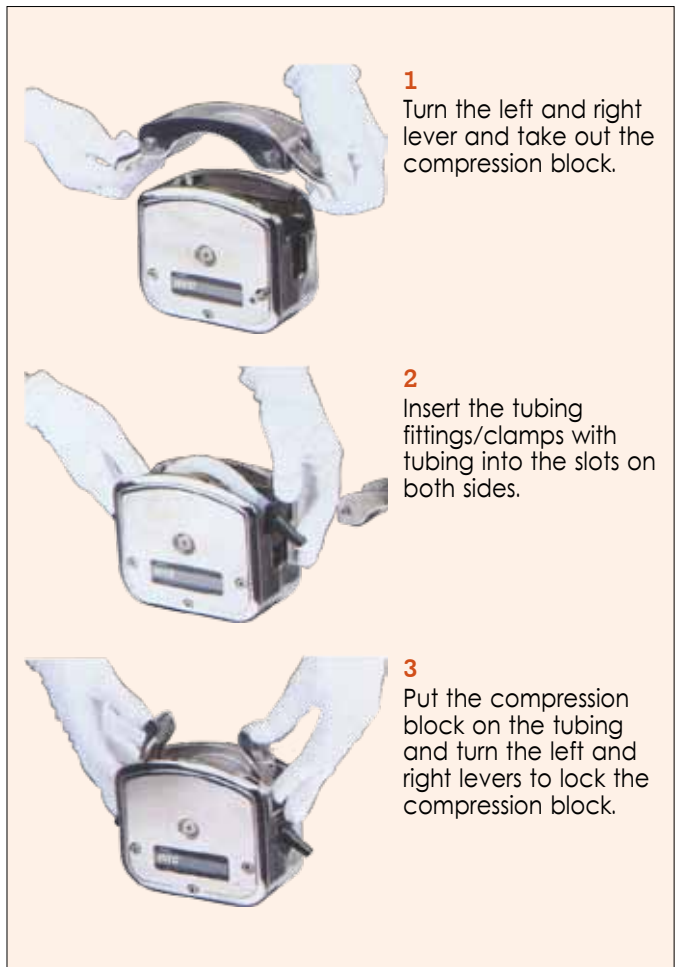
**KZ35, Industrial Quick-load Pump Head**

**Features:**

- Key parts adopt 304 stainless steel. Suitable for pharmaceutical and food industry
- Compression block and base are separate. Easy to load the tubing
- Accept 73# and 82# tubing. The flow rate range is wide
- Two pump heads can be stacked
- The advantage of selecting tubing clamps: No residue fluids in the tubing
- The advantage of selecting tubing fitting: Save tubing cost. The low cost tubing can be connected outside of the pump head.



**Tubing Fittings/Clamps Installation Procedure:**



Model	Max. Flow Rates (mL/min)	Speed (rpm)	Rollers Quantity	Tubing Clamp/Fitting Material	Pump Head Material	Tubing	Weight (Kg)
YZ35	11000	<600	3	PVDF	304 Stainless steel	73# 82#	3.7

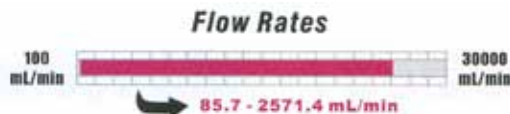
# P PERISTALTIC PUMPS Micro Gear Pumps



## MGP30001JA/MGP30001FA, Micro Gear Pumps for High Temperature/High Pressure Fluid

FLOW-RATE

DISPENSING



MGP30001FA micro gear pump has two work modes of flow mode and dispensing mode.

It delivers flow rates from 85.7 to 2571.4 ml/min and dispensing volume is from 0.1 mL to 999L.

128 X 32 LCD displays the parameters and information. The compact and precise gear pump heads are noiseless, pulsation-free and suitable to transfer high temperature and high pressure fluids.

MGP30001JA can install variable pump head to provide flow rates from 85.7 to 2571.4 ml/min, it adopts brushless DC motor and has features of high efficiency and free maintenance.

Model	MGP30001FA	MGP30001JA
Flow rates	85.7 -2571.4 (mL/min)	
Speed	300-3000rpm,	
Speed accuracy	±1.0%	
Speed resolution	1.0rpm	
Dispensing volume	0.1 mL to 999L	No dispensing function
Copy number	0-9999, 0 means unlimited cycle	
Pause time	1 second to 999 hours, resolution is 0.1 s	
Calibration time	30 to 1800 second, resolution is 1 s	
Communication interface	RS485	
Diameter of particle in liquid	≤ 10μm	
Max. Outlet pressure (Testing medium is water)	MG204: 0.8MPa MG209: 0.8MPa MG213: 0.3MPa	
Liquid temperature	-45 to 50°C with PTFE gear, -45 to 120°C with PEEK gear	
Viscosity of liquid	≤ 200cSt	
Power supply	AC 176-264V/90-130V, 50/60Hz	
Power consumption	≤50W	
Operating condition	Temperature 0 to 40°C Relative humidity <90% (non-condensing)	
Drive dimensions	232x142x149(mm) (LxWxH)	
Weight	2.83 kg	
IP rating	IP31	

### Functions and Features:

- Acceptable pump head: MG204, MG209, MG213
- Suitable to transfer high temperature fluids or high pressured fluids
- Prime function for fast filling and emptying
- Flow rates and dispensing volume can be calibrated (MGP30001FA)
- Display: 128 x 32 LCD display all the running parameters (MGP30001FA)
- External control input functions: Control the flow rates and start/stop of the pump
- External control output functions: Output start/stop and speed signal (MGP30001FA)
- Dispensing function: Dispensing volume, copy number and pause time can be set (MGP30001FA)
- Footswitch: Control the start/stop of the pump
- Communication function: Realize computer control through RS485 interface
- Memory function: Store the running parameters automatically
- Cooling code: Heat-emitting fan
- Decoupling will occur when the pump load exceeds the maximum coupling torque provided by the alignment of the two magnets.

Applicable Pump Heads: MG204  
MG209  
MG213



Model	Pump Head	Speed (rpm)	Flow Rates (mm)	Weight (Kg)
MGP30001JA MGP30001FA	MG204	300-3000	85.7-857.1	3.25
	MG209		171.4-1714.3	3.26
	MG213		257.1-2571.4	3.28

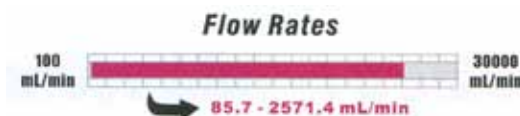


Model	MGP30001FB	MGP30001JB
<b>Flow rates</b>	85.7 -2571.4 (mL/min)	
<b>Speed</b>	300-3000rpm,	
<b>Speed accuracy</b>	±1.0%	
<b>Speed resolution</b>	1.0rpm	
<b>Dispensing volume</b>	0.1 mL to 999L	No dispensing function
<b>Copy number</b>	0-9999, 0 means unlimited cycle	
<b>Pause time</b>	1 second to 999 hours, resolution is 0.1 s	
<b>Calibration time</b>	30 to 1800 second, resolution is 1 s	
<b>Communication interface</b>	RS485	
<b>Diameter of particle in liquid</b>	≤ 10µm	
<b>Max. Outlet pressure (Testing medium is water)</b>	MG204: 1.4MPa MG209: 0.9MPa MG213: 0.8MPa	
<b>Liquid temperature</b>	-45 to 50°C with PTFE gear, -45 to 120°C with PEEK gear	
<b>Viscosity of liquid</b>	≤ 200cSt	
<b>Power supply</b>	AC 220V/110V + 20%, 50Hz/60Hz	
<b>Power consumption</b>	≤150W	
<b>Operating condition</b>	Temperature 0 to 40°C Relative humidity <90% (non-condensing)	
<b>Drive dimensions</b>	290x207x180(mm) (LxWxH)	
<b>Weight</b>	5.1 kg	
<b>IP rating</b>	IP31	

## MGP30001JB/MGP30001FB, Micro Gear Pumps for High Temperature/High Pressure Fluid

FLOW-RATE

DISPENSING



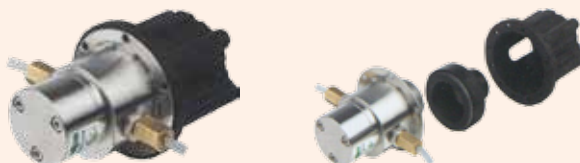
MGP30001FB gear pump has two work modes of flow mode and dispensing mode. It delivers flow rates from 85.7 to 2571.4ml/min and dispensing volume is from 0.1 mL to 999L. 128 X 32 LCD displays the parameters and information. The compact and precise gear pump heads are noiseless, pulsation-free and suitable to transfer high temperature and high pressure fluids.

MGP30001JB can install variable pump head to provide flow rates from 85.7 to 2571.4 ml/min, it adopts brushless DC motor and has features of high efficiency and free maintenance.

### Features:

- Acceptable pump head: MS204, MS209, MS213
- Suitable to transfer high temperature fluids or high pressured fluids
- Prime function for fast filling and emptying
- Flow rates and dispensing volume can be calibrated (MGP30001FB)
- Display: 128 x 32 LCD display all the running parameters (MGP30001FB)
- External control input functions: Control the flow rates and start/stop of the pump
- External control output functions: Output start/stop and speed signal (MGP30001FB)
- Dispensing function: Dispensing volume, copy number and pause time can be set (MGP30001FB)
- Footswitch: Control the start/stop of the pump
- Communication function: Realize computer control through RS485 interface
- Memory function: Store the running parameters automatically
- Cooling code: Heat-emitting fan
- Decoupling will occur when the pump load exceeds the maximum coupling torque provided by the alignment of the two magnets.

**Applicable Pump Heads:** MG204  
MG209  
MG213



Model	Pump Head	Speed (rpm)	Flow Rates (mm)	Weight (Kg)
MGP30001JB MGP30001FB	MG204	300-3000	85.7-857.1	5.39
	MG209		171.4-1714.3	5.40
	MG213		257.1-2571.4	5.42

# P SYRINGE PUMPS



**TJ1A** This pump is a single-channel micro syringe pump which only has infusion mode. It combines precision, compact size with ease of installation and operation. It can hold microLiter unit standard glass syringe. The features of accurate distance control and broad linear speed range (7.9 m/min - 79.4 mm/min) can meet versatile requirements. Its vertical (horizontal) installation structure makes this pump easily used in micro manipulator, stereotaxic instrument for various biologic research applications.

#### Functions and Features:

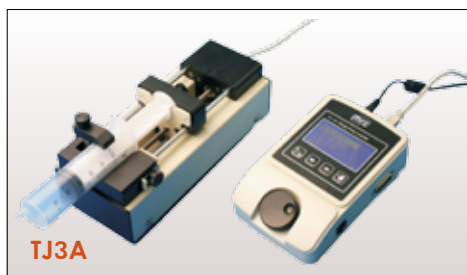
Working mode: Infusion • User-defined glass syringe: Save 4 inner diameters of user-defined glass syringe barrel • Linear force output: Full stroke > 20 N • Memory function: Select resume operation or remain stopped when power returns after an interruption • Signal output: Start/Stop output, cw/ccw output (open collector) • Calibration: Acquire accurate volume through calibration • Fast forward & fast reverse: Infusion or filling at the max. speed.



**TJ2A** This pump is a single-channel micro syringe pump which has infusion/withdrawal mode. It combines precision, compact size with ease of installation and operation. It can hold unit standard glass syringe. The features of accurate distance control and broad linear speed range (7.9 m/min - 79.4 mm/min) can meet versatile requirements. Its vertical (horizontal) installation structure makes this pump easily used in micro manipulator, instrument for various biologic research applications.

#### Functions and Features:

• Working mode: Infusion, withdrawal, infusion/withdrawal, withdrawal/infusion, continuous • User-defined glass syringe: Save 4 inner diameters of user-defined glass syringe barrel • Linear force output: Full stroke > 20 N • Memory function: Select resume operation or remain stopped when power returns after an interruption • Signal output: Start/Stop output, cw/ccw output (open collector) • Calibration: Acquire accurate volume through calibration • Fast forward & fast reverse: Infusion or filling at the max. speed.



**TJ3A** This pump is a single channel micro syringe pump which has infusion/withdrawal mode. It combines precision, compact size, multiple functions with ease of operation. It can hold milliLiter unit standard syringe. The features of accurate distance control and broad linear speed range (7.9 m/min - 79.4 mm/min) can meet versatile requirements. The drive unit is independent. It is easy to combination and installation. It can meet different operation requirements and is suitable for various research fields.

#### Functions and Features:

Working mode: Infusion, withdrawal, infusion/withdrawal, withdrawal/infusion, continuous • User-defined syringe: Save 4 inner diameters of user-defined syringe barrel • Linear force output: Whole course > 90 N • Memory function: Select resume operation or remain stopped when power returns after an interruption • Signal output: Start/Stop output, cw/ccw output (open collector) • Calibration: Acquire accurate volume through calibration • Fast forward & fast reverse: Infusion or withdrawal at the max. speed.



**LSP-01** This pump is a single channel syringe pump which only has infusion mode. The acceptable syringe specification is from 10  $\mu$ L to 60 mL. Suitable for high accuracy and small flow rate liquid transferring.

#### Features:

Syringe Selection: A suitable syringe can be selected via the manufacturer table. This includes manufacturer, material and size or input the inner diameter of the syringe barrel • Easy to operate: Combining big screen LCD display with rotary coded switch & membrane keypad makes the operation simple & prompt.

#### Memory Function:

The parameters are saved in EEPROM. The parameters don't need to be reset when power returns after an interruption • In flow rate mode, the pump remains running or stop according to the setting parameters when power returns after an interruption.

#### Protection Function:

The pump will stall and give an alarm when the drive structure of the pump is blocked. External Control Function: Input/output control. Calibration Function: Acquire accurate volume through calibration. Syringe Protection: Adjust syringe rest to prevent syringe from damaging.



**MPC Series, Research MicroPipettes**

**Pipettes are having smart soft hand-grip of Thermoplastic Elastomer (TPE) ensuring.**

- Minimum transfer of body heat to the Pipets resulting in high accuracy even on continuous use
- Minimum fatigue of hands & necks
- Reduced thumb stress
- Easy identification through color coding
- Very attractive look.



1. Soft Comfort - The smooth plunger mechanism offers least resistance for ease of effortless accuracy.
2. Comfortable Finger Rest - for resting of the Pipette on either hand.
3. Tip ejector - for smooth ejection of the tip preventing any contamination.
4. Ergonomic - Best in-hand grip for comfort.
5. Precise setting - of the selected volume ensures accurate dispensing of the liquid.
6. Light weight - of the Pipette makes your job less tiresome & improves efficiency.
7. Ideal Shaft Shape - Helps reach contents in narrow or deep tubes.
8. Durable Tip Cone - offers highest resistance to shocks and chemical corrosion.
9. Fully autoclavable option.

**Variable Volume MicroPipettes**

Model	Volume Range	Increment	Inaccuracy (±)%	Imprecision (±)%
MPC-2.5	0.1 - 2.5µl	0.01µl	12	6
			2.5	1.6
MPC-10	0.5 - 10µl	0.1µl	2.5	1.5
			1	0.8
MPC-50	5 - 50µl	0.5µl	2	2
			0.6	0.3
MPC-100	10 - 100µl	0.5µl	3	1.5
			0.8	0.15
MPC-1000	100 - 1000µl	5.0µl	2	0.7
			0.6	0.2
MPC-20	2 - 20µl	0.1µl	3	2
			0.9	0.4
MPC-200	20 - 200µl	0.1µl	2	0.8
			0.6	0.15
MPC-5000	500 - 5000µl	50.0µl	2	0.6
			0.5	0.2

\* Add A for fully autoclavable.

**MicroPipette Stands**

Model	Capacity
151-1-000013	4 MicroPipettes
151-1-000014	6 MicroPipettes



- Soft smart finger-grip of TPE.
- Manifold can rotate 360° for easy right or left hand operation.
- Easily removable & fully autoclavable manifold.
- One hand tip ejection.
- Soft force tip loading and ejection.
- Consistent sample loading.
- Leak free sealing of tip.
- Attractive color coding.
- Compatible with most types of tips.
- Calibration report enclosed with every Pipette.
- Fully autoclavable option.

**Multichannel MicroPipettes**

Model	Vol. Range	Channel	Increment	Inaccuracy(±)%	Imprecision(±)%
MPC8-10	0.5 - 10µl	8	0.1	4	4
				1.5	1.5
MPC8-50	5 - 50µl	8	0.5	3	2
				1	0.7
MPC8-100	10 - 100µl	8	1	1.5	1.5
				1	0.5
MPC8-300	30 - 300µl	8	1	1.5	0.75
				0.8	0.25
MPC12-10	0.5 - 10µl	12	0.1	4	4
				1.5	1.5
MPC12-50	5 - 50µl	12	0.5	3	2
				1	0.7
MPC12-100	10 - 100µl	12	1	1.5	1.5
				1	0.5
MPC12-300	30 - 300µl	12	1	1.5	0.75
				0.8	0.25

\* Add A for fully autoclavable.





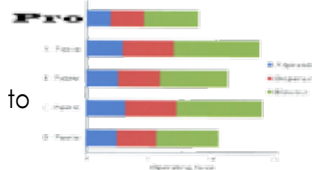
MPP

**MPP Series, Gen-Next MicroPipettes**

- Surprisingly light weight yet robust
- Color coding for easy identification
- Special engineering plastics resulting in better protection against chemical and physical corrosion
- Fully autoclavable
- Enhanced UV resistance for higher durability
- Calibrated in ISO 17025 accredited laboratory. Supplied with individual QC and calibration report according to ISO 8655.
- Ergonomic design
- Light & smooth plunger action
- Soft feel handle grip
- Suitable for both – left and right hand users.



- One of the lowest operating force requirement compare to most of the Pipettes.



- Large and clear 4 digit display giving smaller increments for wider volume selection options
- Resistance free click stop counter
- Volume display is always visible while Pipetting.



- Soft touch tip ejection
- Locking mechanism for preventing accidental volume changes.



- Special Teflon™ sealing mechanism in lieu of conventional O-ring resulting in long lasting precise and smooth operation.



- In house cleaning, repair and calibration possible without any special tools
- Easily accessible recalibration mechanism.

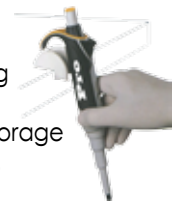


MPP8

- Pipette handle has coating of Thermoplastic Elastomer which prevents transfer of body heat to the Pipette ensuring high accuracy even during continuous use.



- Shelf mounting stand for convenient storage and handling.



- Manifold can rotate 360° to allow any convenient Pipetting angle
- Specially designed tip cone with O-ring resulting in:
  - Leak free operation
  - Smooth and light loading and ejection
  - Choice of variety of tips
- Each channel is calibrated individually
- Includes all innovative features of Pro single channel Pipette.



**Fix Volume MicroPipette:**

Model	Volume ( $\mu\text{l}$ )	Inaccuracy ( $\pm$ ) %
MPPF-2.5	2.5	2
MPPF-5	5	1.3
MPPF-10	10	1.2
MPPF-20	20	1
MPPF-25	25	1
MPPF-50	50	0.7
MPPF-100	100	0.6
MPPF-200	200	0.6
MPPF-250	250	0.6
MPPF-500	500	0.6
MPPF-1000	1000	0.6
MPPF-2000	2000	0.3
MPPF-5000	5000	0.3
MPPF-10000	10000	0.6

**Pipette Stands:**

Model	Description
151-1-000040	Carousel stand for 6 Pipettes
151-1-000041	Shelf mount Pipette holder

**Variable Volume MicroPipette:**

Model	Test Volume ( $\mu\text{l}$ )	Increments ( $\mu\text{l}$ )	Inaccuracy ( $\pm$ ) %
MPP-2.5	0.25	0.002	12
	1.25		3
	2.5		2.5
MPP-10	1	0.02	2.5
	5		2
	10		1
MPP-20	2	0.02	3
	10		1.5
	20		0.9
MPP-50	5	0.1	2
	25		0.8
	50		0.6
MPP-100	10	0.1	3
	50		1
	100		0.8
MPP-200	20	0.2	2.5
	100		0.7
	200		0.6
MPP-1000	100	1	3
	500		1
	1000		0.6
MPP-5000	500	10	2.4
	2500		1.2
	5000		0.6
MPP-10000	1000	20	3
	5000		1.8
	10000		0.6

**8/12 Channel MicroPipette:**

Model	Test Volume ( $\mu\text{l}$ )	Increments ( $\mu\text{l}$ )	Inaccuracy ( $\pm$ ) %
MPP8-10 MPP12-10	1	0.002	8
	5		4
	10		2
MPP8-20 MPP12-20	2	0.02	7
	10		3
	20		2
MPP8-50 MPP12-50	5	0.1	3
	25		1.5
	50		1
MPP8-100 MPP12-100	10	0.1	3
	50		1
	100		0.8
MPP8-200 MPP12-200	20	1	5
	100		1
	200		0.7
MPP8-300 MPP12-300	30	0.02	3
	150		1
	300		0.6

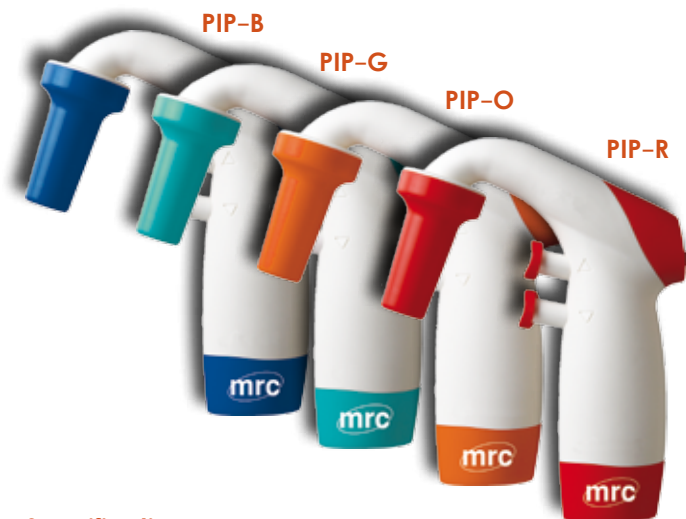


PIP-Series

**PIP Series, Smart Pipette Controllers**

**Powerful yet quiet pump • Soft grip push buttons**  
**• Double safety valve • Autoclavable Pipette cone.**

- Can fill 25ml Pipette under 4 seconds.
- Safety valve and hydrophobic filters provide double protection against fluid penetration.
- 2 different speed modes – High & Low along with Gravity drain.
- The pump speed can also be fine-tuned by varying finger pressure on operating knobs for better control of speed.
- Cadmium free environment friendly NiMH batteries.
- Batteries can be changed very easily by the user.
- The intelligent charger prevents over charging I heating of batteries.
- Low battery indicator.
- The specially designed Desktop Stand enables the PipetteHelp to be charged while resting on it.
- The PipetteHelp can hold the serological Pipette while resting on Desktop Stand.



**Ordering Information:**

Model	Description
PIP-R	Red
PIP-B	Blue
PIP-O	Orange
PIP-G	Green

**Accessories:**

Model	Description
151-1-000001	Silicone Pipette adaptor with safety valve
151-1-000002	Pipette cone- autoclavable - Red
151-1-000003	Pipette cone- autoclavable - Blue
151-1-000004	Pipette cone- autoclavable - Orange
151-1-000005	Pipette cone- autoclavable - Green
151-1-000006	PTFE membrane Filter Set, 0.20 11m (5pes)
151-1-000007	PTFE membrane Filter Set, 0.45 11m (5pes)
151-1-000008	Battery charger
151-1-000009	Adaptor for charger plug
151-1-000010	NiMH battery (set of two batteries)
151-1-000011	Wall mounting stand
151-1-000012	Desktop stand

**Specifications:**

<b>Power</b>	2 x 1.2 V 11000 mAh NiMH batteries
<b>Battery Service Life</b>	Eight hours continuous use
<b>Battery Charging time</b>	2 - 3 hours to charge fully
<b>Volumetric Range</b>	Plastic or Glass Pipette from 0.1ml up to 200ml
<b>Safety System</b>	Replaceable hydrophobic 0.45 11m PTFE filter Safety check valve
<b>Standard Accessory</b>	Battery charger (UK plug) Desktop Stand Hydrophobic PTFE membrane filter 0.45 11m 1 Pc Hydrophobic PTFE membrane filter 0.20 11m 1 Pc Wall mounting stand with screw



Comfortable stress-free operating knob  
**564**



Wall mounting stand with fixing screw



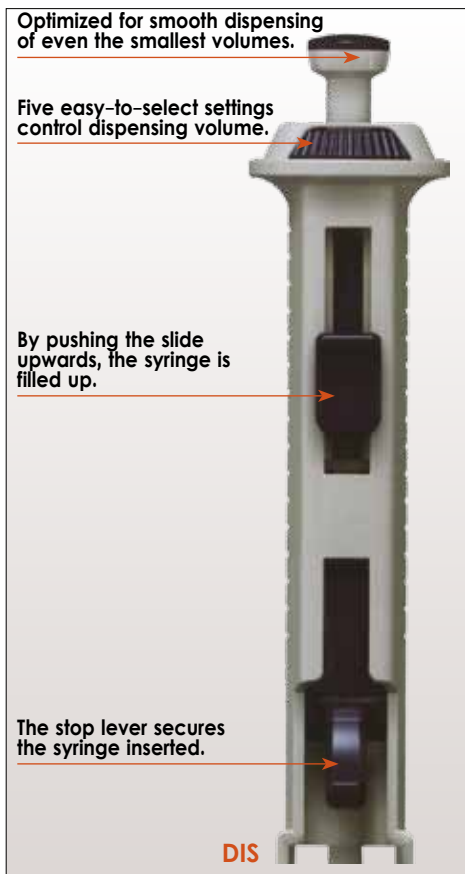
One hand operations



Desktop stand



Attractively color coded



**DIS, StepMate Stepper**

**Features:**

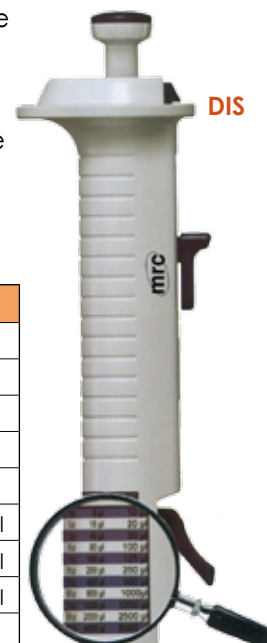
- Lightweight and ergonomic
- One-hand operation
- Factory calibrated
- Volume range of 1µl to 5ml can be dispensed
- Maintenance free
- Equipped with durable tip insertion lever
- Works with seven sizes of disposable, polypropylene syringes from 0.5ml to 50ml.

**Select the Dispensing Volume:**

- Find the required dispensing volume
- Use the adjusting wheel to set the required volume
- Select and inserting suitable tips
- Confirm the maximum dispensing steps.

Select suitable tips      Select Dispensing Volume

Tips	Sel.	1	2	3	4	5
0.05ml		1µl	2µl	3µl	4µl	5µl
0.50ml		10µl	20µl	30µl	40µl	50µl
1.25ml		25µl	50µl	75µl	100µl	125µl
2.50ml		50µl	100µl	150µl	200µl	250µl
5.00ml		100µl	200µl	300µl	400µl	500µl
12.50ml		250µl	500µl	750µl	1000µl	1250µl
25.00ml		500µl	1000µl	1500µl	2000µl	2500µl
50.00ml		1000µl	2000µl	3000µl	4000µl	5000µl
<b>Steps</b>		<b>48</b>	<b>23</b>	<b>15</b>	<b>11</b>	<b>8</b>



**Specifications:**

Dial setting	1	2	3	4	5		
<b>Number of steps</b>	<b>48</b>	<b>23</b>	<b>15</b>	<b>11</b>	<b>8</b>		
Syringe volume (ml)	Sample volume (µl)					A%	P%
0.50	10	20	30	40	50	±0.8	<0.7
1.25	25	50	75	100	125	±0.8	<0.5
2.50	50	100	150	200	250	±0.8	<0.4
5.00	100	200	300	400	500	±0.4	<0.3
12.50	250	500	750	1000	1250	±0.3	<0.3
25.00	500	1000	1500	2000	2500	±0.2	<0.3
50.00	1000	2000	3000	4000	5000	±0.2	<0.2

Note: The first & last dispensing liquid should be discarded or back into container vessel.

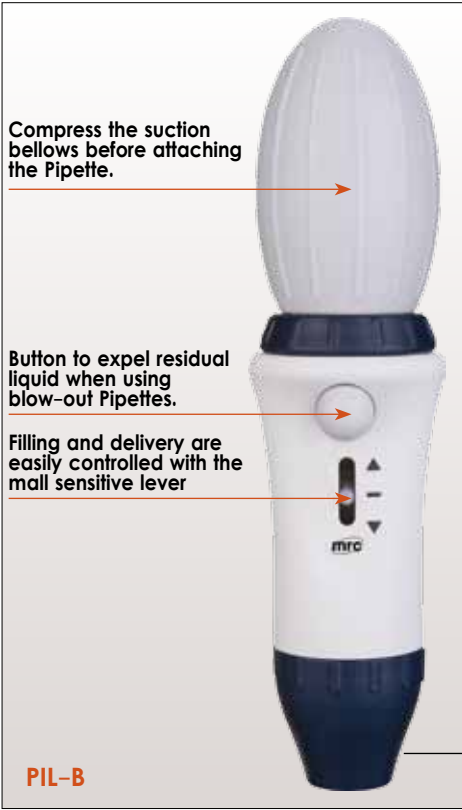
Optional BRAND PD tips are particularly suitable for dispensing of fluids with high viscosity, high vapor pressure etc.

PD tips are made from high-quality materials (Cylinder: PP. Piston: PE-HD) without soft lubricants or other additives.

It can be used with compatible, third-party dispensing systems of BRAND, Rainin and Eppendorf.

**Ordering Information:**

Model	Description
<b>DIS</b>	StepMate
<b>17900024</b>	0.5ml, piston PE-HD, cylinderPP,non-sterile. 1 pc, 100pcs/packing
<b>17900025</b>	1.25ml, piston PE-HD. cylinderPP.non-sterile, 1 pc, 100pcs/packing
<b>17900026</b>	2.5ml, piston PE-HO, cylinderPP,non-sterile. 1 pc, 100pcs/packing
<b>17900027</b>	5.0ml, piston PE-HO, cylinderPP,non-sterile. 1 pc, 100pcs/packing
<b>17900028</b>	12.5ml, piston PE-HD, cylinderPP,non-sterile, 1 pc. 100pcs/packing
<b>17900029</b>	25ml, piston PE-HD, cylinder PP, non-sterile, 1 pc, 50pcs/packing with adaptor
<b>17900030</b>	50ml, piston PE-HD, cylinder PP, non-sterile, 1 pc, 25pcs/packing with adaptor



**PIL Series, Pipette Controller**

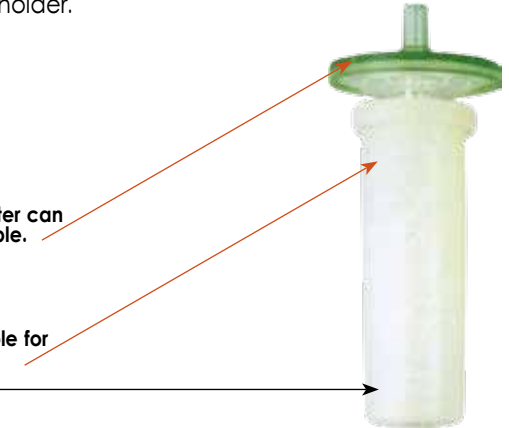
**Features:**

- Five colors optional
- Comfortable and simple to use
- Precise Pipetting control
- Robust and lightweight
- 0.1–100ml volumetric or serological Pipettes can be used
- Filling and delivery are easily controlled with a small sensitive lever
- Uses integral and replaceable 3µm filter
- Easy to maintain and clean
- Autoclavable silicone Pipette holder.

**17000110**

The 3.0µm filter and adapter can be integral and replaceable.

Silicone adapter suitable for 0.1–100ml Pipette.



**Ordering Information:**

Model	Description
PIL-B	Blue
PIL-R	Red
PIL-G	Green
PIL-Y	Yellow
PIL-P	Pink
Accessories	
17000110	Filter 3.0µm, 1 pc/pk



## PLRM-4, Full-Circle Manual Polarimeters

**PLRM-4** manual polarimeters is ideal for determining concentration levels of samples for applications in the medical, educational, pharmaceutical, and cosmetic industries etc.



### Specifications:

Measurement Range:  $-180^{\circ}$  to  $+180^{\circ}$   
 Scale Value:  $1^{\circ}$   
 Vernier:  $\pm 0.05^{\circ}$   
 Magnifier: 3X  
 Light Source: Sodium Lamp  
 Wavelength: 589.44nm  
 Tube Length: up to 200mm  
 Stable Time: 10 minutes  
 Power Requirements: 220V/50Hz  
 Dimensions: L500x W135x H330mm  
 Weight: 5kg.

Rotate the vernier knob till the visual field to equal brightness. (Zero point).

**Easy Measurement:** The polarimeters with 589.44nm monochromatic sodium lamp. After powered on, the polarized light beam is immediately project on filter, polarizer etc. You can view the visual fields of brightness or shade through eyepiece. Put the sample tube in measuring field chamber. Rotate the vernier knob again, you can view equal brightness. Read the scale from magnifier that is measured value.

### Specific Optical Rotation Measurement:

Specific optical rotation is constant of substance, you can measure it by 100mm glass tube when temperature of solution at  $20^{\circ}\text{C}$ .

**Purity Measurement:** The polarimeters is ideal for determining purity of sample. If you want to know its purity, you need only measure its the angle of rotation and calculate it.

**Concentration Measurement:** For some substance of known specific optical rotation, you can measure its the angle of rotation and calculate concentration according to formula.

**International Sugar Scale:** According to international sugar scale, put the 26 grams pure sugar in solution, The angle of rotation of solution is  $34.626^{\circ}$ . By the rules, you can calculate the purity of sugar.



## PLRS-5, Semiautomatic Polarimeters

**Introduction:** **PLRS-5** semiautomatic polarimeters used to measure angle of rotation, specific optical rotation of optically active substance. You can calculate its purity, concentration and percentage by measured value.



**Features:** Microprocessor-Based • The angle of rotation is digitally displayed • Simple push-button adjustment of visual fields • Zero indicator light confirms accurate calibration.

**Specification:** Measuring Range:  $-180^{\circ}$  to  $+180^{\circ}$  • Accuracy:  $\pm 0.02^{\circ}$  • Light Source: Sodium lamp • Optical Wavelengths: 589.44nm • Stable Time: 5 minutes • Tube Length: up to 200mm • Power Requirements: 220VAC/50Hz • Dimensions: 590(L)x255(W)x400(H)mm • Weight: 7kg.



## PLRA-2B, Automatic Polarimeter



Measuring range:  $\pm 45^\circ$   
 Accuracy:  $\pm(0.01^\circ + \text{measuring value} \times 0.05\%)$   
 Repeatability:  $\leq 0.01^\circ$   
 Display: 5 LCD  
 Minimum indicating value: 0.002°  
 Monochromatic light source: sodium lamp (589.44nm)  
 Sample tube: 200mm, 100mm  
 Power supply: 220V $\pm$ 22V, 50Hz $\pm$ 1Hz  
 Outer size: 600mm  $\times$  320mm  $\times$  220mm  
 Weight (net): 28kg  
 RS232 interface: band rate 9600, 1 bit stop, 8 bits data

**Introduction:** The polarimeters is a kind of instrument for measuring the optical rotation of a substance. Through measuring the optical rotation, the polarimeters can be used to analyze the concentration, content, and purity of a substance. The PLRA-2B automatic polarimeters utilizes the photoelectric detection automatic balance principle and the results are displayed by LCD. PLRA-2B automatic polarimeters is characterized by its small size, high sensitivity, human error-free, easy reading, and so on. Furthermore, this instrument is also suitable to the sample of low optical rotation which is difficult to be analyzed by visual polarimeters. Therefore, it can widely be used in various fields of the organic chemical industry.

**Agriculture:** use in contents analyses of agricultural antibiotic, hormone, microbial agro-pharmaceuticals and agricultural products.

**Medication:** use in analyses of antibiotic, vitamin and glucose and in pharmacological research.

**Food:** use in analyses of sugar, monosodium glutamate and soy sauce, in inspection of their final products and determination of sugar content in food.

**Petroleum:** use in analyses of mineral oil and in control of oil ferment process.

**Essence:** use in analyses of essential oil.

**Health:** use in analyses of diabetics' urine.

## AP-81/85, Automatic Polarimeters

AP-81/85 Automatic Polarimeters includes built-in Peltier precise temperature control system, automatic photoelectric inspection technology and WINDOWS HMI system, boasts accurate and reliable measurement, convenient operation and so on. By detecting the specific rotation, the density, content and purity, etc. of substances can be analyzed and determined. It's widely used in medicine, petroleum, food, chemicals, flavors, spices, sugar making, other industries and universities & research institute.



### Characteristics:

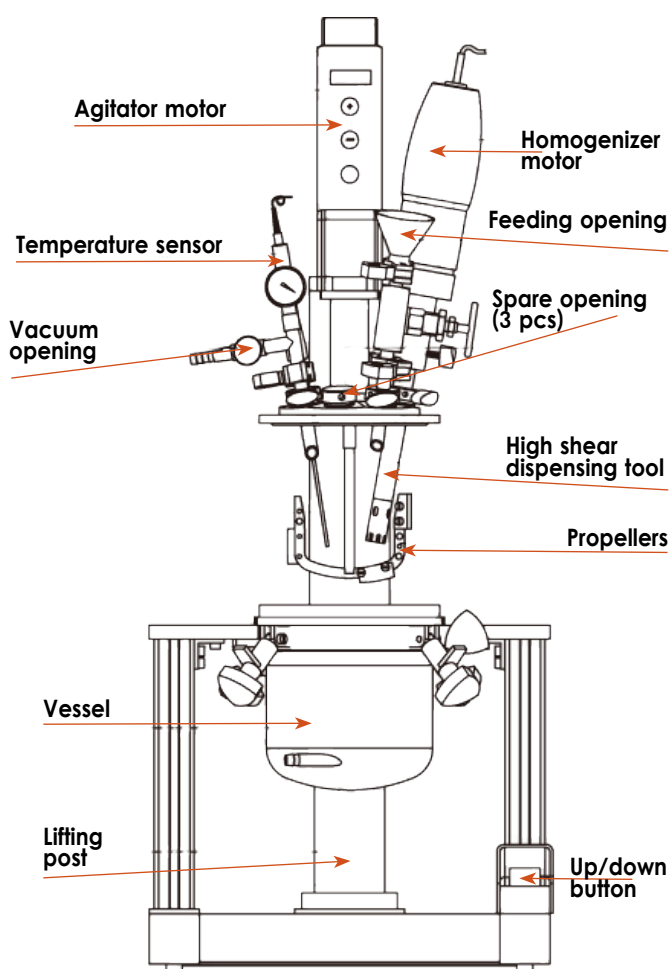
- Automatic photoelectric inspection technique & built-in Peltier precise temp. Control system ensure measurement accuracy and stability.
- Large color touch screen display and innovative WINDOWS software interface give extremely convenient device operation & data acquisition.
- High brightness LED lights with service life exceeding 5000 hours.
- A variety of measurement modes are optional, without using complicated manual calculation.
- Extremely large storage capacity can store up to 1000 groups of data information automatically.

Model	AP-81/AP-81A	AP-85/AP-85A
Measuring range	$\pm 89.99^\circ$ (specific rotation)	
Accuracy	0.01° (full scale)	
Min. reading	0.001° (specific rotation)	
Repeatability (standard deviations)	0.002° (specific rotation)	
Measurable sample min. transmittance	1%	
Working wavelength	589.3nm (Sodium D spectrum)	
Temperature control mode	-	built-in semiconductor
Temperature control range	-	15°C~30°C
Temperature control accuracy	-	$\pm 0.3^\circ\text{C}$
Resolution	-	0.1°C
Interface	USB and RS232	
Data storage capacity	1,000 pieces	
Display modes	5.6 inches, TFT, touch screen	
Power supply	220VAC $\pm$ 10%, 50Hz	
Power	250W	
Net weight	24Kg	26Kg
Calibration mode	Automatic Calibration for 81A/85A version	
Dimensions	708mm $\times$ 330mm $\times$ 287mm	



**REACT-Series, Reactors**

Reactor system of lab scale includes working capacities of 1L, 2L, and 5L. It can complete material dispersing, emulsifying, homogenizing and mixing processes under vacuum or pressurized conditions. It can intimate industrial production in laboratory by selecting high efficiency macro agitators, high shear homogenizing emulsifiers, vacuum seal system, and different sensor systems.



Model	REACT-1L	REACT-2L	REACT-5L
Power supply	220V, 50/60Hz		
Min. agitating capacity	300ml	500ml	1,000ml
Min. emulsifying capacity	300ml	1,000ml	2,500ml
Max. emulsifying capacity	1,000ml	2,000ml	5,000ml
Max. working temperature	120°C		
Accessible vacuum condition	-0.08Mpa		
Max. handling viscosity	100,000CP		
Agitator motor power	110W		
Agitator rotation speed	10-200rpm		
Agitator type	Anchor agitator with scrapers		
Scraper materials	Silicon rubber		
Homogenizer motor power	500W		
Homogenizer rotation speed	10,000rpm-28,000rpm		
Homogenizer generator type	20DG	25DG	
Openings on vessel cover	Homogenizer opening, hopper opening, temperature gauge opening, vacuum opening, 3 spare openings		
Lifting height	210	270	
Main medium-contact materials	SS316L, borosilicate glass, FKM		
Outer diameter of vacuum opening	10		
Jacket inlet/outlet size	12	16	
Ambient temperature	5-40°C		
Permissible relative humidity	80%		
Overall dimension	400×390×780		480×420×850
Standard gross weight	35kg	37kg	42kg
Package	Wooden case		



REAC

## REAC-Series, Reactors

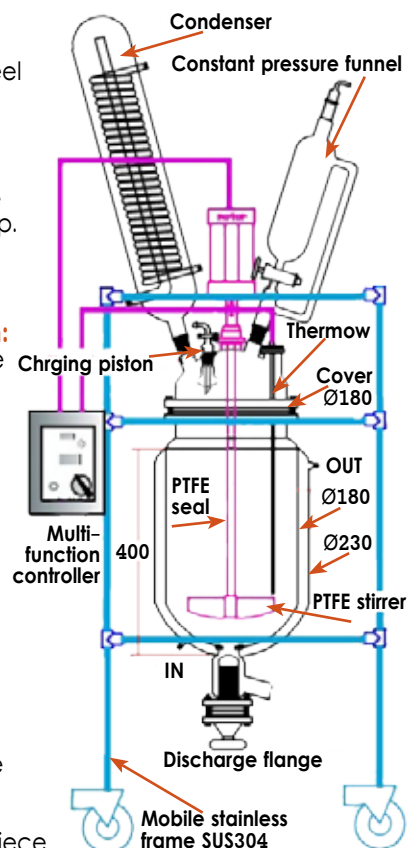
Glass reactors or mixing vessels are frequently used for stirring, dissolving, mixing, extraction and other processes in labs and pilot plants. Jacketed models permit heat exchange for better dissolving and crystallization. Mobile mixing vessels can be transported with their content for further processing. They can also be equipped with condensers for vacuum distillation.

### Features:

- Borosilicate glass 3.3
- Compact stainless steel mobile frame
- PTFE seal, Ø8mm PTFE stirrer (stainless steel core, the outer PTFE)
- PTFE active discharge valve, electronic temp. measurement
- Constant speed stir controller.

### Detailed configuration:

- Glass jacket - 1 piece
- Cover - 1 piece
- PTFE seal - 1 set
- PTFE stirrer - 1 set
- Body tray (aluminium alloy) - 1 piece
- Clamp (aluminium alloy) - 1 piece
- Manipulator (stainless steel) - 2 pieces for 1-10L, 3 pieces for 20-100L
- Gear motor (panasonic) - 1 set
- Multi-function controller - 1 set
- Mobile stainless frame SUS 304 - 1 set
- Condenser - 1 piece
- Dropping bottle - 1 piece
- Thermowell - 1 piece
- Solid feed inlet - 1 piece (for up to 10L)
- Charging piston - 1 piece
- Frequency converter - 1 set
- PTFE discharging valve - 1 piece.



Model	REAC-1L	REAC-2L	REAC-3L	REAC-5L	REAC-10L	REAC-20L	REAC-30L	REAC-50L	REAC-100L
Capacity (L)	1	2	3	5	10	20	30	50	100
ports	4			5	6				
Flange cover diameter	150mm			180mm	265mm				340mm
Cylinder diameter	113/135/150mm			180mm	230mm	290mm	330mm	365mm	460mm
The outer cylinder dia.	150/180/200mm			230mm	290mm	330mm	365mm	410mm	500mm
The height of the reactor	250/280/300mm			400mm	450mm	550mm	730mm	850mm	
Middle flange port	40#			50#					60#
Gear motor power(W)	60			90	120		140	180	250
pressure(Mpa)	-0.096								
Agitator speed(rpm)	0-600								
Condenser	24#			29#	34#			40#	
Constant pressure funnel	250ml/24#			500ml/29#	1000ml/34#	2000ml/34#		3000ml/34#	5000ml/29#
Charging piston	29#				40#				
Solid feed inlet	-				DN80				
Electronic temp. measurement port	DN15								
Discharge flange port	38#			50#	60#	70#			100#
PTFE	Ø8			Ø10	Ø16			Ø18	Ø20
Gear motor	60W			90W	120W			180W	250W
Power (V/Hz)	220/50 or 60								



### REF-113ATC, Hand Refractometer, 0–32% Brix/ATC

Designed to measure sugar content. Just a few sample drops are enough to determine the percentage of dissolved solid, according to the principle for which the refraction index of a solid dissolved is proportionate to its concentration. This is a simple and accurate method, extremely useful for controlling the quality of fruit, jam, vegetables, tomatoes, beet sugar, canned foods, etc., in the field or in the factory. This new revolutionary instrument allows to measure without problems due to temp. changes, eliminating the inconvenient of temperature compensation. until now indispensable for refractometric measuring operations.

Model	Range	Precision
REF-113ATC	0–32% Brix/ATC (10°C–30°C)	0.2%



### REF-104, Hand Refractometer, 28–62% Brix

Ideal for concentrated fruit juices and canned foods that use sugar infusion, and half-scale concentration samples. In the bright/blue field, the boundary line is clearly visible with good contrast.

Model	Range	Precision
REF-104	28–62% Brix/ATC	0.2%



### REF-105, Hand Refractometer, 45–82% Brix

Standard refractometer used to measure the sugar content of concentrated fruit juices, condensed milk, liquid sugar and marmalade, and for very dense products, jams, syrups, concentrated substances, glucose, treacle.

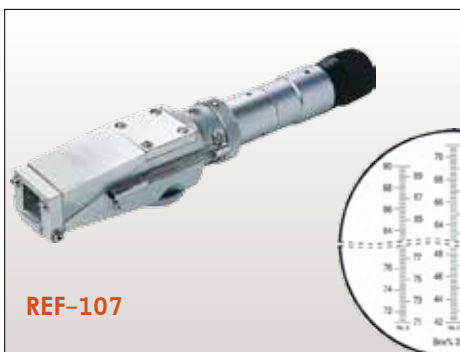
Model	Range	Precision
REF-105	45–82% Brix	0.5%



### REF-116, Hand Refractometer, 58–90% Brix

Designed to measure the common indexes of HONEY: high sugar content, Baume and water. It determines the percentage of water in the honey by measuring the refraction index. It permits the determination of the collecting period, conservation and commercial value. Useful for preparing the spring mixtures of the bees.

Model	Range	Precision
REF-116	58–90% Brix	1% Brix
	38°Bé–43°Bé	0.5°Bé
	12–27% water	1% water



### REF-107, Hand Refractometer, 0–90% Brix

It precisely determines the sugar content of each solution; suitable for all products, both diluted & concentrated. It adopts a light transmission system to increase the contrast of the boundary line in the field of vision.

The Amici prism, inside situated, has been made to eliminate color, so as to obtain a clear boundary line in the field of vision. Thanks to the special thermometer with which it is equipped, the measurements can be easily corrected by the relative tables.

Model	Water percentage	Precision
REF-107	0–90% Brix	0.2%
	3 Ranges: 0–42%; 42–71%; 71–90%	



### REF-117, Hand Refractometer, 12–27% Brix

Refractometer for honey, for quickly determination of the percent age of water in the honey and relevant Baumé degree. Manual temperature compensation between 20°C and 40°C.

Model	Water percentage	Precision
REF-117	12–27%	0.2%
	Baumé range	
	38°Bé–43°Bé	1°

# REFRACTOMETERS Hand



## REF-108, Hand Refractometer, 0–80% Brix

Universal broad-scale refractometer, able to precisely determine the sugar content of all kinds of products. Selnable scales between 0 and 80° Brix.

Model	Range	Precision
REF-108	0–80% Brix	1%



## REF-111, Hand Refractometer, 0–10% Brix

The REF-111 model features an enlarged Brix scale making possible high-precision measurements. It can be used to measure the Brix degree in fruit juices, emulsion oils, lubricating oils and all low-concentration substances, with Brix degree of 10% or lower.

Model	Range	Precision
REF-111	0–10% Brix	0.1%



## REF-112, Hand Refractometer, 0–18% Brix

The model with high-resolution Brix scale has been developed for low concentrations. The scale can measure the Brix degree in fruit juices, soft drinks, must wine and various types of drinks, lubricating oils, emulsion oils, tomato, etc.

Model	Range	Precision
REF-112	0–18% Brix	0.1%



## REF-113, Hand Refractometer, 0–32% Brix

Designed to measure sugar content. Just a few sample drops are enough to determine the percentage of dissolved solid: according to the principle for which the refraction index of a solid dissolved is proportionate to its concentration. This is a simple and accurate method, extremely useful for controlling the quality of fruit, jam, vegetables, tomatoes, beet sugar, canned foods, etc., in the field or in the factory.

Model	Range	Precision
REF-113	0–32% Brix	0.2%



## REF-212, Hand Refractometer, 0–28% Brix Salinity

Refractometer able to determine the percentage of sodium chloride in sea water and in prepared-food solutions. with salt concentration up to 28%. meaning 28g of salt in 100g of solution. Suitable for controlling refrigerating brines. for food treatment liquids used in the processing industry. for brackish and sea water. Instrument calibrated to the refraction index of sodium chloride.

Model	Range	Precision
REF-212	0–28% Brix salinity	0.2%



## REF-211, Hand Refractometer, 0–100‰ Brix Salinity

It measures low-concentration salt content. It adopts scale with unit of salinity per thousand (‰). The refractometer is easy to use and quickly provides the direct measurement of saline density and the specific weight of sea water.

Model	Range	Precision
REF-211	0–100‰	1‰
	1000–1070 sg	0.001 sg



### REF-311, Hand Refractometer, 0-12g/dl Proteins & Urine

This high-precision and widely-used model has been designed to quickly determine the proteins in blood serum & the specific weight of urine; indispensable for all chemical-clinical test laboratories.

Model	Range	Precision
REF-311	0-12g/dl	0.2g/dl
	1000-1040 sg	0.002 sg



### REF-312, Hand Refractometer, 0-12g/dl Proteins & Urine

Widely used in chemical-clinical test laboratories to determine the proteins in blood serum and the specific weight of urine.

The instrument also features refraction index scale (Nd), to determine the concentration of test reagent solutions, and calibration line (Wt) for instrument control.

Model	Range	Precision
REF-312	0-12g/dl	0.2g/dl
	1000-1050 sg	0.002 sg
	1.3330-13600 RI	0.0005 RI



### REF-414, Hand Refractometer, Measuring The Freezing Point

It permits measuring the freezing point of glycol ethylene and propylene solutions. Especially suitable for controlling lead battery charges & concentration of heat exchange liquid in cooling systems.

Model	Range	Precision
REF-414	0°C/-50°C	5°C
	1.15-1.30 sg	0.01 sg



### REF-513, Hand Refractometer, Alcohol

It permits measuring the approximate value of the amount of alcohol in aqueous solutions and the sugar content of grape juice. The scale directly shows measurement results.

Model	Range	Precision
REF-513	0-25%	0.2%



### REF-711, Hand Refractometer, 0-26% Babo

Manual instrument indispensable for all grape growers and wine-making industries. It features 3 measurement scales (Brix, Babo, Oechsle), for the quick sight determination of the sugar content of grapes & musts.

Model	Range	Precision
REF-711	0-26% Babo	0.2%
	0-140 °Oechsle	1°
	0-32% Brix/ATC	0.2%



### REF-601A, Hand Refractometer, Gemology

Used to measure the refraction index in gemology. It features inner protection for the light, to obtain enough lighting for measuring, and polarizer filter.

Model	Range	Precision
REF-601A	1.30-1.81	0.01

## K7135, ABBE Refractometer



K7135

### Standard accessories:

- Calibrating glass prism
- Monobromonaphthalene standard, bottle
- Stabilised mains adapter
- Calibrating screwdriver
- Dust cover.

### BRIX Scale (%):

The Brix degree measures the concentration percentage of soluble solid content of a sample (aqueous solution), i.e. the sum of all the solids dissolved in the water (sugar, salt, proteins, acids, etc.); the measurement result is their sum in the sample. Basically, the Brix degree is calibrated to the grams of cane sugar contained in 100 g of solution. For this reason, when a sugar-based solution is measured, the Brix degree precisely calculates real concentration. In the event of the substance to be examined also containing other components different from sugar, a referment should be a conversion table, so as to correct the obtained values and make sure the result represents the exact sample concentration.

### Uses:

Projection Abbe Refractometer is a kind of instrument which can be used to determine the refractive index  $n_D$  and the mean dispersion  $n_F - n_C$  for the transparent or semitransparent liquid or solid (mainly used to determine the transparent liquid).

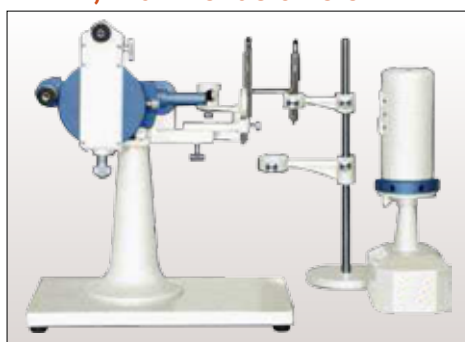
With the help of thermostat, this instrument may be used to determine the refractive index  $n_D$  for the substance within the temp. range from 0°C to 50°C The refractive index & the mean dispersion are important optical constants; with which the optical property of purity, concentration & dispersion power, etc. can be determined for a certain substance. Therefore, this instrument has been used widely; it is an indispensable common one used in the industries of chemicals, grease, pharmacy, painting, food processing, sugaring, etc. by relevant factories, colleges, and scientific research institutes.



### Specifications:

Model	K7135
<b>Refractive index (<math>n_D</math>) measuring:</b>	
Measuring range	1.300 ~1.700
Scale unit	0.0005
Measuring accuracy	0.0003
<b>2 Measurement for the concentration of sugar solution:</b>	
Measuring range	(0 ~95)%
Scale unit	0.25%
Illuminating lamp	High intensity LED
Temperature range	0°C ~50°C
Instrument weight	6.5Kg
Dimensions (mm)	370x240x440

## REF-PR, Prism Refractometer



### Measurement range:

Refractive index $n_D$ for solid substances	1.30-1.95
Refractive index $n_D$ for liquid substances	1.30-1.70
<b>Accuracy:</b>	
Refractive index $n_D$	$\pm 5 \times 10^{-5}$
Wavelengths:	706.5, 656.3, 589.3, 587.6, 546.1, 486.1, 435.8, 404.7nm
Weight (Gross):	80 kg
Overall Dimensions:	720x550x560mm

### Characteristics:

- Measurement of refractive index, average or partial dispersion of transparent or semi-transparent liquid and solid substances.
- An instrument essential for manufacturers of optical instrument & scientific research institutes & schools of higher learning
- Visual aim, quick measurement, high precision and easy to operate.

### Standard Concentration of Known Substances:

	Concentration %	
<b>Fruit Fruit Juice</b>	Oranges, pears	6-13
	Tomato	3-6
	Apples, melons	12-18
	Strawberries, peaches	6-12
	Grape seeds	13-24
	Concentrated fruit juices	42-68
	Fruit juice	12-18
	Strained tomato	7-16
	Tomato juice	5-9
	Aerated drinks	6-15
	Nectars	16-23
	Drinks with lactic acid	16.5-21.5
<b>Foods</b>	Condensed milk	52-68
	Liquid sugar	58-80
	Canned fruit	14-28
	Egg yoke	45-48
	Milk	12-17
	Marmalade, flour	60-70
	Vegetable oils	57-90
<b>Industry</b>	Oily emulsions	0-7
	Oils for soluble temper	0-20



**RA-130**

**Applications:** Measurement of sucrose concentration of fruit juices • Measurement of sucrose concentration of jam and honey • Brix measurement on beverages • Brix measurement on liquid seasonings • Concentration control on pharmaceutical & medical liquid samples.

**RA-130, Portable Refractometer Datalogger**

**Features:**

- Wide measuring range: Brix 0~85% Refractive index 1.3200~1.5000
- Data storage: Up to 1100 measurements results
- Data transfer to your computer by supplied software via infrared port. Can also output via RS232C with RS converter for infrared (Option).
- Can display measurement results in Refractive Index (RI), Temperature compensated RI, Brix % and the like.
- Automatic data saving and Automatic data output can be chosen.
- Three different sucrose conversion tables Brix and isomerized sugar HFCS42, HFCS55.
- Data can be converted to user-defined concentration and the unit can be used as a concentration meter.

Model	RA-130
<b>Measurement method</b>	Optical detection of critical angle with Na-D line
<b>Measurement objects</b>	Liquids such as water solution like fruit juices or soft drinks and organic solvents
<b>Measurement range</b>	nD 1.32 ~ 1.50 Brix 0 ~ 85% HFCS42 0 ~ 76% HFCS55 0 ~ 80%
<b>Accuracy</b>	nD ±0.0005 Brix ±0.2% HFCS42 /55 ±0.2%
<b>Resolution</b>	nD 0.0001, Brix 0.1%, HFCS42 /55 0.1%
<b>Temperature range</b>	10 ~ 40°C
<b>Display contents</b>	Refractive index, Temp. comp. RI, Brix, HFCS42, HFCS55 and Temperature (°C/°F). Sample number, Data storage, Data output, Data deletion, Battery alarm and the like.
<b>Temperature compensation</b>	Up to 10 kinds of input for temp. compensation coefficients of measured samples and Compensation temperatures
<b>Data storage</b>	1,100 measurement results
<b>External output</b>	Computer or printer (either, not both) can be connected • IrDA connection is standard supplied • RS232C connection requires optional RS converter for infrared (#029-0007)
<b>Weight</b>	Approx. 200g
<b>Power source</b>	DC 3V (2 x 1.5V alkaline AAA dry cells)
<b>Battery life</b>	60 hours (one measurement in one minute)
<b>Sampling method</b>	2 ways selective – Dipping or Dripping method available



**REF-85**

The REF-85 – digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements in the field. The measurement technique & temp. compensation employ methodology recommended in the ICUMSA Methods Book (Internationally recognized body for Sugar Analysis). Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual level display along with icons for Low Power and other helpful message codes.

**Key features include:** Dual-level LCD • Automatic Temp. Compensation (ATC) • Easy setup & storage • Battery operation with Low Power indicator (BEPS) • Automatically turns off after 3 minutes of non-use.

**REF-85, Portable Refractometer**

The REF-85 – is an optical instrument that employs the measurement of refractive index to determine the % Brix of sugar in aqueous solutions. The method is both simple & quick. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds the instrument measures the refractive index of the sample and converts it to % Brix concentration units.

Model	REF-85	
<b>Range</b>	0 to 85% Brix	0 to 80°C / 32 to 175°F
<b>Resolution</b>	0.1% Brix	0.1°C / 0.1°F
<b>Accuracy</b>	±0.2% Brix	±0.3°C / ±0.5°F
<b>Light Source</b>	Yellow LED	
<b>Measurements Time</b>	Approximately 1.5 seconds	
<b>Min. Sample Volume</b>	100 µL (cover prism totally)	
<b>Sample Cell</b>	SS ring and flint glass prism	
<b>Temp. Compensation</b>	Automatic between 10 and 40°C / 50 to 104°F	
<b>Case Material</b>	ABS	
<b>Enclosure Rating</b>	IP 65	
<b>Battery Type</b>	1 x 9V AA (included)	
<b>Battery Life</b>	5000 reading	
<b>Auto-shut off</b>	after 3 minutes of non-use	
<b>Dimensions</b>	192x102x67mm	
<b>Weight</b>	420g	



REF-A61/62/65

REF-A65 Auto Refractometer includes built-in Peltier precise temperature control system and high-performance CCD light-sensitive part, can accurately and efficiently complete sample analysis tests through exclusive signal acquisition, analysis and processing technology. REF-A65 can automatically measure the refractive index (nD) of transparent or translucent liquids and mass fraction (Brix) of sugar solution, is accurate, reliable, quick, easy for operation, and so on.

### Characteristics:

- High-resolution CCD detector offers automatic measurement, avoiding personal errors, having higher accuracy.
- With standard interface, can connect heating equipment.
- Measuring prism is made of high hardness sapphire glass, of excellent properties against corrosion & scratches, free for clean and durable.
- High brightness LED lights with long service life.
- Extremely large storage capacity can store up to 1000 groups of data information automatically.
- Exclusive signal acquisition, analysis and processing technology ensures accurate measurement results.
- Large color touch screen display and innovative WINDOWS software interface give extremely convenient device operation and data acquisition.
- External USB and RS232 ports can be directly connected to PC; USB disk and SD card interfaces are easy for data export and backup.

### Characteristics:

- High-resolution CCD detector offers automatic measurement, avoiding personal errors, having higher accuracy.
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- External USB and RS232 ports can be directly connected to PC; USB disk and SD card interfaces are easy for data export and backup.

## REF-A65, Automatic Refractometer

### Characteristics:

- High-resolution CCD detector offers automatic measurement, avoiding personal errors, having higher accuracy.
- Peltier accurate temperature control system is built in.
- Measuring prism is made of high hardness sapphire glass, of excellent properties against corrosion and scratches, free for clean and durable.
- High brightness LED lights.
- Extremely large storage capacity can store up to 1000 groups of data information automatically.
- Exclusive signal acquisition, analysis and processing technology ensures accurate measurement results.
- Large color touch screen display and innovative WINDOWS software interface give extremely convenient device operation & data acquisition.
- External USB and RS232 ports can be directly connected to PC; USB disk and SD card interfaces are easy for data export and backup.

Model	REF-A65
<b>Refractive index range(nD)</b>	1.3000-1.7000
<b>Measured value error(nD)</b>	±0.0002
<b>Measurement resolution(nD)</b>	0.0001
<b>Rang of sugar solution mass fraction(Brix)</b>	0-95%
<b>Measured value error(Brix)</b>	±0.1%
<b>Measurement resolution(Brix)</b>	0.1%
<b>Temperature display range</b>	0-50°C
<b>Temperature range</b>	15°C-30°C
<b>Temperature resolution</b>	0.1°C
<b>Power supply</b>	220V, 50Hz

## REF-A62, Automatic Refractometer

REF-A62 Auto Refractometer includes high-performance CCD light-sensitive part, can accurately and efficiently complete sample analysis tests through exclusive signal acquisition, analysis and processing technology. REF-A62 can automatically measure the refractive index (nD) of transparent or translucent liquids and mass fraction (Brix) of sugar solution, is accurate, reliable, quick, easy for operation, and so on.

Model	REF-A62
<b>Refractive index range (nD)</b>	1.3000-1.7000
<b>Measured value error (nD)</b>	±0.0002
<b>Measurement resolution (nD)</b>	0.0001
<b>Rang of sugar solution mass fraction (Brix)</b>	0-95%
<b>Measured value error (Brix)</b>	±0.1%
<b>Measurement resolution (Brix)</b>	0.1%
<b>Temperature display range</b>	0-50°C
<b>Power supply</b>	220V, 50Hz

## REF-A61, Automatic Refractometer

REF-A61 Auto Refractometer includes high-performance CCD light-sensitive part, can accurately and efficiently complete sample analysis tests through exclusive signal acquisition, analysis and processing technology. REF-A61 can automatically measure the refractive index (nD) of transparent or translucent liquids and mass fraction (Brix) of sugar solution, is accurate, reliable, quick, easy for operation, and so on.

Model	REF-A61
<b>Refractive index range(nD)</b>	1.3000-1.7000
<b>Measured value error(nD)</b>	±0.0002
<b>Measurement resolution(nD)</b>	0.0001
<b>Rang of sugar solution mass fraction(Brix)</b>	0-95%
<b>Measured value error(Brix)</b>	±0.1%
<b>Measurement resolution(Brix)</b>	0.1%
<b>Temperature display range</b>	0-50°C
<b>Power supply</b>	220V, 50Hz





**HYC-260L/300L**

**Model: HYC-260L/300L , Upright Type**  
**Effective Capacity: 260/300Liter**  
**Temperature range: +2°C ~ +10°C**



**Features:**

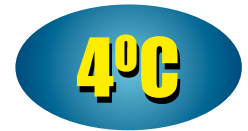
- Upright type.
- Temperature ranging from +2 to +10°C, can be set freely, controlling precision 1C, display accuracy 0.1C.
- Combined with two exact sensors and one sensors to defrost.
- 2-layer glass door, and inert gas inside.
- Room temperature can be ranging from 0°C to 32°C.
- Forced air circulation system with intelligent control.
- Audible and visual alarm: High or low temperature alarm, Door ajar alarm,system failure alarm.
- 4units Caster are mounted under the bottom.
- Interior florescent lighting.
- 5units shelves made of quality steel wire.
- Exterior made from high quality structural plate, interior made from ABS material.
- China good quality compressor (1 unit) and fan motor.
- Optional : temperature printer.
- Refrigerant as R134a, CFC free.
- Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- Certificate: ISO9001, ISO14001,ISO13485.

Model	Capacity	External size (mm)	Internal size (mm)	Input power	Weight (N.T/G.T)
<b>HYC-260L</b>	260 Liters	D590xW603xH1556	D445xW525xH1070	215	77Kg/105Kg
<b>HYC-300L</b>	300 Liters	D590xW603xH1728	D445xW530xH1265	215	86Kg/110Kg



**RXC-240L/280L**

**Model: RXC-240L/280L,Upright Type**  
**Effective Capacity: 240/280Liters**  
**Temperature range: 4±1°C.**



**Features:**

- Temp. range should have 4±1°C, with temp. printer standard.
- Vertical cabinet (upright).
- Polyurethane insulation should be minimum 80-95 mm.
- Microprocessor-based temperature control system.
- Forced air circulation system.
- Automatic temperature control.
- Large screen LCD display of temperature, display accuracy of 0.1°C.
- Digital display of upper and lower temperature, two sensors. Perfect Audible/visual alarm system: High/low temperature alarm, system failure alarm.
- Exterior made from high quality steel plate.
- 2-ply transparent door with heat preservation.
- Inner doors with 5 units wire shelves.
- Interior florescent light.
- The high-effective air-cooled condenser and the fin-type evaporator.
- Refrigerant as R134a, CFC free.
- Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz.
- Certificate: ISO9001, ISO14001, ISO13485.

Model	Capacity	External size (mm)	Internal size (mm)	Input power	Weight (N.T/G.T)
<b>RXC-240L</b>	240 Liters	D615xW605xH1615	D445xW525xH1070	500	96Kg/105Kg
<b>RXC-280L</b>	280 Liters	D615xW605xH1780	D445xW530xH1265	500	105Kg/110Kg



**Models: HYC-520L/950L/1400L, Upright Type**  
**Effective Capacity: 520/950/1400 Liters**  
**Temperature: +2 to +10°C**

**Features:**

Upright type • Temperature ranging from +2 to +10°C, controlling precision 1°C, display accuracy 0.1°C, with temperature printer (Optional in 260L/300L) • Outer is steel board, inside is stainless steel • Fixed with two exact sensors and one sensors to defrost • Door with heater to prevent ice leak • Audible and visual alarm: High or low temperature alarm, Power failure alarm, Low battery • Two layer glass door, inert gas inside, alarm, Door ajar alarm, Filter blocking alarm, system failure alarm • 4 units Caster are mounted under the bottom • Interior fluorescent lighting • 8 units shelves made of quality steel wire soaked with plastic • Refrigerant as R134a, CFC free • Imported famous brand Danfoss compressor (unit) and EBM fan • Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz • Certificate: IS09001, IS014001, IS01348S.



Model	Capacity	External size (mm)	Internal size (mm)	Input power (W)	Weight (N.T/G.T)
HYC-520L	520 Liters	D730xW710xH2000	D670xW790xH1450	350	150Kg/160Kg
HYC-950L	950 Liters	D780xW1200xH1894	D600xW1100xH1400	700	180Kg/210Kg
HYC-1400L	1400 Liters	D895xW1558xH1985	D700xW1448xH1423	900	400Kg/420Kg



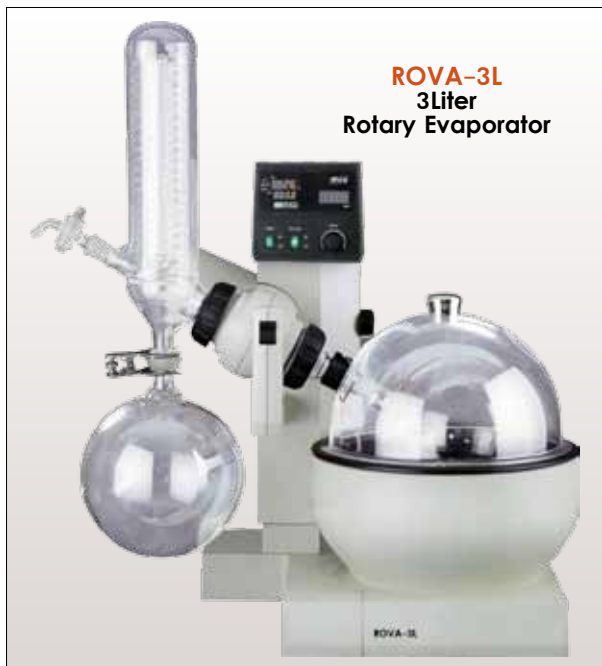
**Models: XC-88L/268L/358L/588L, Upright Type**  
**Effective Capacity: 88/268/358/588 Liters**  
**Temperature: 4°C**



Temperature range 4±1°C • Vertical cabinet (upright) • Polyurethane insulation is 80-95 mm • Microprocessor-based temperature control system, printer is standard • Forced air circulation system, defrost automatic • Large screen LCD display of temperature, display accuracy of 0.1°C • Digital display of upper and lower temperature • Perfect alarm system: Audible/visual alarm, High or low temperature alarm, No battery alarm, Door ajar alarm, Filter blocking alarm, system failure • Exterior made from high quality steel plate, inside is stainless steel • 3-layer transparent door with lock, door with heater around to prevent ice leak • Inner is drawer (stainless steel). 3units drawer for XC-88L, 4units for XC-268L, 5units for XC-358L, 6units for XC-588L • Interior fluorescent light • China good quality compressor (1 unit) and fan motor • The high-effective air-cooled condenser and the fin-type evaporator • Refrigerant as R134a, CFC free • Power supply: 220V/50Hz 1 phase, can change as 220V/60Hz or 110V/50Hz or 110V/60Hz • Certificate: CE mark, ISO9001, ISO14001, ISO13485 • Optional : chart recorder.

**Blood Bank**

Model	Capacity	External size (mm)	Packing size (mm)	Blood capacity
XC-88L	88 Liters	D500xW450xH1515	D402xW343xH663	450ml/bag x 40-50/bags
XC-268L	268 Liters	D700xW628xH1662	D512xW518xH973	450ml/bag x 100-140/bags
XC-358L	358 Liters	D700xW628xH1962	D512xW515xH1270	450ml/bag x 160-200/bags
XC-588L	588 Liters	D800xW760xH1977	D550xW560xH1260	450ml/bag x 250-280/bags



Heating chamber: Teflon compound chamber, it is a closed heater, power: 1.4 KW; Temperature is controlled automatically, digital display water temperature, room temperature ~ 90°C Total power: 1.5KW, voltage: 220V 50Hz Vertical condenser glassware: high-temperature-tolerant & high-quality glass. Double-circuit integrated ball joint with Receiving flask. Material in-flow: Material in-flow valve is connected with PTFE tube. Sealed gasket: fluorine rubber and vacuum; Main components: stainless aluminum, special ABS, high-temperature-tolerant and high quality glass having a good feature and long duration.

**Accessories:**

**CVP-13-1, Vacuum Pump**

Quiet operation, no vibration.  
 Long life PTFE diaphragm.  
 Vacuum regulator for easy adjustment.  
 Integral catch pots.  
 No maintenance dry system.  
 The vacuum pump is a powerful, chemically resistant pump which may ideally be employed for distillations with the rotary evaporators. Also useful for other applications.  
 Includes vacuum regulator and catch pots to protect pump from liquid ingress, as standard.

**WBL-100, Recirculation Cooler**

- Sufficient cooling power to run 2 evaporators simultaneously.
- Digital setting of temperature.
- Quiet operation.
- Powerful 450W cooling capacity.

The recirculating cooler offers powerful cooling for your condenser by accurately controlling the temperature of your cooling medium down to -20°C. A recirculating cooler is not only much more powerful than conventional water cooling, but is also an ideal alternative when water consumption is an issue for economical, environmental or practical reasons.  
 For more information please refer to the recirculating cooler section of this catalogue.

**ROVA-2L/3L, Rotary Evaporator**

Rotary evaporators are distillation units that incorporate an efficient condenser with a rotary flask system. As the flask containing the solvent is rotated it continually transfers a thin layer of liquid over the entire inner surface. This gives a very large surface area for evaporation that is effected by heating from the accessory water bath. They are the ideal tools for many everyday laboratory applications, including:

- Concentration of solutions
- Reclamation of solvents
- Vacuum drying of wet solids
- Degassing liquids

The rotating system is fitted with a special seal that allows the apparatus to be placed under vacuum. This reduces the boiling point of the solvents and removes the VAPOR phase making the process much more efficient. Each unit is also provided with an easy to use vacuum release and a continuous feed system, which allows more solvent to be drawn into the rotating Florentine flask without the need to stop the operation.

**Main body:** button with pressure, 0-150mm lifting and falling in a high speed automatically. The rotating speed: 20-200r/min; Digital display of the speed; power: 40W.

Model	ROVA-2L	ROVA-3L
<b>Volume (ml)</b>	25-2000	50-3000
<b>Heater</b>	1400W	
<b>Speed</b>	20-200 rpm	
<b>Water bath temp.</b>	Up to 90°C	
<b>Automatic lifter</b>	150mm	
<b>Power</b>	230V / 50Hz	

**Technical specification**

- Vacuum 13 mbar
- Flow rate 25 Liter/min
- Net weight 7kg
- Dimensions: W270xD144xD190mm
- Electrical supply 230V, 50Hz, 150W

**Optional: Vacuum pump**



**CVP-13-1**

**Technical Specifications**

- Cooling capacity 450W at 10°C
- Temperature range -30 to +100°C
- Control accuracy ±1°C
- Bath capacity 9 Liters
- Pump rate 9 Liter/min
- Net weight 32kg
- Dimensions: W300xD450xH630mm
- Electrical supply 230V 50Hz

**Optional: Cooler**



**WBL-100**

# ROTARY EVAPORATORS Professional, 2 Liter, up to 180°C

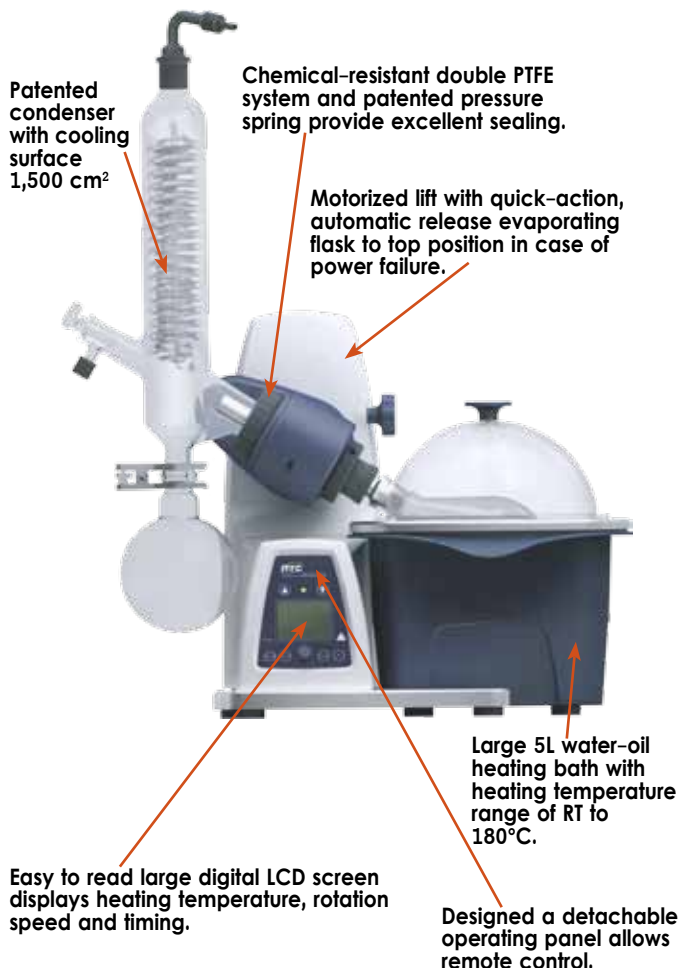


**ROVA-100**  
2Liter  
Rotary Evaporator

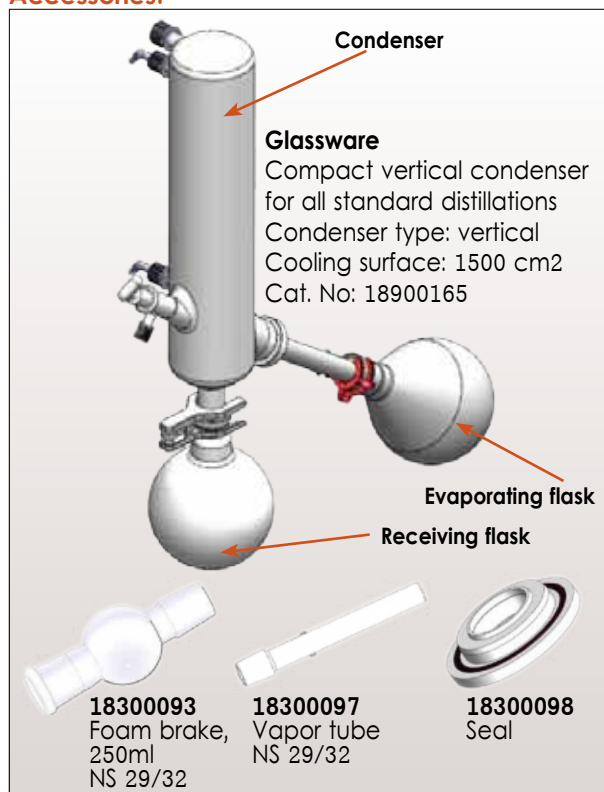
- Easy to read large digital LCD screen displays heating temperature, rotation speed and timing
- Speed range from 20 to 280 rpm
- Large 5L water-oil heating bath with heating temperature range RT to 180°C
- Heating bath with precise temperature control and adjustable safety circuit
- Designed a detachable operating panel allows remote control
- Patented condenser (cooling surface 1,500 cm<sup>2</sup>) with excellent cooling effect
- Motorized lift with quick-action, automatic release evaporating flask to top position in case of power failure
- Adjustable final position recognition to protect operator and sample against breakage
- Evaporating flask with an ejector, convenient to remove
- Available with timer function to precise control processing
- Chemical-resistant double PTFE system and patented pressure spring provide excellent sealing
- PC can control and document all parameters via RS232 interface (USB).

## ROVA-100, Digital Rotary Evaporator

Model	ROVA-100
Voltage (VAC)	100-240
Frequency (Hz)	50/60
Power (W)	1400
Motor Principle	DC brush less motor
Speed range (rpm)	20-280
Speed display	LCD
Reversible Direction of Rotation	Yes
Heating Temperature Range (°C)	RT-180
Heating Control Accuracy (°C)	±1
Heat Output (W)	1300
Temperature Display	LCD
Lift	Motor
Stroke (mm)	150
Timer	Yes
Timer display	LCD
Time setting range (min)	1-999
Overall Dimensions (D x W x Hmm)	420 x 400 x 580
Weight (kg)	20
Permissible ambient temperature (C)	5-40
Permissible relative humidity	80%
Protection class acc. DIN EN60529	IP20
RS232 interface	Yes



### Accessories:



**Condenser**

**Glassware**  
Compact vertical condenser for all standard distillations  
Condenser type: vertical  
Cooling surface: 1500 cm<sup>2</sup>  
Cat. No: 18900165

**Evaporating flask**


**Receiving flask**

**18300093**  
Foam brake, 250ml  
NS 29/32


**18300097**  
Vapor tube  
NS 29/32

**18300098**  
Seal



**CVP-13-1, Optional: Vacuum pump**

	<b>Pump Speed</b>	0 mmHg	25 L/min
		100 mmHg	22 L/min
		200 mmHg	20 L/min
		300 mmHg	12 L/min
		400 mmHg	7.5 L/min
		550 mmHg	5 L/min
		<b>Suction Nozzle Size(mm)</b>	8
<b>Motor speed (rpm)</b>	1450		
<b>Weight (kg)</b>	7		
<b>Noise (dB)</b>	50		




**WBL-100, Optional: Recirculating chiller**

	<b>Temp. range(°C)</b>	-30 - 100°C
	<b>Temp. stability(°C)</b>	±1.0
	<b>Temp. display</b>	LED
	<b>Pump capacity flow rate (l/min)</b>	9
	<b>Pump capacity flow pressure (bar)</b>	0.35
	<b>Filling volume (L)</b>	9
	<b>Weight (kg)</b>	32
	<b>Dimensions (W×L×H cm)</b>	30 × 45 × 63



### NS 29/32, Spiders with 5 flasks

Model	Volume
 <b>18300102</b>	50ml
 <b>18300103</b>	100ml

### NS 29/32, Connector

Model	Size
 <b>18300094</b>	24
 <b>18300095</b>	19
 <b>18300096</b>	14

### Ordering Information

Model	P/N	Description	Volume	Size
<b>Glassware</b>				
<b>18900165</b>		Glassware vertical	1000ml	-
<b>Flasks</b>				
<b>18300116</b>			50ml	NS 29/32
<b>18300117</b>			100ml	
<b>18300118</b>			250ml	
<b>18300119</b>			500ml	
<b>18300120</b>			1000ml	
<b>18300121</b>		2000ml		
<b>18300107</b>			100ml	KS 35/20
<b>18300108</b>			250ml	
<b>18300109</b>			500ml	
<b>18300110</b>			1000ml	
<b>18300111</b>			2000ml	
<b>18300112</b>			3000ml	
<b>18300102</b>		Spider	50ml	NS 29/32
<b>18300103</b>			100ml	
<b>18300094</b>		Connector	-	29x24
<b>18300095</b>			-	29x19
<b>18300096</b>			-	29x14
<b>18300093</b>		Foam brake	250ml	29x29
<b>18300097</b>		Vapor tube	-	NS 29/32
<b>Additional Accessories</b>				
<b>18100926</b>		Seal, Airtight lip-seal from a PTFE compound with a built-in stainless steel spring		
<b>CVP-13</b>	C410	Chemical resistant Vacuum Pump	220-240V, 50/60Hz	
<b>WBL-100</b>	F250	Recirculating chiller		

# ROTARY EVAPORATORS 5,6,10,20 Liter, up to 90°C



## ROVA-5L/6L/10L/20L, Digital Rotary Evaporators

- It is used in concentration, extraction, drying, recycling in large quantities, it is good for large production.
- Water/oil bath.
- Flask capacity between 5-20Liter.
- Automatic lifter 0-150 mm.
- Bath temperature range: ambient up to 90°C (optional: up to 180°C).
- High quality double glazed glass parts.
- PTFE viton gasket vacuum ring.
- Evaporation flask rotation speed 0-150 RPM with stepless RPM adjustment knob.
- Temperature accuracy,  $\pm 1^\circ\text{C}$  for water bath (and  $\pm 3^\circ\text{C}$  for oil bath).
- Digital temperature control.
- The outer body is made of stainless steel and non-rust Aluminum.
- Rapid warming bath, easy to clean,
- Voltage 220V/50Hz.



Model	ROVA-5L	ROVA-6L	ROVA-10L	ROVA-20L
<b>Volume</b>	3000-5000ml	250-6000ml	10Liter	20Liter
<b>Heater (Watt)</b>	1500		3000	5000
<b>Speed range (rpm)</b>	0 - 150		20 - 138	10-120
<b>Water/oil Bath temperature (°C)</b>	up to 90°C			
<b>Automatic lifter</b>	150mm			
<b>Overall Dimensions (mm)</b>	580 x 380 x 680	580 x 380 x 980	950 x 550 x 1650	850 x 520 x 1600
<b>Power</b>	220V / 50Hz			

\* 5Liter optional up to 180°C oil bath



### SI-1101, Rock, Rotate, or 3D Orbit Any Container

#### Features:

- Easily Converts from Rocking to Rotating (or vice versa) in just 5 seconds.
- Magnetic Stainless Steel Platform and Clip Plate System holds almost any container at any angle. Expansion kits available for increased capacity and different containers.
- Magnetic Strips hold bags for complete and even soaking of membrane-based blot assays/washings.
- Economical and Space-Saving.
- Ideal for Cold Rooms and Incubators. Maintains set speed between 0–38°C.
- Rocking Tray. 12 x 12 in. (300 x 300mm) holds large containers.
- Easily Cleaned or Decontaminated.
- Optional 3D Orbital Shaker Attachment.

Model	SI-1101
Supplied	Magnetic Platform, 1 Clip Plate each for 10–13mm, 15–17mm, and 28–30mm Tubes, 4 Bag Mounting Strips, and Non-Skid Tray
Speed	5–35 RPM
Rocking/Angle	10–70 cycles per minute/ ±10 degrees from horizontal
Platform Capacity	4.5 kg
Overall Dimensions (D x W x H)	252 x 508 x 267mm, Depth with Rocker Tray – 305mm
Weight	11.8 kg
Environmental	Installation Category 2.0° – 38°C, (32–100°F) 95% max. relative humidity

#### Accessories: (more information in pages 584–585)

Image	Model	Description
	SI-1123	<b>Expansion Kit (Two Stainless Steel Trays, 24 Magnetic Bag Mounting Strips):</b> Two stainless steel Trays and 24 magnetic Bag Mounting Strips used to attach sealed bags to the Magnetic Platform (Part No. 0A-1100-030) for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie for increased bag capacity.
	0A-1100-001	<b>Metal Rocker Tray:</b> The Non-Skid Tray for the Roto-Shake Genie attaches to the Magnetic Platform (Part No. 0A-1100-030) to rock open containers. The Non-Skid Tray measures 305 x 305mm (12 x 12in) and is included with the Roto-Shake Genie.
	SI-1150	<b>3-D Orbital Shaker Attachment For Roto-Shake Genie:</b> The 3-D Orbital Shaker Attachment for the Roto-Shake Genie provides gentle yet thorough mixing of dishes, flasks, beakers and open containers. It moves at a 5 degree angle through a 360 degree rotation (providing a combination of vertical and horizontal motions). This means that every corner or crevice of a container will receive complete mixing, making it the perfect choice for applications such as gel & blot staining/blocking, sample washing, polymer resin preparation, and more. Please note, platform capacity is 1 Kg (2.2 lb).
	SI-1170	<b>Stackable Tray for Roto-Shake Genie:</b> A tall non-skid metal tray that can be stacked onto the Roto-Shake Genie's existing tray (supplied with product) to ROCK various containers including T-flasks, petri dishes, boxes, and sealed bags, increasing the capacity for rocking by double-stacking two trays. The stackable tray measures 305 x 305mm (12 x 12in) and CAN ONLY be stacked on the non-skid tray (0A-1100-070) supplied with product.
	SI-1175	<b>Horizontal Orbital Shaker Attachment for Roto-Shake Genie:</b> This accessory adds horizontal orbital shaking capability to the Roto-Shake Genie with variable speed of 15–100RPM, which is ideal for Western Blots and for maintaining cells or solutions in suspension. Simply remove the Magnetic Platform from the Roto-Shaker Genie and attach the Horizontal Orbital Shaker Attachment. No tools required. Fits all new and existing Roto-Shake models.



SI-2101

SI-2201

**SI-2101, SI-2201, Rugged and Versatile Lab Rotator****Features:**

- Holds a wide variety of tubes, flasks, microplates, bags, and odd-shaped vessels at any angle.
- Available in two INTERCHANGEABLE platform configurations.
- Standard platform is designed to turn 90 degrees allowing different mixing motions.
- Magnetic platform features unique spring clip plate system.
- Designed for cold room and incubator use. Will easily fit in most incubators.
- Uniquely designed for a wide selection of motions, which can be adjusted from gentle rolling to forceful end over end mixing.
- Continuous-duty quality motor provides smooth, quiet operation.



SI-2101




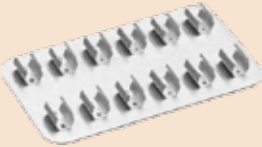

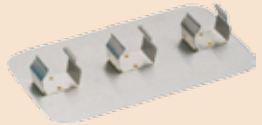






SI-2201

Model	SI-2101 / SI-2201
Supplied	Standard Platform with Retaining Bands / Magnetic Platform
Speed	5-35 RPM
Overall Dimensions (W x D x H)	400 x 175 (290 platform horizontal) x 400 mm
Platform Dimensions	Standard Platform: 260 x 260 mm / Magnetic Platform: 290 x 315 mm
Weight	5.2 kg
Environmental	Installation Category 2, 0° - 38°C, 95% max. relative humidity

**Accessories:**

Image	Model	Description
	SI-2110	<b>Standard Platform With Bands (only for SI-2101/2201):</b> Standard Platform with Bands. Supplied with SI-2101. Can also be used on SI-2201.
	SI-2210	<b>Magnetic Platform (only for SI-2101/2201):</b> Magnetic Platform. Supplied with SI-2201. Can also be used on SI-2101. Will accept a variety of clip plates sold separately.
	SI-1120	<b>6 Clip Plates For 12 Each 10-13mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 12 tubes with a diameter of 10-13mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie, or Incubator-Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1121	<b>6 Clip Plates For 6 Each 15-17mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 6 tubes with a diameter of 15-17mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.



Image	Model	Description
	SI-1122	<b>6 Clip Plates For 3 Each 28–30mm Tubes:</b> Pack of 6 metal clip plates to accommodate up to 3 tubes with a diameter of 28–30mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. A maximum of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1123	<b>Clip Plate 10–13mm Tubes:</b> One metal clip plate to accommodate up to 12 tubes with a diameter of 10–13mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie & the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1124	<b>Clip Plate 15–17mm Tubes:</b> One metal clip plate to accommodate up to 6 tubes with a diameter of 15–17mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie & the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1125	<b>Clip Plate 28–30mm Tubes:</b> One metal clip plate to accommodate up to 3 tubes with a diameter of 28–30mm. A maximum of 8 clip plates, 4 per side, may be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator-Genie. This attachment is included in the Roto-Shake Genie, Enviro-Genie and the Incubator-Genie. A max. of 12 clip plates, 6 per side, may be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1126	<b>Magnetic Stainless Steel Bag Strip (pack of 16):</b> Tube Holder holds six 50mL tubes vertically. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-1130	<b>2 Clip Plates For Hybridization Tubes:</b> Pack of 2 metal clip plates to accommodate one 35mm ID Hybridization Tube up to 300mm in length. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie.
	SI-1134	<b>2 Universal Clip Plates:</b> Pack of 2 clip plates with two elastic bands each for use with odd-shaped sample vessels. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie.
	SI-1135	<b>1 Magnetic Covered 100 Microtube Box:</b> Plastic box with hinged lid holds up to (100) 1.5ml or 2.0ml microtubes. A maximum of 4 boxes, 2 per side, can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Enviro-Genie or Incubator Genie. A maximum of 8 boxes, 4 per side can be attached to the Magnetic Platform for use with the Rotator Genie.
	SI-1136	<b>1 Clip Plate For 100ml Volumetric Flasks:</b> Metal clip plate to accommodate up to 4 100–ml Volumetric Flasks. This can be attached to the Magnetic Platform for use with the Roto-Shake Genie, Rotator Genie, Enviro-Genie or Incubator-Genie.
	SI-1137	<b>Dual Port Mixing Tube:</b> A V-shaped glass tube with dual ports, which attaches magnetically to the Roto-Shake Genie, Rotator Genie, Enviro-Genie and Incubator-Genie using clip plate accessory SI-1130 (sold separately). Ideal for use in the rotating mode for mixing dry ingredients.



RM-2M

### RM-2M, Rotator, Vortex, Blotter

Market leading unique device designed to handle each and every type of test tube mixing with brilliant efficiency! No other device on the market can deliver the same efficiency processing small 0.5 ml test tubes and only one push of a button away run 50 ml tubes blotting then vortex 42 eppendorf tubes simultaneously! This has become possible thank to the intelligent patented digital driver that utilizes the power of world's most advanced stepper motor and allows to program various cycles of mixing, vibrating and rotating.

- 18 Preset programs of mixing for various test tubes.
  - 2 Variable vortexing frequencies.
  - 3 Custom programs that user can design and save in a flash memory
  - 2 Specially designed blotting modes for Western blot protocol. Patented guaranteed efficiency!
- Supporting all test tubes from 0.5 ml up to 50 ml.  
Standby mode for power saving 12 Volts - safe power.

### RM-2M, Technical specifications:

Rotation speed	1 - 99rpm
Rotation speed settings step	1rpm
Overall number of operation regimes	34
Environmental temp.	4 - 50°C
Relative air humidity (at 20°C)	up to 80%
Power supply adaptor	DC 12V, 1.5 A

### 12 Rocking modes - Preset mix programs

Super powerful stepper motor drive and specially designed rocking program insures the best performance and comfort in all the applications that require rocking. The speed controller automatically switches from RPM to Shakes Per Minute scale to insure the best control and reproduction. Special Rocking platform with anti-slippery finish will provide enough space for loading all sort of samples. Platform design insures that no overturn can happen even when the power supply failure.



Mixer



### Accessories:

Test tube Dia.	Num. of test tubes in the rack
8-11mm	32
13mm	28
16mm	16
30mm	10

### 15 Mix modes - Automated intelligent mixing programs

This Mixer can perform as rotator, rocker, vortex mixer as well as blotter, device for immunoprecipitation and many other applications.

Thanks to state of art intelligent drive system "V-spin" & a complete range of test tube holders (racks) the machine can mix any tubes from 0.2 to 50ml.

The range of mixing vibrations can be easily adjusted from gentle rocking up to full efficiency vortexing. Using 31 in-build and 3 customizable programs can insure that any type of samples of various density or any other property can be mixed equally good.



Vortex



Rocking Platform

up to 12x30mm places Blotting and Hybridization rack

### 4 Blotting modes - Ultrasonic patented vibration

- **better sensitivity:** according to our studies, the sensitivity of the method is up to 20 times higher
- **higher specificity:** reduces cross-reactivity up to 4 times
- **faster procedure:** the method is 3 to 5 times faster
- **significant economy:** the usage of reagents is up to 12 times less. In case of expensive or unique antibody it may play a crucial role in you experiments.



Blotter



TMO-1650

**TMO-1550/1650, Rotators**

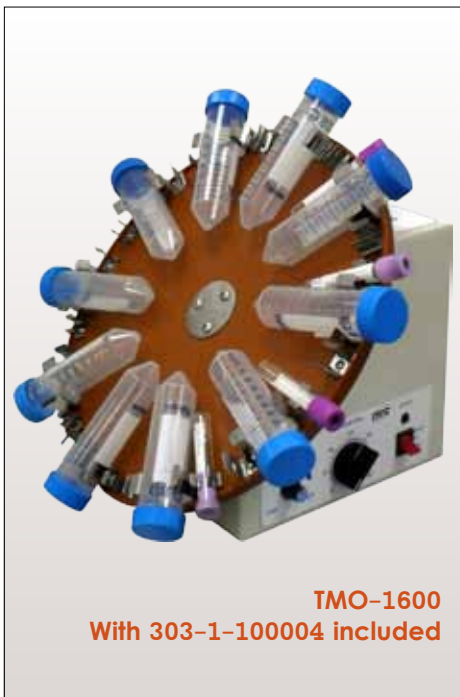
**Features:**

- Give gentle but effective mixing of biological samples
- Compact space-saving design fits easily in incubator and low temp. Chamber
- Used with a wide variety of accessories, available of micro tubes from volume range of 1.5ml-50ml
- Adjustable speed range of 0 to 80 rpm
- Rotator capacity:
  - 1.5ml X 48
  - 15ml X 16
  - 50ml X 8.



TMO-1550

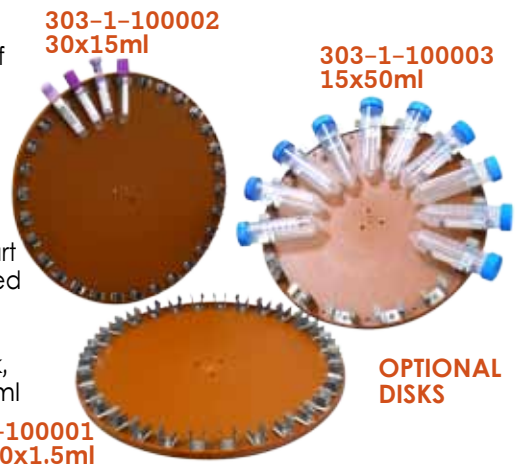
Model	TMO-1550	TMO-1650
Voltage (AVC)	100-240	
Frequency (Hz)	50/60	
Motor rating input (W)	16	
Motor rating output (W)	10	
Speed range (rpm)	0-80	
Shaking motion	Orbital	
Dimensions (W×H×D mm)	220X310X300	150X530X190
Weight (kg)	2.0	1.7
Permissible ambient temperature (°C)	5-40	
Permissible relative humidity	80%	



TMO-1600  
With 303-1-100004 included

**TMO-1600 Series**

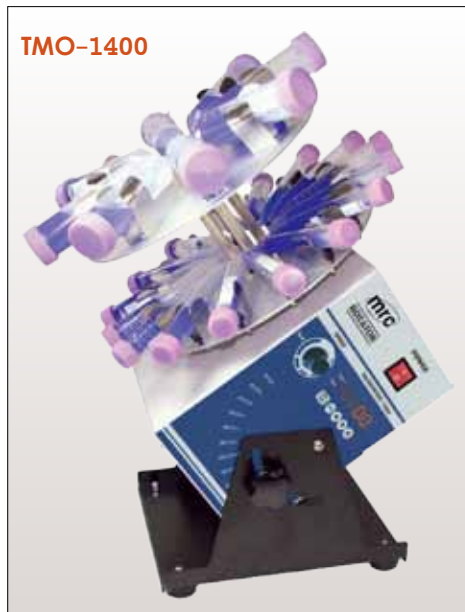
- Features:** Suitable for mixing of blood and culture samples • 360° rotating action • Continuous or timing operation (0-30 minutes) • Fixed mixing angle at 45° • Easy to load & unload the tubes • Adjustable speed • Smooth start and change of the stirring speed • Durable construction for long term operation • 3 Different disks (optional) • Included: Disk, 10x1.5ml & 10x15ml & 10x50ml tube holders.



OPTIONAL DISKS

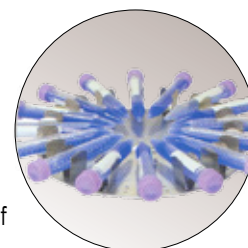
Model Number	Disc Description
303-1-100001	Disk, 30x1.5ml tube holders (Optional)
303-1-100002	Disk, 30x15ml tube holders (Optional)
303-1-100003	Disk, 15x50ml tube holders (Optional)
303-1-100004	Disk, 10x1.5ml & 10x15ml & 10x50ml tube holders (Included)

Model	Angle Range	Speed Range (rpm)	Disc size (mm)	Net Weight	Dimensions (mm)	Power
TMO-1600	Fixed 45°	10~100	Ø 300	4.8kg	W250xD300xH250	AC 110V/60Hz or 220V/50Hz

**TMO-1400****TMO-1400, Rotator**

MRC tube rotator TMO-1400 is recommended for extractions, tissue culture specimens, dissolving slow reacting samples and resuspending blood solids in plasma. This unit comes equipped with a digital tachometer and timer along with a variable speed drive (10 – 50 rpm) that provides uniform rotary motion. Includes simple system for adjusting position of the tube adaptor in angles from 0° to 90°.

Elastic shaft drive allows you to load or remove tubes while motor is running. This lightweight unit uses aluminum tube adaptors, sold separately, to hold various tubes diameter. The tube adaptors are easily removable, and can be used as carrying trays. Adaptors sold separately.

**Adjustable speed & angle of rotation**

- Variable speed and adjustable mixing angle, 0° to 90°
- Continuous or timed operation
- Durable construction for long-term operation
- 5 different disks and 3 roller drums:
  - Disks are also available for 250ml flask
  - Add up to 2 disks together for application
- LED display for actual speed.

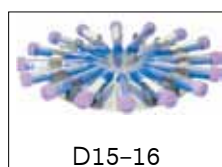
Model	TMO-1400
Angel range	0°~90°
Speed range	0~50 rpm
Timer	180min
Temp. Resist	Lower than 65°C (Dry air)
Weight	7.5kg
Dimensions(mm)	W220xD236xH246
Wattage	35W
Power	Free Voltage (AC100–240V)



D1.5-32



D1.5-60



D15-16



RD16-151



RD18-104



D50-8



RD25-42



D250-4

**Optional Disks:**

Model Number	Description
D50-8	Disk / 50ml conical tube-capacity:8ea
D15-16	Disk / 15ml conical tube-capacity:16ea
D1.5-32	Disk / 1.5ml centrifuge tube-capacity:32ea
D1.5-60	Disk / 1.5ml centrifuge tube-capacity:60ea
D250-4	Disk / 250ml Flask-capacity:4ea

**Roller Drums:**

Model Number	Description
RD16-151	Roller Drum/Up to 15mm Diameter tube-capacity: 151ea
RD18-104	Roller Drum/Up to 17mm Diameter tube-capacity: 104ea
RD25-42	Roller Drum/Up to 24mm Diameter tube-capacity: 42ea



PO-4

**Other Accessories:**

Model Number	Description
PO-4	Mount knobs for attaching one or 2 discs to the unit

## TMO-1500, Rotator



TMO-1500



### Use with a wide variety of accessories

- Variable speed and adjustable mixing angle, 0° to 90°
- Continuous or timed operation
- A wide choice of accessories to be used, including conical tubes, bottles and 250ml flask
- Optional rocking platform for washing
- LED display for actual speed.

Model	TMO-1500
Angel range	0°~90°
Speed range	0~50 rpm
Timer	99 hours 59 min
Temp. Resist	Lower than 65°C (Dry air)
Weight	8kg
Dimensions(mm)	W502xD236xH246
Wattage	35W
Power	Free Voltage (AC100~240V)

### Optional Disks:

Model Number	Description
D50-8	Disk / 50ml conical tube-capacity: 8ea
D15-16	Disk / 15ml conical tube-capacity: 16ea
D1.5-32	Disk / 1.5ml centrifuge tube-capacity: 32ea
D1.5-60	Disk / 1.5ml centrifuge tube-capacity: 60ea
D250-4	Disk / 250ml Flask-capacity: 4ea

### Accessories:



D1.5-32

D1.5-60

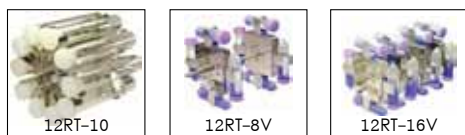
D15-16



RD16-151

RD18-104

RD25-42



12RT-10

12RT-8V

12RT-16V



12RT-200-96

12RT-200-128

12RT-300-120



Silicon cap bottle

12RK-TMO

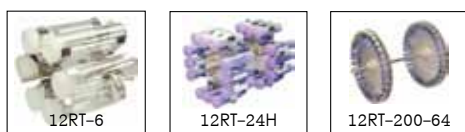
PO-4



D50-8

D250-4

12RT-4



12RT-6

12RT-24H

12RT-200-64



12RT-300-180

12RT-300-240

### Roller Drums:

Model Number	Description
RD16-151	Roller Drum/Up to 15mm Diameter tube-capacity: 151ea
RD18-104	Roller Drum/Up to 17mm Diameter tube-capacity: 104ea
RD25-42	Roller Drum/Up to 24mm Diameter tube-capacity: 42ea

### Other Accessories:

Model Number	Description
PO-4	Mount knobs for attaching one or 2 discs to the unit

### Roller Drum-TMO-1500 Only:

Model Number	Description
12RT-4	80mm Diameter X200mm length bottle capacity:4ea
12RT-6	60mm Diameter X200mm length bottle capacity:6ea
12RT-10	40mm Diameter X200mm length bottle capacity:10ea
	40mm Diameter X120mm length bottle capacity:20ea
12RT-8V	50ml Conical tube-capacity: 8ea - vertical mount
12RT-16V	50ml Conical tube-capacity: 16ea - vertical mount
12RT-24H	50ml Conical tube-capacity: 24ea - horizontal mount
12RT-200-64	1.5ml Centrifuge tube-capacity : 64ea
12RT-200-96	1.5ml Centrifuge tube-capacity : 96ea
12RT-200-128	1.5ml Centrifuge tube-capacity : 128ea
12RT-300-120	1.5ml Centrifuge tube-capacity : 120ea
12RT-300-180	1.5ml Centrifuge tube-capacity : 180ea
12RT-300-240	1.5ml Centrifuge tube-capacity : 240ea
12RK-TMO	Rocking platform(W285xD195xH65, tilt angle:±7°)



TRO-1200

**TRO-1200, Rocking Roller Mixer, 5 Rollers, Fixed Speed****Features:**

- Suitable for blending analysis samples such as blood samples.
- Plastic roller suitable for use with a variety of tubes.
- Gently rolling and tilting action.
- Easily load and unload without turning off the unit.
- Driving only with on/off switch and easy operation.
- Designed for continuous operation and fixed speed.

Model	Speed (rpm)	Number of roller	Roller size (mm)	Weight	Size (mm)
TRO-1200	40 (fixed)	5	Ø 30xL320	4.0kg	W455xD180xH95



TRO-1206

**TRO-1206, Rocking Roller Mixer, 6 Rollers, Variable Speed****Features:**

- Rocking and rolling motions for complete mixing
- Speed range of 0- 70rpm
- Six roller design with small footprint and easy clean
- DC brushless motor provides reliable and quiet running, maintenance free
- Designed for continuous operation
- Can be used in cold rooms or inside incubators.
- Voltage: 100-240
- Frequency: 50/60Hz
- Power: 25W
- Motor Type: DC
- Rocking & Rolling motion
- Amplitude: 24mm
- Max. load capacity: 4kg.

Model	Speed (rpm)	Number of roller	Roller size (mm)	Weight	Size (mm)
TRO-1206	0-70	6	280	4.5kg	W260xD450xH120

**TRO-1000, Test Tube Rocker**

For capped tubes up to 110mm long.

A white silicon rubber friction grip pad contrasts specimens and labels for easy viewing. Capped tubes can be easily loaded/unloaded without turning of the rocker.



TRO-1000

**Features:**

- Holds 10mm~30mm tube diameter sizes
- Ideal for blood collection tubes
- smooth mixing action provides uniform specimen suspension
- Precision-controlled rocking motion
- Continuous operation
- Easy to load and unload the test tubes without turning the mixer off
- Rubber cushion preventing the test tubes from slipping
- Quiet, smooth, and steady operation
- Constant speed 25/30rpm, 45° angle.

Model	Speed (fixed)	Capacity	Speed (rpm)	Platform size (mm)	Weight	Size (mm)
TRO-1000	30rpm at 60Hz 25rpm at 50Hz	16 Tubes	30rpm at 60Hz 25rpm at 50Hz	W300xD115	1.5/kg	W350xD140xH110



TRO-1300

**TRO-1300, Multi-Purpose Mixer**

MRC TRO-1300 Multi-Mix has the capability to perform three modes of mixing, all of which are programmable & can all be used in the same “run”. Or, if you just want to mix, set the unit to rotate. It is very simple to operate and program, runs can be programmed in seconds. You can mix many different sizes of tubes ranging from 1.5 ml to 50 ml with the 2 interchangeable mixing platforms that come standard with the unit. Tubes are held in-place with unique rubber flexible grippers; that surround and firmly hold tubes of varying diameters.

**Specifications:** Capacity: Platform 1: 22 Tubes: 1.5ml-15 (Installed when new) Platform 2: 6x50ml Tubes & 2x1.5-15ml Tubes (Included as an accessory) • RPM: Variable from 5 -30 RPM • Timer: Up to 999 Sec., max mixing time: 12 hours • Reciprocating Timer: Up to 999 Sec • Rotation Angle in Reciprocation Mode: 15°-90° (in 15° increments) • Turning angle vortex mode: 1 to 5 • Vortexing times: 1 to 5 • Maximum timer: 12 hours • Power: 110/220V • Dimensions: 13.5" x 7" x 7.5" • Weight: 6.7 Lbs. / 3 Kgs.

The TRO-1300 can mix in the following motions:

1. Rotate 360°, forward or reverse, & forward, then reverse.
2. Reciprocating Rocker, back & forth like a traditional rocker.
3. Vortex, (cavitate) Tube Capacity, 2 Platforms: Platform 1: 22 Tubes: 1.5ml-15ml (Installed) Platform 2: Six, 50ml Tubes & Two 1.5-15ml Tubes (Included).



CRO-1800

**CRO-1800, Cell Culture System Roller Mixer**

**Features:**

- Cell culture system roller mixer is equipped with high-quality rubber rollers, which are mounted in permanently lubricated sealed ball bearings, designed for lifetime operation.
- Cell culture system roller mixer allows large scale propagation of mono layer cultures in standard roller vessels.
- The fully enclosed belt-drive system also assures years of trouble-free service. Size: H182cm, W75cm, D56cm. Space between levels: 18.2cm. the levels can be changed.
- Wheels (rollers) are made of rubber, with two bearing fixed at both rollers end respectively. Wheels (rollers) are not coated. Material of frame is made of aluminium, but, the bottom cabinet is made of iron.
- The system would not be ignition, because, it runs under a low rpm, without brake.
- It is used with synchronous belts (chains), this belts should not be ignition under a low rpm running during operation.
- The system can be available for 104mm & 137mm diameter rolling bottles, 86mm diameter is too small.

Model	Speed (rpm)	Capacity	Speed display
CRO-1800	0.2~3.0	100pcs x 2000ml culture	Digital

Power supply: AC110V 60Hz, 220v 50/60Hz

**CROL-D4, CellNest Roller**



CROL-D4

The CellNest Roller has been optimized for laboratory-scale cell cultivation.

<b>Dimensions (HxWxD)</b>	340x385x360mm (2 Decks)
<b>Speed</b>	0--20RPH
<b>Power</b>	220v 50~60Hz
<b>Weight</b>	15kg (2Decks)



**Low noise, Low heat**  
Smooth running with low noise and good thermal isolation



**CO2-incubators**  
Compact body can be placed into most of the CO2-incubators



TMO-1700/1702

**TMO-1700/1702, Suspension Mixer**

**Applications:** Variable speed & adjustable angle rotation for optimum results in such applications as growth of tissues and viruses, hormone production from selected tissues, sample testing for the presence of viruses and cytotoxicity assays • Operates in standard incubators for cultivation under controlled temperature conditions up to 40°C and humidity conditions from 20 to 80% non-condensing • Powder coated stainless steel outer body construction for durability & corrosion resistance • Drum can be lifted off rotors easily.

**Common Applications:** Growth of mini preps • Bacterial culture • Viral culture • Tissue culture in test tubes



303-1-100022 - 40xØ29mm diam

303-1-100021 - 114xØ18mm diam

and centrifuge tubes.

**Features:** Suitable for mix of blood & culture samples • 360° rotating action • Gentle rotating motion mixes the contents of test tubes • Continuous operation • Equipped with a tachometer to indicate speed • Fully adjustable mixing angle from 0-90° • Choose from fixed or adjustable speed • Easy to load and unload the tubes.

Model	Angle Range	Speed Range (rpm)	Disc size (mm)	Weight	Dimensions (mm)	Power
TMO-1700	0-90°	10~100	Ø 310	12.0kg	W310xD310xH460	AC 110V/60Hz or 220V/50Hz
TMO-1702	0-90°	40~240				

**Roller Drums:**

Model Number	Description
303-1-100021	Drum, 114xØ18mm tube places (Optional)
303-1-100022	Drum, 40xØ29mm tube places (Optional)
303-1-100023	Drum, 48xØ18mm tube places & 20xØ29mm tube places (Included)



TRO-1100

**TRO-1100, Multi Tube Rotator****3D Rotation Permits Gentle, Low Foaming Agitation!**

**Accommodates fourteen 2,7,10 and 15ml tubes for mixing blood samples, DNA extractions and hybridizations.**

**Features:**

3D gyratory movement provides consistently uniform specimen quality in one minutes • Large capacity of tray holds a variety of sizes and shapes of containers such as tubes and vials • Rubber dimple mat of tray firmly but gently holds containers • Test tubes can be easily loaded and unloaded without turning the unit off • Ideal for use in hematology, blood chemistry and other laboratory applications where a

continuous, gentle motion is necessary • Mechanical action of unit provides a circular motion coupled with a rocking pattern which keeps liquids and solutions gently mixed without the potential for shearing or other damage • Angle of rotation varies to 20° from the horizontal plane • Shaker has a fixed speed of 30 rpm • Portable, lightweight metal body is durable & easy to clean • Compact size permits easy transportability & use in areas with limited space • Black silicon, non-skid, dimpled platform surface & sides hold 2,7,10 or 15 ml tubes firmly in place. No need for racks or clamps • Removable Black silicone platform, easy to clean & can be used to transport tubes.

Model	Speed(fixed)	Movement	Switch	Tray size(mm)	Size (mm)	Weight
TRO-1100	30rpm at 60Hz 25rpm at 50Hz	3D gyratory movement on a central point	On/Off	W230xD125	W230xD125xH175	1.8/kg



### About FM (Factory Mutual)

FM (Factory Mutual) was founded in 1897 and is the world's largest industrial and commercial life insurance company. Its customers cover 132 countries globally with a total of more than 10 million insurance programs. It provides a full range of insurance projects as well as engineering & technology-oriented risk management solutions. With one hundred years of rigorous scientific research and pioneering product testing technology, it is only natural that it attracts some of the world's largest and most successful technology giants. Therefore, it comes as no surprise that MRC clients expect nothing less than FM certified products to safeguard their livelihood.

### The significance of the FM Approval mark

FM provides testing and accreditation services to global industrial and commercial products through FM Approvals. FM Approvals is recognized as the top product testing and certification organization in the world, and is specified as the National Accreditation Laboratory (NRTL) in the United States Occupational Safety and Health Administration (OSHA). It is also recognized by the American National Standards Institute (ANSI) as a standard-setting body. FM Approvals' comprehensive accreditation services, expertise and partnerships ensure that all their approved products and services can be released in the global market quickly. Any product affixed with the FM Approval mark has endured and passed the highest testing standards in the United States and the world. It is a symbol of quality excellence, a guarantee over fire prevention, work safety and environmental protection.

### SafetyStar® World-Class Products for Fire Prevention

Any flammable item should be stored appropriately in a safety storage cabinet. All SafetyStar® Series cabinets are FM Approved and comply with NFPA and OSHA regulations.

### Chemical Storage Direction and Cabinet Colors



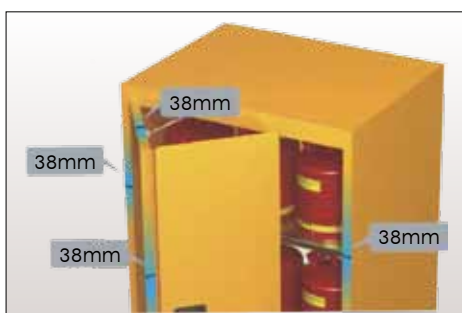
Yellow for flammable liquids



Red for combustible liquids



Blue for corrosive liquids



### Cabinet Construction

Double-wall cabinet construction with thickness of 1.2mm steel and 38mm air space efficiently isolates from combustion.

- Provides workers and environment optimum safety and quality assurance.
- Provides maximum property and asset protection.
- Prevents explosion, extension of a fire.

# S SAFETY CABINETS

Safety Comes from SafatyStar® Foresight Design and State of Art Technology



**Steel Piano Hinge**  
1.2mm steel continuous piano hinge provides smooth closure, reliable and durable use.



**Door Corners**  
Rounded corners avoid potential hand injury.



**Paddle Handle Latch**  
Eliminates projecting obstacles. Easy open & close.



**3-Point Lock**  
Non-sparking, 3-point linked latching device provides better security.



**Leak-Tight Sump**  
2 inch deep leak-tight containment sump for accidental drips & spills.



**Levelers**  
4 full steel adjustable levelers installed in base for stability.



**Dual Vents**  
Dual vents with flame arrester placed on both sides of the cabinets.



**Flame Arrester**



**For Fire Prevention, Work Safety, Environmental Protection. Reduces Your Industrial Safety Risks Once and for All.**

**Manual Closing**

- Economical and practical type.
- Three cabinet styles: single-door cabinets, double-door cabinets and sliding-door cabinets.
- Non-sparking, 3-point linked latching device provides superior security.

**Self-Closing**

- Three cabinet styles: single-door cabinets, double-door cabinets and sliding-door cabinets.
- Can stop at any position when opened between 90° ~ 180°. (sliding-door cabinets excluded)
- Built-in thermal-sensitive device releases and closes door automatically if the cabinet is exposed at 74°C.



Both manual & self-closing doors can be fully opened to 180°. Easy operation.



Steel adjustable shelves with 120kg loading capacity. Front & rear quick safety latch with closely integrated shelves & support frame reduces risks of collision.



Cabinet fire exposure test conducted by FM Approvals.

### Particular Purpose Storage Cabinets

Designed for various operating environments and different usage purpose. Enables flexibility & improves work efficiency.



**CCG004 Series**

**Countertop Cabinets**  
Built-in adjustable shelves for storing small items with the same design & functions as other cabinets.



**CCE045/CCH022 Series**

**Gas Cylinder Cabinets**  
Built-in casting aluminum alloy U-shaped holder & adjustable nylon straps. Ideal to fix all kinds of gas cylinders. Slip steel ramp plate facilitates the cylinders up & down.



**CCK055 Series**

**Horizontal Drum Cabinets**  
Can house 55 gallons drums horizontally. Optional removable steel drum support.

### Undercounter Cabinets

- Can be installed under work desks, laboratory tables & chemical fume hoods. Provides space-saving characteristics and offers convenient access to goods.

**CCI022 Series**



# S SAFETY CABINETS Flammable Liquids

## Single-Door Cabinets



Model	External Dimensions WxDxH mm(in.)	Internal Dimensions WxDxH mm(in.)	Capacity Gal.(L)	# of Shelves	Door Type
CCG004AAA	435 x 435 x 630 (17 x 17 x 25)	352 x 352 x 481 (14 x 14 x 19)	4(15)	1	Left hand / Self close
CCG012AAA	595 x 460 x 960 (23 x 18 x 38)	512 x 377 x 811 (20 x 15 x 32)	12(45)	1	Left hand / Self close
CCG015AAA	595 x 460 x 1190 (23 x 18 x 47)	512 x 377 x 1041 (20 x 15 x 41)	15(57)	1	Left hand / Self close
CCG004BAA	435 x 435 x 630 (17 x 17 x 25)	352 x 352 x 481 (14 x 14 x 19)	4(15)	1	Left hand / Self close
CCG012BAA	595 x 460 x 960 (23 x 18 x 38)	512 x 377 x 811 (20 x 15 x 32)	12(45)	1	Left hand / Self close
CCG015BAA	595 x 460 x 1190 (23 x 18 x 47)	512 x 377 x 1041 (20 x 15 x 41)	15(57)	1	Left hand / Self close
CCH022AAA	595 x 460 x 1720 (23 x 18 x 68)	512 x 378 x 1574 (20 x 15 x 62)	22(83)	3	Left hand / Self close
CCH054AAA	595 x 860 x 1720 (23 x 34 x 68)	512 x 778 x 1574 (20 x 31 x 62)	54(204)	3	Left hand / Self close
CCH022BAA	595 x 460 x 1720 (23 x 18 x 68)	512 x 378 x 1574 (20 x 15 x 62)	22(83)	3	Left hand / Self close
CCH054BAA	595 x 860 x 1720 (23 x 34 x 68)	512 x 778 x 1574 (20 x 31 x 62)	54(204)	3	Left hand / Self close
CCG004CAA	435 x 435 x 630 (17 x 17 x 25)	352 x 352 x 481 (14 x 14 x 19)	4(15)	1	Right hand / Self close
CCG012CAA	595 x 460 x 960 (23 x 18 x 38)	512 x 377 x 811 (20 x 15 x 32)	12(45)	1	Right hand / Self close
CCG015CAA	595 x 460 x 1190 (23 x 18 x 47)	512 x 377 x 1041 (20 x 15 x 41)	15(57)	1	Right hand / Self close
CCG004DAA	435 x 435 x 630 (17 x 17 x 25)	352 x 352 x 481 (14 x 14 x 19)	4(15)	1	Right hand / Self close
CCG012DAA	595 x 460 x 960 (23 x 18 x 38)	512 x 377 x 811 (20 x 15 x 32)	12(45)	1	Right hand / Self close
CCG015DAA	595 x 460 x 1190 (23 x 18 x 47)	512 x 377 x 1041 (20 x 15 x 41)	15(57)	1	Right hand / Self close
CCH022CAA	595 x 460 x 1720 (23 x 18 x 68)	512 x 378 x 1574 (20 x 15 x 62)	22(83)	3	Right hand / Self close
CCH054CA	595 x 860 x 1720 (23 x 34 x 68)	512 x 778 x 1574 (20 x 31 x 62)	54(204)	3	Right hand / Self close
CCH022DAA	595 x 460 x 1720 (23 x 18 x 68)	512 x 378 x 1574 (20 x 15 x 62)	22(83)	3	Right hand / Self close
CCH054DAA	595 x 860 x 1720 (23 x 34 x 68)	512 x 778 x 1574 (20 x 31 x 62)	54(204)	3	Right hand / Self close

**Double-Door Cabinets**



Model	External Dimensions WxDxH mm(in.)	Internal Dimensions WxDxH mm(in.)	Capacity Gal.(L)	# of Shelves	Door Type
<b>CCE030AAA</b>	1090 x 460 x 1190 (43 x 18 x 47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Self close
<b>CCE045AAA</b>	1007 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Self close
<b>CCE060AAA</b>	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Self close
<b>CCE090AAA</b>	1090 x 860 x 1720 (34 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Self close
<b>CCE030BAA</b>	1090 x 460 x 1190 (43 x 18 x 47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Manual
<b>CCE045BAA</b>	1090 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Manual
<b>CCE060BAA</b>	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Manual
<b>CCE090BAA</b>	1090 x 860 x 1720 (43 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Manual
<b>CCI022AAA</b>	1415 x 520 x 740 (56 x 20 x 29)	1332 x 434 x 591 (52 x 17 x 23)	22(83)	1	Self close
<b>CCI022ABA</b>	1415 x 520 x 570 (56 x 20 x 22)	1332 x 434 x 421 (52 x 17 x 17)	22(83)	1	Self close
<b>CCI022ACA</b>	1115 x 520 x 740 (44 x 20 x 29)	1032 x 434 x 591 (41 x 17 x 23)	22(83)	1	Self close
<b>CCI022ADA</b>	1115 x 520 x 570 (44 x 20 x 22)	1032 x 434 x 421 (41 x 17 x 17)	22(83)	1	Self close
<b>CCI022BAA</b>	1415 x 520 x 740 (56 x 20 x 29)	1332 x 434 x 591 (52 x 17 x 23)	22(83)	1	Manual
<b>CCI022BBA</b>	1415 x 520 x 570 (56 x 20 x 22)	1332 x 434 x 421 (52 x 17 x 17)	22(83)	1	Manual
<b>CCI022BCA</b>	1115 x 520 x 740 (44 x 20 x 29)	1032 x 434 x 591 (41 x 17 x 23)	22(83)	1	Manual
<b>CCI022BDA</b>	1115 x 520 x 570 (44 x 20 x 22)	1032 x 434 x 421 (41 x 17 x 17)	22(83)	1	Manual
<b>CCK055AAA</b>	760 x 1220 x 1220 (30 x 48 x 48)	677 x 1137 x 1193 (27 x 45 x 47)	1-55(208)	none	Self close
<b>CCK055BAA</b>	760 x 1220 x 1220 (30 x 48 x 48)	677 x 1137 x 1193 (27 x 45 x 47)	1-55(208)	none	Manual
<b>CCL055AAA</b>	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	1-55(208)	1	Self close
<b>CCL055BAA</b>	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	1-55(208)	1	Manual

# S SAFETY CABINETS

## Sliding-Door Cabinets



Model	External Dimensions WxDxH mm(in.)	Internal Dimensions WxDxH mm(in.)	Capacity Gal.(L)	# of Shelves	Door Type
CCF030AAA	1090 x 460 x 1190 (43 x 18 x 47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Left hand / Self close
CCF045AAA	1090 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Left hand / Self close
CCF060AAA	860 x 860 x 172 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Left hand / Self close
CCF090AAA	1090 x 860 x 1720 (43 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Left hand / Self close
CCF030BAA	1090 x 460 x 1190 (43 x 18*47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Left hand / Manual
CCF045BAA	1090 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Left hand / Manual
CCF060BAA	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Left hand / Manual
CCF090BAA	1090 x 860 x 1720 (43 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Left hand / Manual
CCF030CAA	1090 x 460 x 1190 (43 x 18 x 47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Right hand / Self close
CCF045CAA	1090 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Right hand / Self close
CCF060CAA	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Right hand / Self close
CCF090CAA	1090 x 860 x 1720 (43 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Right hand / Self close
CCF030DAA	1090 x 460 x 1190 (43 x 18 x 47)	1007 x 375 x 1041 (40 x 15 x 41)	30(114)	1	Right hand / Manual
CCF045DAA	1090 x 460 x 1720 (43 x 18 x 68)	1007 x 375 x 1574 (40 x 15 x 62)	45(170)	2	Right hand / Manual
CCF060DAA	860 x 860 x 1720 (34 x 34 x 68)	778 x 778 x 1574 (31 x 31 x 62)	60(227)	2	Right hand / Manual
CCF090DAA	1090 x 860 x 1720 (43 x 34 x 68)	1007 x 778 x 1574 (40 x 31 x 62)	90(340)	2	Right hand / Manual

## Low Corrosive Liquid Storage Cabinets



In addition to flammable liquids, there are also a lot of corrosive chemical stored in the laboratories and industrial plants. safetystar® blue low-corrosive liquid storage cabinet is your best choice. double-wall 1.2mm steel plate structure, coated with a unique anti-corrosive baking paint for storage of low corrosive acid/alkali liquid includes low concentrations of chemical such as hydrochloric acid, sulfuric acid, nitric acid, ammonia and sodium hypochlorite.

- All SafetyStar® Series low corrosive liquid cabinets listed are FM Approved & comply with NFPA and OSHA regulations.
- Provides exactly the same functions and design characteristics as the flammable liquid storage cabinets.
- Double-wall cabinet construction with thickness of 1.2mm steel & 38mm air space efficiently isolates from combustion
- Non-sparking, 3-point linked latching device provides superior security.
- Dual vents with flame arrester placed on both sides of cabinets.
- Adjustable steel shelves for 120kg loading. Front and rear quick safety latch with closely integrated shelves & support frame reduces risks of collision.
- Optional high-strength anti-corrosive PP/PE material trays can be placed on the shelves and the sump for double anti-corrosion option.
- 2 inch deep leak-tight containment sump for accidental drips and spills.



\* For detailed product specifications, please refer to the flammable liquid storage cabinet section. The first 8 "ordering model" digits are the same as the flammable liquid storage cabinet + the end digit "B".

## Combustible Liquid Storage Cabinets



All safetystar® Series combustible liquid cabinets listed are fm approved and comply with nfpa and osha regulations.

- Same functions and design characteristics as the flammable liquid storage cabinets.
- Suitable for storing paints, inks and mineral oil.
- Double-wall cabinet construction with thickness of 1.2mm steel & 38mm air space efficiently isolates from combustion.
- Non-sparking, 3-point linked latching device provides superior security.
- Dual vents with flame arrester placed on both sides of the cabinets.
- Adjustable steel shelf can hold 120kg load.



\* For detailed product specifications, please refer to the flammable liquid storage cabinet section. The first 8 "ordering model" digits are the same as the flammable liquid storage cabinet + the end digit "C".

## Explosion-Proof Waste Chemical Storage Cabinets

This cabinet is used to store waste chemical and recyclable solvent. It can exhaust the gas outdoors to avoid waste solvent gas emitting into the work area.

- Chemical corrosion-resistance board.
- Walk-in hood.
- Hanging rail explosion-proof window.
- Explosion-proof grade control system.
- Modular structure, quick assembly and disconnect.

Model	Dimensions WxDxH mm
HAQ-180	1800 x 860 x 2225
HAQ-210	2100 x 860 x 2225



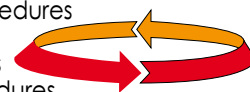


**BenchTop Platform Shakers:**



**Applications:**

- Cell cultures
- Bacterial suspensions
- Solubility studies
- Staining
- Extraction procedures
- Destaining
- Diagnostic tests
- Washing Procedures
- General Mixing
- Hybridization



**Features:**

- Triple eccentric drive enables continuous 24-hours operation, handles heavier loads and provides smooth uniform agitation of full or unbalanced loads even at high speeds.
- Units operate in temperature range of 4 to 40°C and humidity conditions from 20 to 80% non condensing enabling them to be used in incubators, warm rooms, environmental chambers and refrigerators.
- Easy to adjust speed up to 300rpm.
- Easy to adjust timer up to 9999 minutes.
- Memory of speed when power cut.

MRC orbital shakers are for shaking in ambient conditions on the bench or in incubator or warm room or cool room. These shakers are available in three models. Model TOS-4030PD - flat platform shaker, model TOS-4030TD universal platform shaker and model TOS-4030FD flask clamps platform shaker. Platform can be easily removed and replaced by opening the four screws on the center of the platform. Model TOS-4030FD platform can accommodate a mix of flask clamps. A powerful, quiet, space saving, reliable, either for gentle shaking of liquids or vigorous mixing of materials. Maintenance free, the coated tray is proof against aggressive liquids. Flexible platform system. All kinds of dishes can be placed on the platforms: beakers, erlenmeyer flask, test tube racks etc. All models feature a large easy to read LED display. A specific run time can be entered or continuous running can be selected. These medium size orbital shakers are well engineered & provide smooth operation when under maximum load and speed.

The top tray of each model has threaded holes to accommodate flask holders from 50ml to 6000ml.



**Optional: Universal spring tray for TOS-4030FD**



**Optional: Frame Holder**



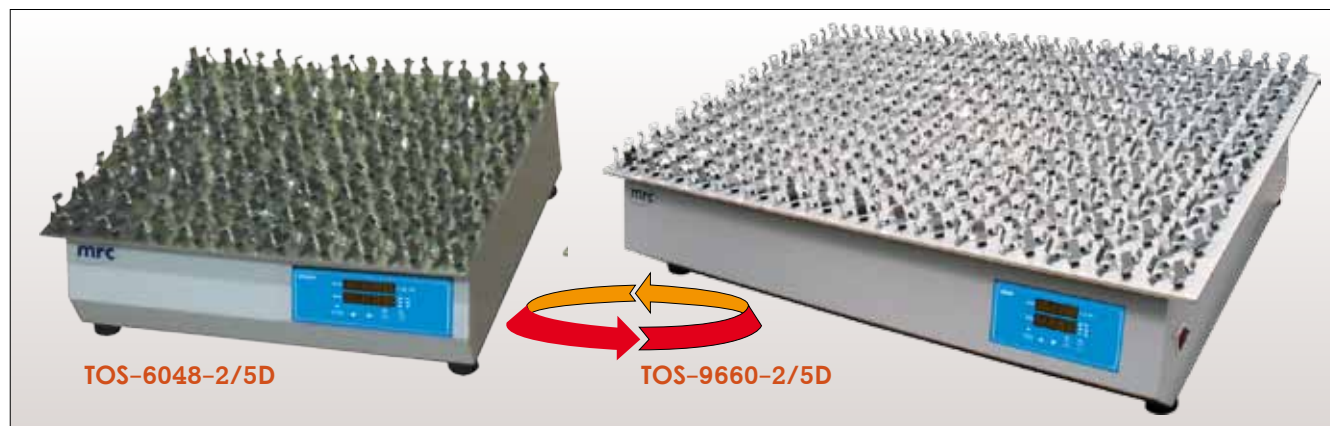
**TOS-4030PD**

Model	TOS-4030PD	TOS-4030FD	TOS-4838FD	TOS-6048FD
System shaking	Orbital			
Rate of shaking	20-300 rpm			
Shaking width	25m			
Shaking plate (mm)	W400xD300		W480xD380	W600xD480
Outside DIM. (mm)	W400xD330xH165		W480xD380xH165	W600xD480xH210
Shaking plate	Plate	Flask rack	Flask rack	
Power supply	110/220V, 60/50Hz (1A)			
Weight	11kg	12kg	18kg	25kg

**Accessories:**

Model	111-1-110050	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000	111-1-116000
Model/flask clamps	50ml	125ml	250ml	500ml	1000ml	2Liter	3Liter	4Liter	5Liter	6Liter
TOS-4030F Capacity	35	20	12	6	4	2	1	1	-	-
TOS-4838F Capacity	48	30	20	12	6	4	2	2	1	1
TOS-6048F Capacity	80	48	30	20	12	6	6	4	2	2

## Heavy Duty Platform Shakers



MRC large open air shakers designed to uniformly shake hundreds of samples, day-in & day-out, under the extreme conditions of an environmental room. New engineering concepts in load balancing minimize stress & vibrations, even when fully loaded & running at the maximum speed. Accepts hundreds of samples on up to 2 accessory platforms. As pictured, platforms have easy access to all glassware, & lock in place without tools. Maintenance free, the coated tray is proof against aggressive liquids. A powerful, quiet, reliable, either for gentle shaking of liquids or vigorous mixing of materials. Optional: Digital speed control.

**Unique Advantage:**

Precisely balanced, extremely stable shaker mechanism with massive cast-iron base need not be bolted to the floor. Four large capacity Orbital Shakers available. Both are well engineered and have heavy duty orbital

mechanisms that provide smooth operation when under maximum loading and speed. The top plate is 6mm aluminium and has tapped holes to accommodate flask holders from 50ml up to the heavy flask sizes: 1 Liter to 6 Liter. Both models can carry a maximum load of 40kg. Both models feature an easy to use digital control with speed and timer display and are attractively finished in a durable grey powder coating. A specific run time can be entered or continuous running can be selected.



FLASK HOLDERS

**Optional: Tube Holders**

Model	TOS-6048-2D	TOS-6048-5D	TOS-9660-2D	TOS-9660-5D
<b>Shaking system</b>	Orbital			
<b>Rate of shaking</b>	30-400 rpm	20-250 rpm	30-400 rpm	20-250 rpm
<b>Shaking width</b>	25 mm	50 mm	25 mm	50 mm
<b>Shaking plate</b>	W600xD480		W960xD600	
<b>Outside dimensions (mm)</b>	W600xD480xH210		W960xD600xH210	
<b>Weight</b>	63 kg		75 kg	

**Accessories:**

Model	111-1-110050	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000	111-1-113000	111-1-114000	111-1-115000	111-1-116000
<b>Flask clamps</b>	50ml	125ml	250ml	500ml	1000ml	2Liter	3Liter	4Liter	5Liter	6Liter
<b>TOS-6048-2/5 Capacity</b>	80	48	30	20	12	6	6	4	2	2
<b>TOS-9660-2/5 Capacity</b>	160	96	60	40	24	15	8	8	6	6



DOR-2828

DOR-2828D

- Wide used in VDRL, PRP, and EIA test.
- Stable and quiet Operation.
- Simple and digital type for your options.
- With variable speed, timer control, and continuous operation.
- Quality certification: ISO 9001, ISO 13485.

**DOR-Series, Small Orbital Shakers**

Model	DOR-2828	DOR-2828D
<b>Speed</b>	40~240 rpm	
<b>Timer</b>	0~30 min. mechanical timer	99 hours & 59 minutes digital timer
<b>Display</b>	No display	Digital display for present speed value & remaining time
<b>Platform size (mm)</b>	W280xD280	
<b>Orbit diameter</b>	20 mm	
<b>Load capacity</b>	2.0kgs at the speed from 20-150rpm; 1.0kgs at the speed from 151-240rpm	
<b>Standard accessory</b>	1 pc of spring	
<b>Size (mm)</b>	W280xD295xH140	W280xD295xH140
<b>Weight (N.W/G.W)</b>	4.0/4.8kg	4.2/5.0kg

## Double Platform Large Orbital Shakers



MRC large open air shakers designed to uniformly shake hundreds of samples, day-in & day-out, under the extreme conditions of an environmental room. New engineering concepts in load balancing minimize stress & vibrations, even when fully loaded & running at the maximum speed. Accepts hundreds of samples on up to 2 accessory platforms. As pictured, platforms have easy access to all glassware, & lock in place without tools. Maintenance free, the coated tray is proof against aggressive liquids. A powerful, quiet, reliable, either for gentle shaking of liquids or vigorous mixing of materials. Optional: Digital speed control.

**Unique Advantage** - Precisely balanced, extremely stable shaker mechanism with massive cast-iron base need not be bolted to the floor. Four large capacity Orbital Shakers available. Both are well engineered and have heavy duty orbital mechanisms that provide smooth operation when under maximum loading and speed. The top plate is 6mm aluminium and has tapped holes to accommodate flask holders from 50ml up to the

heavy flask sizes: 1 Liter to 6 Liter. Both models feature an easy to use digital control with speed and timer display and are attractively finished in a durable grey powder coating. A specific run time can be entered or continuous running can be selected.

Reliable, day after day operation, user friendly operation, 960x480mm double platform.



This space saving two stage shakers enable to shake 2 platform simultaneously. 600 x 480mm double platform.



Model	TOS-6048D-2D	TOS-6048D-5D	TOS-9660D-2D	TOS-9660D-5D
Shaking system	Orbital			
Rate of shaking	30-400 rpm	20-250 rpm	30-400 rpm	20-250 rpm
Shaking width	25 mm	50 mm	25 mm	50 mm
Shaking plate	W600xD480 Double		W960xD600 Double	
Outside dimensions (mm)	W600xD480xH560		W960xD600xH560	
Weight	75 kg		95 kg	

### Accessories:

Model	111-1-110050	111-1-110125	111-1-110250	111-1-110500	111-1-111000	111-1-112000
Flask clamps	50ml	125ml	250ml	500ml	1000ml	2Liter
TOS-6048D-2/5 Capacity	160	96	60	40	25	15
TOS-9660D-2/5 Capacity	320	192	120	80	48	30

## SI-1501, SI-1601, SI-1701, Orbital Shaker



SI-1501

SI-1601

SI-1701

- Choice of THREE different units depending on preferred platform.
- Variable shaking speed with orbit REVERSING.
- Fully programmable - time, reversing time, and acceleration/deceleration rates.
- Create any mixing action from a smooth vortex to sloshing aeration (or anything in between).
- Equipped with stepper motor, delivering exceptional speed control, accuracy, and durability.
- Timer displays time or, when programmed to a defined limit, will shut off the unit.
- May be used in cold room or incubator and CO<sub>2</sub> environments.

## Platform Options:



Orbital-Genie With Universal Ratcheting Clamps provides the flexibility for using a mix of different size and shape vessels on a single platform. Unit is supplied with two ratcheting and one non ratcheting cushioned clamps. Extra ratcheting clamps for more than two rows of smaller vessels are optional.



Orbital-Genie With Adhering Mat provides a flat platform with adhering rubber mat perfect for use with open containers. Patented material is naturally adhering. Rinse clean to renew adhering properties.



Orbital-Genie For Standard Flask Clamps is equipped with a platform for accepting various size flasks or beakers. Clamps sold separately.



**Accessories: Flask Clamps** (for SI-1601) are of stainless steel construction for added strength and safety. Mix & match different size clamps on same platform or all same size (capacity is indicated). Includes mounting screws. Note: Flask Clamps can also be used on SI-1701 by removing the blue Adhering Mat.







**Double Sided Adhesive Tape & Adhering Mat** (for SI-1601 or SI-1701) are alternatives to flask clamps for securing vessels to shaker platform. Both are ideal for containers such as bottles and dishes that cannot be held with conventional clamps. Note: Tape and Mat cannot be used on SI-1501.

Model	SI-1501	SI-1601	SI-1701
Speed	10-300 RPM including Stir Reverse		
Timer	1 min - 99 hours w/Alarm or Continuous		
Orbit	35mm dia.		
Selectable Ramp Rates	10 - 100 RPM/sec		
Platform Dimensions (DxW)	460x460 mm		
Overall Dimensions (DxW)	590x500mm		

**KOS/KCS-3333, KOS/KCS-3016, Orbital & Linear Shakers**





Orbital and Linear Digital Shakers provide smooth and quiet motions for mixing in culture dishes, flasks and beakers.

- Compact, orbital and Linear shakers with ideal shaking motion, for a maximum shaking weight of 7.5kg and 2.5kg
- LCD displays speed and timer. Speed, timer & operating mode can be viewed simultaneously
- Wide range of platforms for use with a variety of vessels
- Electronic time switching clock controls time or continuous operation mode
- DC brushless motor, long service life & maintenance free
- Over speed detection and protection
- Free software Shaker PC, computer can control and document all operation values via RS232 interface.

Model	KOS-3016/KCS-3016		KOS-3333/KCS-3333	
Power (W)	30			
Shaking motion	Orbital 	Linear 	Orbital 	Linear 
Orbital diameter (mm)	20		10	
Max. load capacity (with platform) (kg)	3		7.5	
Motor type	DC motor		DC brushless motor	
Motor rating input (W)	16		28	
Motor rating output (W)	10		15	
Speed range (rpm)	0-200		100-500(Orbital) / 100-350(Linear)	
Speed display			LCD 	
Timer	-		Yes	
Timer display	-		LCD	
Time setting range (min)	-		1-1199	
Operation type	Continuous		Continuous / timed operation	
Dimensions (W x H x D mm)	330 x 270 x 110		340 x 300 x 100	
Weight (kg)	3.1		8.1	
Permissible ambient temperature (C), humidity	5-40, 80%			
Protection class acc. DIN EN60529	IP21			
RS232 interface	-		Yes	

**KRS-3016/KRS-3333, Rocker Shakers**

- Smooth see-saw rocking motion with fixed angle 9°
- Load up to 10kg
- Speed range of 10-70rpm
- DC brushless motor provides reliable and quiet running. maintenance free
- Designed for continuous or timed operation
- Digital speed control and LCD display, speed and timer can be viewed simultaneously
- Wide range of accessory platform to be used for variable size vessels. and non-slip mat holds vessels prevent slipping.

Model	KRS-3016	KRS-3333
Power (W)	20	40
Motor type	DC motor	
Rocking Motion		
Tilt angle(°)	±7	±9
Max. load capacity (with platform) (kg)	3	10
Speed range (rpm)	0-80	10-70
Speed display		LCD 
Timer	-	Yes
Timer display	-	LCD
Time setting range (min)	-	1-1199
Operation type	Continuous	Continuous / timed operation
Dimensions (W x H x D mm)	330 x 270 x 130	410 x 360 x 200
Weight (kg)	3.2	9
Permissible ambient temperature (C), humidity	5-40, 80%	
Protection class acc. DIN EN60529	IP21	
RS232 interface	-	Yes



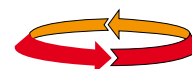
TOS-3030/SOH-3030



TOS-3030D (Tachometer)

**TOS-3030/TOS-3030D, Orbital Shaker**

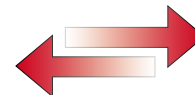
- Smooth and powerful orbital motion at a low speed
- Continuous or timed operation
- Optional second platform available to double the working area; large upper platform for a variety of flasks and tubes
- Other type flask platform also available upon special request
- Standard elastic ties for easy fitting of flasks and conical tubes
- Non-slip mat as standard; optional dimpled mat prevents tubes from rolling around
- Can select economical model or the version with LED display of rpm.



Model	TOS-3030	TOS-3030D
<b>Reciprocating range</b>	14mm	
<b>Speed range</b>	0 ~ 300 rpm	
<b>Motor</b>	DC 3.5A	
<b>Timer</b>	180 min	
<b>Temp. resist</b>	Lower than 65°C (Dry air)	Lower than 55°C (Dry air)
<b>Loadable Weight</b>	8kg	
<b>Weight</b>	15kg	
<b>Dimensions (mm)</b>	Overall: W300xD300xH158 Platform: W300xD300	
<b>Wattage</b>	35W	
<b>Power</b>	Free Voltage (AC100-240V)	

**Accessories:****SOH-3030/ SOH-3030D, Reciprocating Shaker**

- Smooth and powerful orbital motion at a low speed
- Continuous or timed operation
- Optional second platform available to double the working area; large upper platform for a variety of flasks and tubes
- Standard elastic ties for easy fitting of flasks and conical tubes
- Non-slip mat as standard; optional dimpled mat prevents tubes from rolling around
- Can select economical model or the version with LED display of rpm.



Model	SOH-3030	SOH-3030D
<b>Reciprocating range</b>	30mm	
<b>Speed range</b>	0 ~ 300 rpm	
<b>Motor</b>	DC 3.5A	
<b>Timer</b>	180 min	
<b>Temp. resist</b>	Lower than 65°C (Dry air)	Lower than 55°C (Dry air)
<b>Loadable Weight</b>	8kg	
<b>Weight</b>	15kg	
<b>Dimensions (mm)</b>	Overall: W300xD300xH162 Platform: W300xD300	
<b>Wattage</b>	35W	
<b>Power</b>	Free Voltage (AC100-240V)	

**Accessories:**

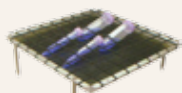
Model Number	Description
<b>DP-300</b>	Dimpled mat (W300 X D300 mm)
<b>TY300</b>	Second platform, (with posts: 4ea)
<b>UP400</b>	400 X 400 mm upper platform
<b>UP500</b>	500 X 500 mm upper platform

**Other Accessories:**

Model	Description
<b>CP50</b>	50ml flask holder
<b>CP100</b>	100ml flask holder
<b>CP250</b>	250ml flask holder
<b>CP500</b>	500ml flask holder
<b>FT302-50-13</b>	Flask Rack for 50ml flask-Capacity: 13ea
<b>FT302-100-13</b>	Flask Rack for 100ml flask-Capacity: 13ea
<b>FT302-250-8</b>	Flask Rack for 250ml flask-Capacity: 8ea
<b>FT302-500-5</b>	Flask Rack for 500ml flask-Capacity: 5ea
<b>FT302</b>	Universal plate for flask holder
<b>FT302-MP4</b>	Rack for micro well plate - Capacity: 4ea



DP-300

TY300  
(Second platform)CP50  
50ml HolderUP400/UP500  
(upper platform  
400x400mm/  
500x500mm)CP500  
500ml Holder

FT302-50-13



FT302-100-13

CP100  
100ml Holder

FT302-250-8



FT302-500-5

CP250  
250ml Holder

FT302 Plate



FT302-MP4

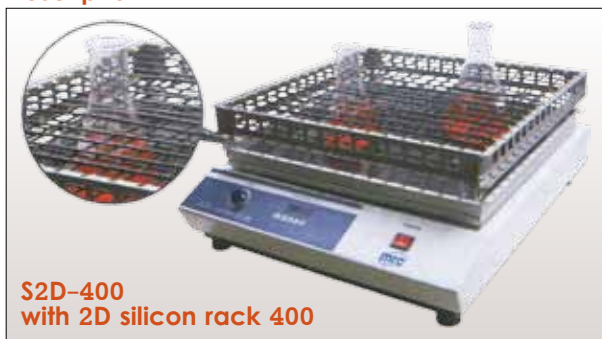
### S2D-300/S2D-400, Change between orbital or reciprocating motion



- Smooth and powerful orbital or reciprocating motion at a low speed
- Optional platform available for flasks
- LED display (shown actual speed or time)
- High quality permanent DC brush less motor for gentle and powerful motion
- Continuous or timed operation.

Model	S2D-300	S2D-400
<b>Shaking Range</b>	14mm	28mm
<b>Speed Range</b>	45-400rpm	
<b>Motor</b>	BLDC motor	
<b>Timer</b>	99hours 59min	
<b>Temp. Resist</b>	Lower than 55°C	
<b>Loadable weight</b>	4kgs	6kgs
<b>Weight</b>	13kgs	17kgs
<b>Dim (mm)</b>	320x410x140	430x520x140
<b>Platform(mm)</b>	300x300	400x400
<b>Wattage</b>	30W	
<b>Power</b>	Free Voltage (AC100-240V)	

### Description:



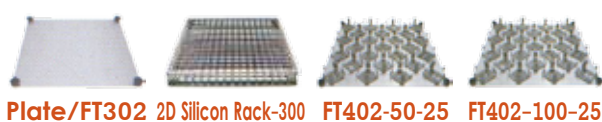
### Accessories Flask holder for S2D-300/S2D-400:

Model number	Description
<b>CP50</b>	50ml flask holder
<b>CP100</b>	100ml flask holder
<b>CP250</b>	250ml flask holder
<b>CP500</b>	500ml flask holder

### Accessories Flask holder for S2D-300:

Model number	Description
<b>FT302-50-13</b>	Flask rack for 50ml flask-capacity: 13ea
<b>FT302-100-13</b>	Flask rack for 100ml flask-capacity: 13ea
<b>FT302-250-8</b>	Flask rack for 250ml flask-capacity: 8ea
<b>FT302-500-5</b>	Flask rack for 500ml flask-capacity: 5ea
<b>FT302</b>	Universal plate for flask holder (300x300mm)
<b>2D Silicon RACK-300</b>	Silicon Rack for Shaker S2D-300

### Accessories:



### Accessories Flask holder for S2D-400:

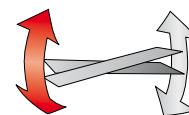
Model number	Description
<b>FT402-50-25</b>	Flask rack for 50ml flask-capacity: 25ea
<b>FT402-100-25</b>	Flask rack for 100ml flask-capacity: 25ea
<b>FT402-250-14</b>	Flask rack for 250ml flask-capacity: 14ea
<b>FT402-500-9</b>	Flask rack for 500ml flask-capacity: 9ea
<b>FT402</b>	Universal plate for flask holder (400x400mm)
<b>2D Silicon RACK-400</b>	Silicon Rack for Shaker S2D-400



COR-2129

**COR-2129, Compact rocker in timed and continuous operation**

- Variable speed control between 0 & 70 rpm
- Continuous or timed operation
- Sturdy & durable construction for use at high & low temp
- Optional second platform available to double the working area
- Non-slip mat as standard ; optional dimpled mat prevents tubes from rolling around
- All moving parts of the rocking platform are combined with ball joints for smooth operation and years of consistent operation.

**Accessories:**

DP-100

TY100  
(Second platform)

Model	COR-2129
<b>Tilt angle</b>	±9°
<b>Speed range</b>	Variable 0 ~ 70 rpm
<b>Motor</b>	DC 3.5A, Engineering Plastic gear
<b>Timer</b>	180 min
<b>Temp. resist</b>	Lower than 65°C
<b>Loadable Weight</b>	7kg
<b>Weight</b>	6.5kg
<b>Dimensions (mm)</b>	Overall: W290xD210xH167 Platform: W290xD200
<b>Wattage</b>	35W
<b>Power</b>	AC110/220/230V, 50/60Hz

**Accessories:**

Model	Description
<b>DP-100</b>	Dimpled mat (W290 X D200 mm)
<b>TY100</b>	Second platform, (with posts: 4ea)



MOW-3333

**MOW-3333, Waver Shaker**

Waver shaker offers the optimal movement for the multiple staining and washing involved in gel, blotting, microscopy & immunostaining applications. Its combination of vertical & horizontal orbital motion provides more rapid exchange of solvents and better mixing efficiency.

**Features:**

- Continuous or timed operation with automatic switch-off
- Variable shaking speed from 5 to 100rpm for mixing & wash action
- 2 shaking moves in 2D or 3D
- Adjustable platform angle
- Interchangeable/ stacking platforms, & accessories for a variety of vessels
- 15kg carry capability
- One of 4 digital red LED display
- High quality DC Brushless motor
- Easy to extension shelf
- Light weight for easy mobility
- Very easy maintenance
- 330x330mm platform.

Model	MOW-3333
<b>Motion</b>	Orbital and Nutation (2D or 3D)
<b>Controller</b>	Digital microprocessor controller
<b>Speed/inc</b>	5~100 rpm/1 rpm
<b>Timer</b>	1~9999 mins with alarm, continuous/1 min
<b>Carry capability</b>	15 kg
<b>Motor</b>	DC Brushless type
<b>Operation temp.</b>	Ambient to 40°C
<b>Platform DIM.(mm)</b>	W330xL330
<b>Platform material</b>	Painted iron metal
<b>Unit dimension (mm)</b>	W330xL450xH280
<b>Construction</b>	Painted iron metal
<b>Weight</b>	approx. 10kg
<b>Rated voltage</b>	110V/220V selectable



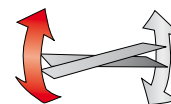


COR-3030



COR-3030D (with tachometer)

**COR-3030/COR-3030D, Large capacity platforms and smooth rocking motion**

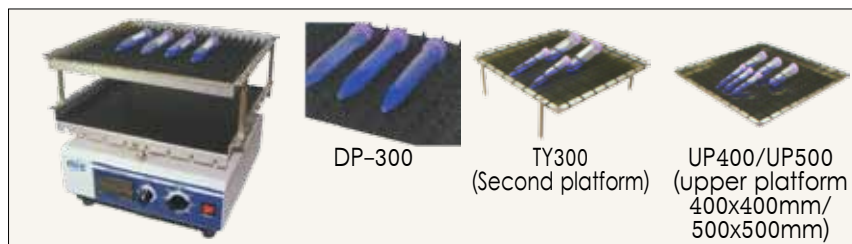


- Variable speed control between 0 and 70 rpm
- Continuous or timed operation
- Sturdy and durable construction for use at high and low temperature
- Optional second platform available to double the working area: large upper platform for a variety of flasks and tubes
- Non-slip mat as standard; optional dimpled mat prevents tubes from rolling around
- All moving parts of the rocking platforms are combined with ball joints for smooth operation and years of consistent operation
- Can select economical model or the version with LED display of rpm.

Model	COR-3030	COR-3030D
<b>Tilt angle</b>	±9°	
<b>Speed range</b>	0 ~ 70rpm	
<b>Motor</b>	DC 3.5A, Engineering Plastic gear	
<b>Timer</b>	180min	
<b>Temp. resist</b>	Lower than 65°C (dry air)	Lower than 55°C (dry air)
<b>Loadable Weight</b>	10 kg	
<b>Weight</b>	8.2 kg	
<b>Dimensions (mm)</b>	Overall: W300xD300xH232 Platform: W300xD300	
<b>Wattage</b>	35W	
<b>Power</b>	Free Voltage (AC100-240V)	

**Accessories:**

Model Number	Description
DP-300	Dimpled mat (W300 X D300 mm)
TY300	Second platform, (with posts: 4ea)
UP400	400 X 400 mm upper platform
UP500	500 X 500 mm upper platform



TOW-3030



TOW-3030D (with Tachometer)

**TOW-3030/TOW-3030D, 3D Motion Twist Shakers**

**Powerful but, reliable 3D orbital motion**

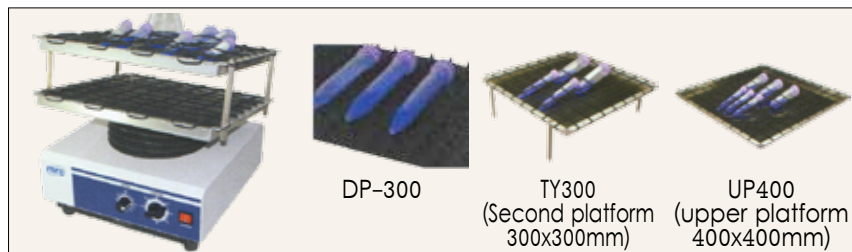


- Gentle 3D motion & sturdy construction for high capacity.
- Continuous or timed operation.
- Standard elastic ties for easy fitting of flasks and conical tubes.
- Optional second platform available to double the working area; large upper platform for a variety of flasks and tubes. Non-slip mat as standard; optional dimpled mat prevents tubes from rolling around.
- Rubber bellows for maximum user safety to protect the user from accidentally jamming user's fingers.
- Can select economical model or the version with LED display of rpm.

Model	TOW-3030	TOW-3030D(Tachometer)
<b>Tilt angle</b>	±7°	
<b>Speed range</b>	0 ~ 70 rpm	
<b>Motor</b>	DC 3.5A, Engineering Plastic gear	
<b>Timer</b>	180 min	
<b>Temp. resist</b>	Lower than 65°C(Dry air)	Lower than 55°C (Dry air)
<b>Loadable Weight</b>	5kg	
<b>Weight</b>	9kg	
<b>Dimensions (mm)</b>	Overall: W300xD300xH232 Platform: W300xD300	
<b>Wattage</b>	35W	
<b>Power</b>	Free Voltage (AC100-240V)	

**Accessories:**

Model Number	Description
DP-300	Dimpled mat (W300 X D300 mm)
TY300	Second platform, (with posts: 4ea)
UP400	400 X 400 mm upper platform





### FMS2, Mini Multi Shaker, Adjustable - 3D & 2D Motion

- BAE MECHANISM (patented, 5 step angle adjustment system) allows orbital motion and various twist movement
- Sealed construction to prevent heat transfer from motor to platform for use in incubator and cold chamber
- Variable speed control, from 5 to 90rpm
- Orbit of 18mm for best mixing result especially for gel and blotting
- 20cm x 20cm platform for efficient incubator operation
- Dual mat to accommodate each vessels in the proper mat.

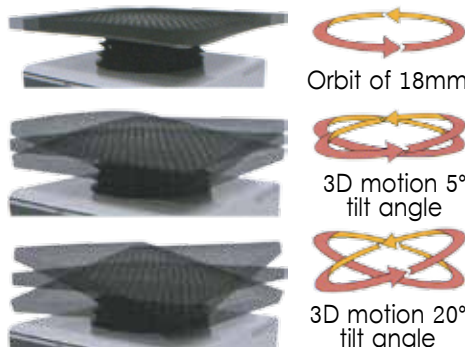
Model	FMS2
Speed range	5 ~ 90rpm
Motor	DC Warm Geared motor
Temp. resist	Lower than 65°C (Hum 90%)
Loadable Weight	1kg
Weight	3kg
Dimensions (mm)	W200xD200xH127
Wattage	50W
Power	Free Voltage (AC100-240V)



### The table for angle adjustment:

Motion Select	FMS2
Orbital Motion	orbit of 18mm 5°,10°, 15°, 20° tilt angle
3D Motion	

### View of actual movements:



### FMS3, Multi Shaker, Extremely quiet operation with various movement position, Adjustable - 3D & 2D Motion

- BAE MECHANISM (patented, 5 step angle adjustment system) allows orbital motion and various twist movement
- Variable speed control, from 30 to 300rpm
- Orbit of 18mm for best mixing result especially for gel and blotting
- High quality permanent DC brush less motor for gentle & powerful motion
- Continuous or timed operation
- Simple and easy of angle adjustment
- Dual mat to accommodate each vessels in the proper mat.



Model	FMS3
Speed range	30 ~ 300rpm
Motor	DC Warm Geared motor
Temp. resist	Lower than 55°C (Dry air 85%)
Loadable Weight	3kg
Timer	180min
Weight	12kg
Dimensions (mm)	W300xD360xH155
Wattage	30W
Power	Free Voltage (AC100-240V)

### The table for angle adjustment:

Motion Select	FMS3
Orbital Motion	orbit of 18mm 5°,10°, 15°, 20° tilt angle
3D Motion	

### Accessories:



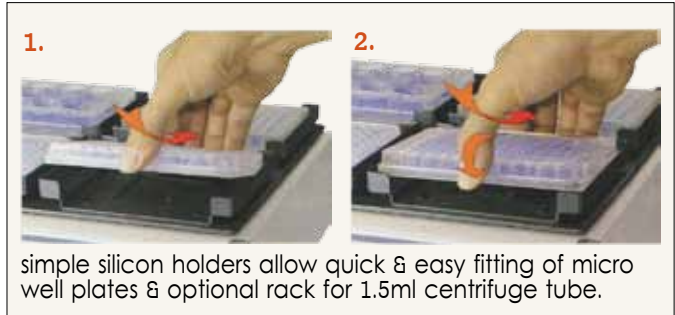
### Other Accessories:

Model	Description
CP50	50ml flask holder
CP100	100ml flask holder
CP250	250ml flask holder
CP500	500ml flask holder
FT302-50-13	Flask Rack for 50ml flask-Capacity: 13ea
FT302-100-13	Flask Rack for 100ml flask-Capacity: 13ea
FT302-250-8	Flask Rack for 250ml flask-Capacity: 8ea
FT302-500-5	Flask Rack for 500ml flask-Capacity: 5ea
FT302	Universal plate for flask holder

S-20/S-40, 2/4 micro digital well plate mixers



- High quality permanent DC brush less motor for gentle and powerful motion
- S-20: Standard platform for 2 micro well plates
- S-40: Standard platform for 4 micro well plates
- Continuous or timed operation
- Optional rack for 1.5ml centrifuge tubes
- Simple silicon holders for easy & speedy of plate installation
- LED display (shown actual speed or time).



simple silicon holders allow quick & easy fitting of micro well plates & optional rack for 1.5ml centrifuge tube.

Plate Installation:

Model		S-40	S-20
<b>Orbit range</b>		3mm	
<b>Speed</b>	<b>Micro well plate &amp; 1.5ml tube</b>	300-1600rpm	300-2000rpm
	<b>deep well plate</b>	300-1400rpm	-
<b>Capacity</b>	<b>micro well plate</b>	4ea	2ea
	<b>deep well plate</b>	4ea	-
	<b>1.5ml tube</b>	96ea	48ea
<b>Timer</b>		99hours 59min	
<b>Dimensions WxDxH (mm)</b>		290x330x141	180x330x131
<b>Weight (kg)</b>		6Kg	5Kg
<b>Wattage</b>		25W	
<b>Power</b>		AC100V-240V (Free Voltage) 50Hz/60Hz	

SI-400, 4 MicroPlate Mixer Shaker



Model	SI-400
<b>Shaking speed</b>	200-1500 rpm - standard 200-1000 rpm - deep well
<b>Orbit</b>	3mm
<b>Timer</b>	1min-99h59min
<b>Power supply</b>	AC220V or AC110V , 2A
<b>Dimensions</b>	280x270x110mm
<b>Weight</b>	7kg

Features:

- Variable speed from 200 to 1,500rpm.
- DC brush less motor for gentle and powerful motion.
- Mixing orbit of 3 mm for efficient mixing in small sample vessels.
- Continuous or timed operation.
- Optional rack for 1.5ml centrifuge tube.
- Simple spring holders for easy & quick of plate installation.
- Aggressive mixing speed from 200-1500rpm for complete and uniform mixing in any microplate format.
- Small vortexing orbit of 3mm for thorough mixing regardless of sample viscosity.
- Speed and orbit combine to offer true vortexing action in each well of a microplate.
- Model may be used in cold rooms and incubators for temp. sensitive applications.
- Built-in timer operates from 1-99 minutes or continuous for hands-free use.



With Optional Tube Rack for 1.5ml Centrifuge Tubes

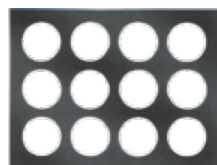
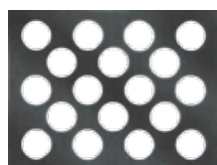
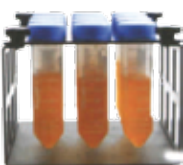
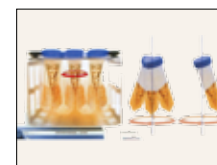
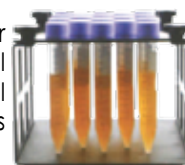
## S-50, Conical tube Mixer



S-50

- Variable speed range: 60–500rpm
- Orbit of 6mm in low speed & orbit of 40mm in high speed
- High quality permanent DC brushless motor for gentle and powerful motion
- Continuous or timed operation
- Rack for 50ml conical tube: 12ea or Rack for 15ml conical tube: 18ea.
- LED display (Shown actual speed or time).

Model	S-50
<b>Orbit range</b>	Low speed-6mm /High speed-40mm
<b>Speed range</b>	60–500rpm
<b>Capacity</b>	conical tube 50ml
	conical tube 15ml
<b>Timer</b>	99hours 59min
<b>Dimensions (mm)</b>	W210xD369xH231
<b>Weight (kg)</b>	8Kg
<b>Wattage</b>	35W
<b>Power</b>	AC100V–240V (Free Voltage) 50Hz/60Hz

Rack for  
12x50ml  
conical  
tubes  
CO-5012Rack for  
18x15ml  
conical  
tubes  
CO-5018

EL-680

## EL-680, Wrist Action Shaker

MRC's Wrist-Action Shaker EL-680 is an effective tool for extracting, dissolving and emulsifying samples. Featuring an advanced motor, the EL-680 mimics human wrist action—from very slow, gentle mixing to violent agitation. This variable speed unit runs from 100–960 oscillations per minute (with gentle ramping), and is monitored within 1 rpm of set point by an illuminated digital tachometer. The control panel is angled away from unit to ease reading and speed adjustment. The shaker has easily detachable arms equipped with 8 clamps for attachment of all types of tubes, flasks and bottles with diameters between 5 and 50 mm. The EL-680 includes a digital timer, rubber feet, and can handle loads up to 9 lbs.

## Features:

- 100–960 oscillations per minute
- 0.340" Stroke (8mm)
- Detachable arms equipped with 8 clamps
- Handle loads up to 9 lbs.

## Specifications:

- **Power Specs:** 115V or 230V @ 50/60hz
- **Dimensions:**  
W(Base) – 33.4" D(Base) – 11.6" H(Base) – 10"
- **Shipping Info:** 1 box: 21"x21"x21" – 60lbs.

## EL-680Q, Wrist Action Shaker

MRC's Wrist-Action Shaker EL-680Q with tooling is an effective tool for extracting, dissolving and emulsifying samples. Featuring an advanced motor, the EL-680Q mimics human wrist action—from very slow, gentle mixing to violent agitation with a 10.5 degree stroke. This variable speed unit runs from 100–600 oscillations per minute (with gentle ramping), and is monitored within 1 rpm of set point by an illuminated digital tachometer. The control panel is angled away from unit to ease reading and speed adjustment. With the EL-680Q & Tooling the user can put in multiple tubes (multiple sizes from 50ml down to 15ml, 12 per arm) at a time. The EL-680Q includes a digital timer, rubber feet, and can handle loads up to 9 lbs.

## Features:

- 100–960 oscillations per minute
- Detachable Tooling arms
- Handle loads up to 9 lbs
- 10.5 Degree stroke.



EL-680Q

## Specifications:

- **Power Specs:** 115V or 230V @ 50/60hz
- **Dimensions:**  
W(Base) – 33.4" D(Base) – 11.6" H(Base) – 10"
- **Shipping Info:** 1 box: 21"x21"x21" – 60lbs.

VS-6/VD-12/VD-12S/V-U, Funnel Shakers



VD-12 with 8x500ml funnel

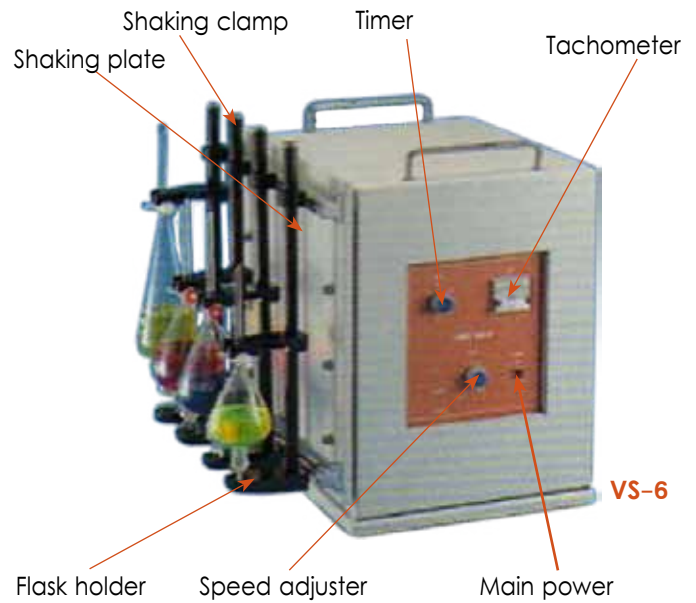


VD-12S with 4x2 liter funnel

This shaker is efficient in shaking evenly reagents of various kinds of materials under same control parameters. it is suitable for organic, inorganic chemical, medical, and pharmaceutical research, extraction & development of media, and waste water analysis. different capacity(0.1~1L) of funnel bottles can be put at one time, funnel holders are movable. 2 Liter of funnel bottle or special size bottle is fixed by larger funnel holder. single, double sides or horizontal type is optional. low noise device, electronic buffer acceleration. with timer, tachometer, and fuse safety device.



V-U



VS-6

Model	100ml	200ml	300ml	500ml	1L	2L	Shaking Frequency	Stock (mm)	Size (mm)	KG
VS-6	6 pcs	6 pcs	4 pcs	4 pcs	3 pcs	-	0-350	40	W430xD430xH580	59
VD-12	12 pcs	12 pcs	8 pcs	8 pcs	6 pcs	-	0-350	40	W430xD710xH710	65
VD-12S	12 pcs	12 pcs	8 pcs	8 pcs	6 pcs	4 pcs	0-350	40	W430xD710xH730	81
V-U	6 pcs	6 pcs	4 pcs	4 pcs	3 pcs	-	0-350	40	W455xD430xH580	60

Dispenser Assortment



FH-A Funnel Holder

TH-B Test Tube rack holder

TH-A Centrifuge tube holder

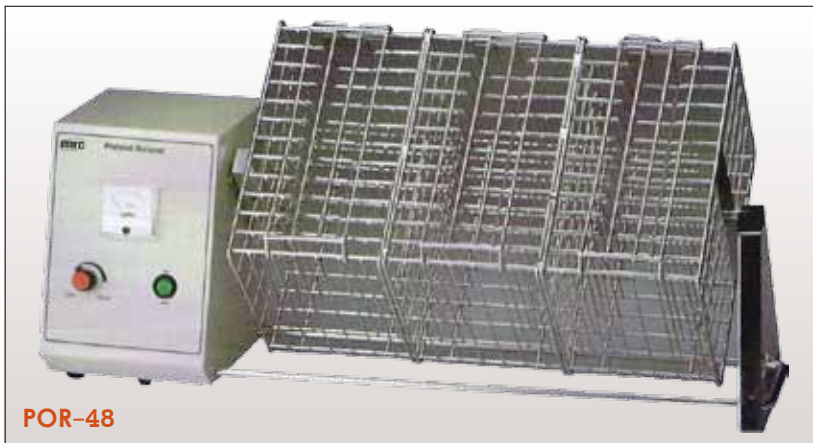
FH-B Triangular flask holder

**POS-42/84, Platelet Shaker****Features:**

Platelet shaker POS-42 and POS-84 are widely used in blood banks • A stationary base drives the storage frame side-to-side 38mm • Removable open mesh shelves provide air circulation • A ball bearing drive motor and internal fan produce durable & reliable operation • Stainless steel shelves can be easily cleaned • POS-42 & POS-84 are easy to use • Quality certification: ISO 9001, ISO 13485.

Model	POS-42	POS-84
Capacity	42 bags	84 bags
Speed	72 rpm (fixed)	
Number of shelf	7 shelves	
Overall dimension (mm)	W460xD350xH360	W840xD350xH360

Power supply: AC 110V 60Hz (220V 50/60Hz available)

**POR-12/24/36/48, Platelet Rotator****Features:**

Platelet rotator POR-12, POR-24, POR-36, POR-48 are widely used in blood tanks • Robust, Practical, and durable design for your economic choice • The storage frame rotates 360° smoothly and steadily • Platelet bags can be loaded easily on the stainless steel basket attached with a tachometer, users can monitor speed easily.

Model	POR-12	POR-24	POR-36	POR-48
Number of basket	1	2	3	4
Capacity	12 bags	24 bags	36 bags	48 bags
Speed	0 ~ 9 rpm			
Size (mm)	W370xD255xH290	W510xD255xH290	W650xD255xH290	W790xD255xH290
Weight(kg)	7.4	9.1	10.3	11.5



**TSS-200, Sieve Shaker**

The TSS-200 test sieve shaker from MRC, produces accurate, consistent results and features constant-controlled amplitude, precise controls, quick-release hold-downs. Maintenance-free, quiet operation; it can be used directly on a laboratory countertop. Belt closing system provides more secure method for placing and removing test sieve stacks in the unit. This belt closing system also enables easier, quieter operation. Sieves, cover and bottom collecting pan are not included.

**Features:**

- One piece construction to prevent cross contamination.
- A high degree of corrosion resistance and ease of cleaning thanks to high-alloy stainless steel.
- Maximum stability and optimum sealing when used in sieve stacks.

**Applications:**

separation, fraction, particle size determination.

**Field of Application:**

Agriculture, biology, chemistry/plastics, construction materials, engineering/electronics, environment, food, glass/ceramics, medicine/pharmaceuticals, mineralogy/metallurgy.

**Examples:**

Cement clinker, chemicals, coffee, construction materials, fertilizers, fillers, flours, grains, metals powders, minerals, nuts, plastics, sand, seeds, soils, washing powder...

**Feed material:**

powders, bulk materials, suspensions.

Sieve: Ø200x60mm



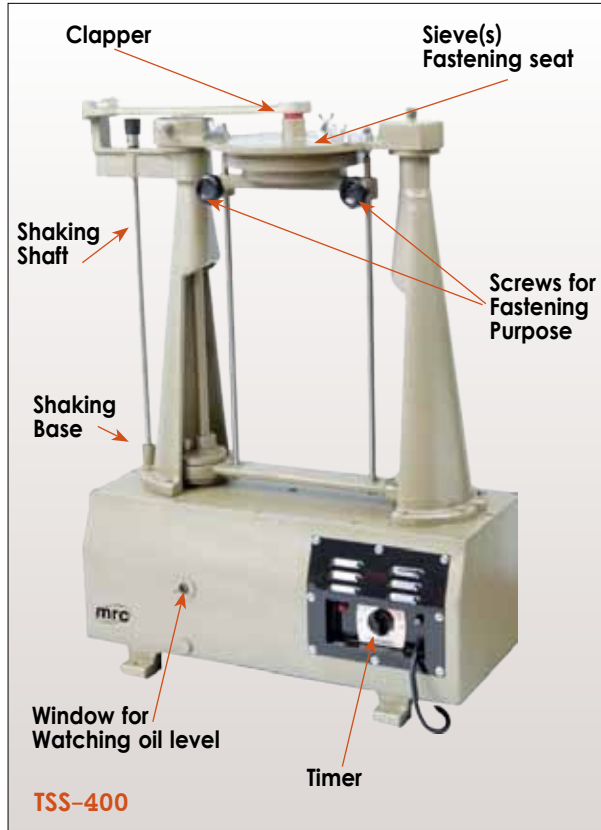
Model	TSS-200	TSS-300
Rotation speed	0~6,000 rpm	
Size of sieve container	Ø200x60mm Max. 8 pcs	Ø300mm Max. 8 pcs
Electronic control	Step-less system	
Timer	Continuous or 0~60 min	
Safety device	Glass fuse 6A	
Power	110/220V, 50/60Hz	
Weight	25Kgs	
Dimension (mm)	300x300x330	

**Sieves Specifications:**

ASTM mesh	4"	3-1/2"	3"	2-1/2"	2"	1-1/2"	1-1/4"	1"	3/4"	5/8"
Size (mm)	101.60	88.900	76.200	63.500	50.800	38.100	31.700	25.400	19.100	15.900
ASTM mesh	1/2"	3/8"	1/4"	3-1/2	4	5	6	7	8	10
Size (mm)	12.700	9.520	6.350	5.660	4.760	4.000	3.360	2.830	2.380	2.000
ASTM mesh	12	14	16	18	20	25	30	35	40	45
Size (mm)	1.680	1.410	1.190	1.000	0.840	0.710	0.590	0.500	0.420	0.350
ASTM mesh	50	60	70	80	100	120	140	150	160	170
Size (mm)	0.297	0.250	0.210	0.177	0.149	0.125	0.105	0.104	0.096	0.088
ASTM mesh	180	200	230	250	270	300	325	350	400	500
Size (mm)	0.080	0.074	0.062	0.061	0.053	0.050	0.044	0.040	0.037	0.025

**TSS-400, Sieve Shaker, Floor Type, Rotating & Tapping motion**

TSS-400 shaker has excellent separating capabilities by rotating very gently. This heavy duty floor model product is designed to produce rotating and tapping motion, with a continuous duty motor.



- Offers excellent separating and sieving performance.
- Designed to install and remove sieves easily.
- Heavy duty, stationary unit. Recommended for use in testing applications requiring material 635 mesh (20 microns) and greater in size.
- Rotating and tapping motions.
- The tapping motion is given by hammer from top.
- A 60 minutes timer.
- Sieves, cover & bottom collecting pan are not included.
- This shaker is heavy in construction & no special foundation is required.
- The machine can accommodate 7 test sieves + set of Lid-pan but is supplied without sieves.

**Sieve: Ø200x60mm**

Model	TSS-400
<b>Rotation speed</b>	246/291rpm
<b>Size of sieve container</b>	φ200x60 Max. 8 pcs
<b>Hammer Speed (up/down)</b>	65/78rpm
<b>Timer</b>	"NO" or 0~60 min
<b>Safety device</b>	110V (FUSE 6A)/220V (FUSE 10A)
<b>Power</b>	110/220V, 50/60Hz
<b>Weight</b>	168Kgs
<b>Dimension (mm)</b>	D400xW750xL950

**TALS-200/300/400, Sieve Shaker**

The TALS model is a multi-purpose sieve shaker that was developed at our Company and incorporates many improvements allowing it to handle most of the problems that usually arise in sieving all kinds of materials. During each development state special emphasis was put on convenience of the laboratory operator. The operating panel includes: power switch and mechanical timer for up to 30 min. The sieves are fastened to the device by rapid screws, a great time saver. The transparent cover allows observing the course of sieving.

Also the mechanical structure was highly enhanced to the point that they increase the operating power by about 30%, while at the same time reducing the noise level. The device is capable of operation in three modes: sieving, shaking and bouncing and banging. The operating power is adjustable.

Shaking: from 1000 to 3000 microns.

Bouncing: from 125 to 1100 amplitudes/min.

Banging: this action complements the bouncing and serves to "free" the mesh from irregularly shaped particles that plug up the sieve in the course of sieving.

Wet sieving is possible: liquids would be supplied through the cover and slanting bottom with a drain for collecting the liquid material.

The device is suitable for sieves from 8 to 200 mm (3", 10 cm, 15 cm, 30 cm and 45 cm sieves may also be used).

Dimensions: width: 34 cm, length: 39 cm, height: 17 cm.

Total height, including the sieve holding head is 70 cm.

Weight: about 16 kg.

Shakers	Sieves
<b>TALS-200</b>	8" or 200mm
<b>TALS-300</b>	up to 300mm
<b>TALS-400</b>	up to 400mm





**SPECTRO-V11D**

**Features:**

- Large LCD Screen (128x64 Dots).
- Wavelength can be read out from the screen directly.
- Auto Zero and Blank.
- Parallel port, printed directly.
- Large sample compartment, it can accommodate 5-100mm path length cuvettes with optional holders.
- Pre-aligned design ensures the user can change lamp conveniently.
- Optional software PC software M.Wave Professional can expand the applications to Standard Curve Kinetics & wave length scan.
- High quality silicon photometric diode detector and 1200 lines/mm grating ensure high accuracy and precision.

**SPECTRO V11D/UV11**

V11D is the only model of manually setting wavelength in MRC families, but precise design and high quality components ensures excellent performance. It is widely used in high schools & colleges for general analysis & experiments. Include basic software, 10mm 4 cell Holder 4x Glass 10mm cuvette.

Model	SPECTRO-V11D	SPECTRO-UV11D
<b>Wavelength range</b>	325-1000nm	200-1000nm
<b>Spectral Bandwidth</b>	4nm	
<b>optical system</b>	Single Beam , Grating 1200 lines/mm	
<b>Wavelength Accuracy</b>	±2nm	
<b>Wavelength Repeatability</b>	1nm	
<b>Wavelength Setting</b>	Manual	
<b>Photometric Accuracy</b>	≤ ±0.5%T or ±0.003A@1A	
<b>Photometric Range</b>	0-200%T , -0.3 -3A, 0-1999Conc.	
<b>Stray Light</b>	0.3%T	
<b>Stability</b>	±0.004A/h @500nm	
<b>Display</b>	128*64 Dots LCD	
<b>Photometric Mode</b>	T, A, C, F	
<b>Detector</b>	Silicon Photodiode	
<b>Standard Cell Holder</b>	4-position 10mm cell changer	
<b>Sample Compartment</b>	Standard 10mm pathlength cuvette	
<b>Light Source</b>	Tungsten Lamp	Tungsten & Deuterium lamp
<b>Output</b>	USB Port & Parallel Port (printer)	
<b>Power Requirement</b>	AC 85V~265V 50/60Hz	
<b>Dimensions (WxDxH)</b>	480x360x160mm	
<b>Weight</b>	10kg	12kg



**SPECTRO-V12**

SPECTRO-V/UV-12, UV-11 spectrophotometer is the ideal instrument for education and QC laboratories. Using your standard sample solutions, you can get a standard curve on the large LCD screen. They are widely used in colleges and enterprises for general quantitative analysis and experiments. Include basic software, 10mm 4 cell Holder 4xGlass 10mm cuvette.

**SPECTRO-V12/UV12/UV11**

**Features:**

- Large LCD screen(128x64 Dots)
- Can display total 50 groups of data, 3 groups per screen. Can display standard curve and the curve equation.
- System can also save the test results. Total 200 groups of data and 100 standard curves can be saved; it is convenient for check and reload.
- Data can be restored after a sudden power cut.
- Auto setting wavelength.
- Tungsten lamp & Deuterium lamp can be tuned on/off individually to extend lifetime.
- Pre-aligned design makes it convenient to change lamps.
- Large sample compartment, it can accommodate 5-100mm path length cuvettes with optional holders. A variety of optional accessories are available.
- The optional application software M.Wave Professional provides complete control of the spectrophotometer through the Built-in USB port. You can achieve the following functions: **I.** Quantitative; **II.** Kinetics; **III.** Wavelength Scan; **IV.** Multi Wavelength; **V.** DNA/Protein.

Model	SPECTRO-V12	SPECTRO-UV12	SPECTRO-UV-11
<b>Wavelength range</b>	325-1000nm	200-1000nm	
<b>Spectral Bandwidth</b>	4nm		
<b>optical system</b>	Single Beam , Grating 1200 lines/mm		
<b>Wavelength Accuracy</b>	±2nm		
<b>Wavelength Repeatability</b>	0.8nm	1nm	
<b>Photometric Accuracy</b>	≤ ±0.5%T or ±0.003A@1A		
<b>Photometric Range</b>	0-200%T , -0.3 -3A, 0-9999Conc.		
<b>Stray Light</b>	0.3%T		
<b>Stability</b>	±0.002A/h @500nm		
<b>Detector</b>	Silicon Photodiode		
<b>Standard Cell Holder</b>	4-position 10mm cell changer		
<b>Sample Compartment</b>	Standard 10mm pathlength cuvette		
<b>Light Source</b>	Tungsten Lamp	Tungsten & Deuterium lamp	
<b>Output</b>	USB Port & Parallel Port (printer)		
<b>Power Requirement</b>	AC 110/220V 50/60Hz		
<b>Dimensions (WxDxH)</b>	470x370x180mm		
<b>Weight</b>	12kg	14kg	



## SPECTRO V-16/UV-16/V-18/UV-18 Series

MRC 16/18 Series are simple-to-use instruments with advanced performance, its stray light is only 0.05% T. The local stand-alone software provides functions of Photometry, Quantitative Test, Kinetics and System Utilities functions.

Model	SPECTRO-V16 SPECTRO-V16PC	SPECTRO-V18 SPECTRO-V18PC	SPECTRO-UV16 SPECTRO-UV16PC	SPECTRO-UV18 SPECTRO-UV18PC
<b>Wavelength range</b>	320-1100nm		190-1100nm	
<b>Spectral bandwidth</b>	4nm	2nm	4nm	2nm
<b>Optical system</b>	Single beam, grating 1200 lines/mm			
<b>Wavelength accuracy</b>	±0.5nm			
<b>Wavelength repeatability</b>	0.3nm			
<b>Photometric accuracy</b>	≤±0.5%T or ±0.003A@1A			
<b>Photometric range</b>	-0.3 -3A, 0-200%T, 0-9999Conc.			
<b>Stray light</b>	≤0.05%T@360nm		≤0.05%T@220nm, 360nm	
<b>Stability</b>	±0.002A/h @500nm			
<b>Display</b>	Graphic LCD(128*64dots)			
<b>Keyboard</b>	22 membran keypad			
<b>Standard cell holder</b>	Standard 10mm pathlength cuvette			
<b>Sample Compartment</b>	4-position 10mm cell changer			
<b>Light source</b>	tungsten	tungsten & Deuterium lamp		
<b>Output</b>	USB Port & parallel port (printer)			
<b>Power requirement</b>	AC 110/220V 50/60Hz			
<b>Dimensions (WxDxH)</b>	470x370x180mm			
<b>Weight</b>	12kg		14kg	

### Features:

- Large LCD screen(128x64 Dots)
- System can also save the test results, total 200 groups of data 100 standard curves can be saved in the RAM. Convenient for check and reload.
- Data can be stored after a sudden power cut.
- Auto setting wavelength.
- Tungsten lamp & deuterium lamp can be tuned on/off individually to extend lifetime.
- The optional application software M.Wave Professional provides complete control of the spectrophotometer from a computer through the Built-in USB port. It can expand to the following functions: Quantitative, Kinetics, Wavelength Scan, Multi-wavelength& DNA/Protein Test.

- Pre-aligned design makes it convenient to change lamps.
  - Large sample compartment, it can accommodate 5-100mm path length cuvettes with optional holders. A variety of optional accessories are available.
- Include basic software, 10mm 4 cell Holder 4xGlass 10mm cuvette.

### MRC 16/18 Series Local Control Software



Main Menu

No.	WL	Abs.
1	230.0	0.001
2	340.0	0.000
3	450.0	0.002
4	540.0	0.000
5	620.0	0.003

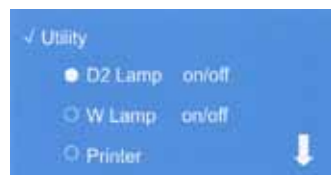
Basic Mode



Quantitative



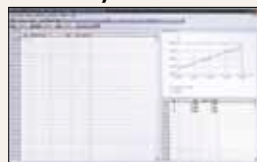
Kinetics



System Utilities

### M.Wave Professional PC-Control Software

M.Wave Professional application software is based Microsoft Windows, the instrument can be controlled by PC software through the built-in USB communication port, which makes the UV11 Series with more functions and easy to control.



#### Quantitative:

Use up to 20 standards to establish standard curve. Three methods for fitting a curve:  
1-Linear fit 2-Linear through zero 3-Square fit



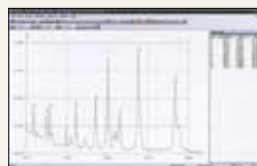
#### Kinetics:

The Kinetics mode may be used for time course scanning or reaction rate calculations. Abs. Vs. Time graphs is displayed.



#### Wavelength Scan:

Automatically records peaks and valleys. The quantity of the curves stored is unlimited. Post-run manipulation & processing includes. Re-scaling axes, curve. Smoothing, combination, zooming, overlap... 1st to 4th derivative.



#### Multi-wavelength Test

You can set up to 20 wavelengths to measure a sample.



#### DNA/Protein Test:

Optional two formulas: DNA Concentration = 62.9 \* A<sub>260</sub> - 36.0 \* A<sub>280</sub> Or 49.1 \* A<sub>260</sub> - 75.8 \* A<sub>230</sub>  
You can also enter other wavelengths and factors to calculate.



**SPECTRO-UV3 Series**

**SPECTRO-UV3, Scanning Spectrophotometer**

SPECTRO-UV3 Series is an advanced single beam design consisting of 10 models. They differ in bandwidth and wavelength accuracy, but provide excellent performance for measurements in the range of 190nm to 1100nm. They are suitable for clinical lab applications, pharmaceutical, and bio-chemical, as well as routine applications such as Quantitative analysis, Kinetics, Wavelength Scan, Multi-Wavelength, and DNA/Protein analysis. UV-Vis Analyst application software based Microsoft Windows makes these instruments versatile.

All instruments provide excellent performance for measurements. They are divided into in two types: PC models and stand-alone models.

**Features:** Fixed or variable slits (bandwidths) Sealed, solvent-resistant tactile keypad with alpha-numeric entry for file names and units. Pre-aligned deuterium lamp for easy lamp replacement. The status of the lamps may be monitored Powerful built-in program or PC Windows based software UVVis Analyst including sophisticated utility programs. Data Download-to-PC software for stand-alone models (optional) Real-time clock for date and time stamping of results.

- In Stand-alone models, all software methods are included as built-in standard; this eliminates the need of software.
- Online software update via internet.
- Data can be downloaded.
- The PC models come standard with Windows based application software UV-Vis Analyst.

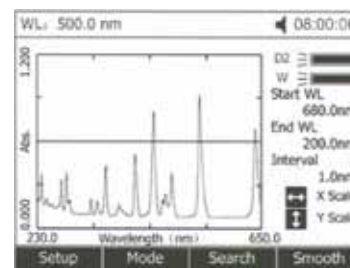
Model	SPECTRO-UV30 SPECTRO-UV30PC	SPECTRO-UV31 SPECTRO-UV31PC	SPECTRO-UV32 SPECTRO-UV32PC	SPECTRO-UV32S SPECTRO-UV32PCS	SPECTRO-UV33 SPECTRO-UV33PC
<b>Wavelength range</b>	190-1100nm				
<b>Spectral bandwidth</b>	4nm	2nm	1.8nm	0.5/1/2/4nm	1nm
<b>Optical system</b>	Single beam, grating 1200 lines/mm				
<b>Wavelength accuracy</b>	±0.5nm		±0.3nm		
<b>Wavelength repeatability</b>	0.3nm		0.2nm		
<b>Scan speed</b>	Hi, Med, Low, Max.3000nm/min				
<b>Photometric accuracy</b>	≤±0.5%T or ±0.003A@1A				
<b>Photometric range</b>	-0.3 -3A, 0-200%T				
<b>Stray light</b>	≤0.05%T@220nm, 360nm				
<b>Stability</b>	±0.002A/h @500nm				
<b>Display</b>	5 inches LCD (320x240 dots)				
<b>Baseline flatness</b>	±0.002A(200-1000nm)				
<b>Standard cell holder</b>	Standard 10mm pathlength cuvette				
<b>Light source</b>	Halogen & Deuterium lamp (pre-aligned)				
<b>Output</b>	USB Port & parallel port (printer)				
<b>Power requirement</b>	AC 110/220V 50/60Hz				
<b>Dimensions (WxDxH)</b>	480x360x160mm		600x450x200mm		
<b>Weight</b>	14kg		20kg		

**SPECTRO-UV3 Series Local Control Software**

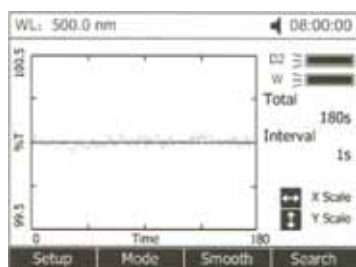
All methods are included as built-in standard; this eliminates the need of software. Online software update via Internet. The local control software includes functions such as: Photometry, Quantitative, Wavelength Scan, Kinetics, DNA/Protein, Multi-wavelength and System Utilities.



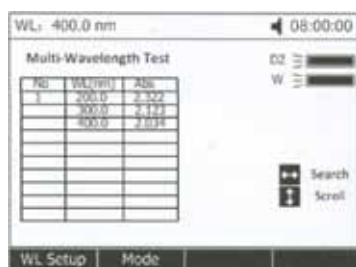
**Standard Curve**



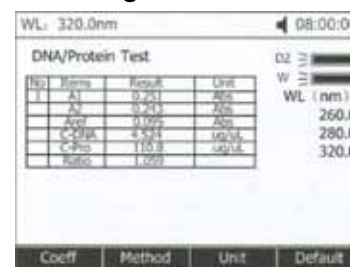
**Wavelength Scan**



**Kinetics**



**Multi-Wavelength**



**DNA/Protein Test**



**SPECTRO-UV6 Series**

### SPECTRO-UV6 Series, Double Beam Spectrophotometer

SPECTRO-UV6 Series is an advanced double beam design consisting of six models.

Stand-alone model:

SPECTRO-UV61 with 1.8nm fixed bandwidth

SPECTRO-UV63 with 1.0 fixed bandwidth.

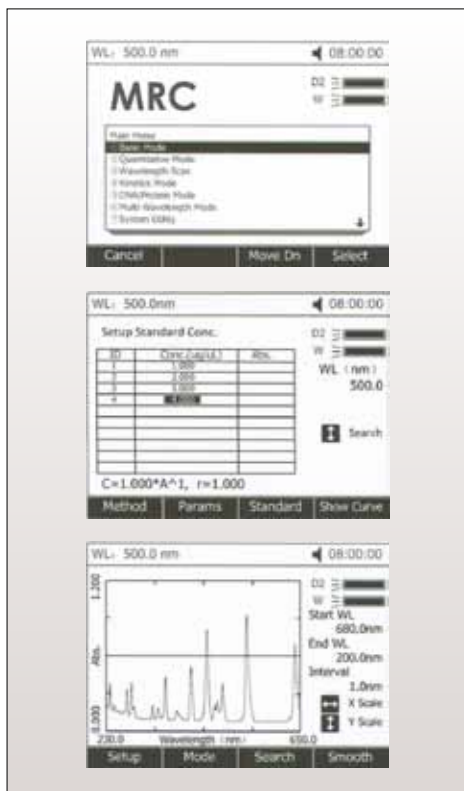
SPECTRO-UV61S with variable bandwidth: 0.5/1/2/5nm

- Fixed or variable slits (bandwidths)
- For Stand-alone models, all software methods are included as built-in standard; this eliminates the need of software.
- Online software upgrade via internet helps to keep it updated.
- Data Download-to-PC software expands the data storage to unlimited.
- The stand-alone models has 5 inch screen and the PC models has UVNis Analyst software. Stand-alone models of SPECTRO-UV6 Series have the same functions as SPECTRO-UV3 Series, see next page for details.

Other specifications of the six models are almost the same except bandwidth. The two detectors measure sample and reference respectively and simultaneously for optimizing measurement accuracy, They provide excellent performance for measurements in the range of 190 to 1100nm, They are suitable for pharmaceutical, biochemical and clinical lab applications as well as routine applications such as quantitative analyses, kinetics, wavelength scan, multiple components and DNA/Protein, PC Windows application software make these instruments versatile. All instruments provide excellent performance for measurements.

Model	SPECTRO-UV61 SPECTRO-UV61PC	SPECTRO-UV63 SPECTRO-UV63PC	SPECTRO-UV61S SPECTRO-UV61PCS
<b>Wavelength range</b>	190-1100nm		
<b>Spectral bandwidth</b>	1.8NM	1nm	0.5/1/1/4nm
<b>Optical system</b>	Double beam, grating 1200 lines/mm		
<b>Wavelength accuracy</b>	±0.3nm		
<b>Wavelength repeatability</b>	0.2nm		
<b>Scan Speed</b>	Hi, MED., LOW., MAX.3000nm/min		
<b>Photometric accuracy</b>	≤±0.3%T or ±0.002A@1A		
<b>Photometric range</b>	0-200%T, -0.3 -3A		
<b>Stray light</b>	≤0.05%T@220nm, 360nm		
<b>Stability</b>	±0.001A/h @500nm		
<b>Display</b>	5 inches LCD(320*240 dots)		
<b>Baseline Flatness</b>	±0.001A		
<b>Standard cell holder</b>	Standard 10mm single cell holder(2 pcs)		
<b>Sample Compartment</b>	Standard 10mm pathlength cuvette		
<b>Light source</b>	tungsten & Deuterium lamp(pre-aligned)		
<b>Output</b>	USB Port & parallel port (printer)		
<b>Power requirement</b>	AC 110/220V 50/60Hz		
<b>Dimensions (WxDxH)</b>	600x450x200mm		
<b>Weight</b>	22kg		

### SPECTRO-UV6 Series Local Control Software



All methods are included as built-in standard; this eliminates the need of software. Online software update via Internet.

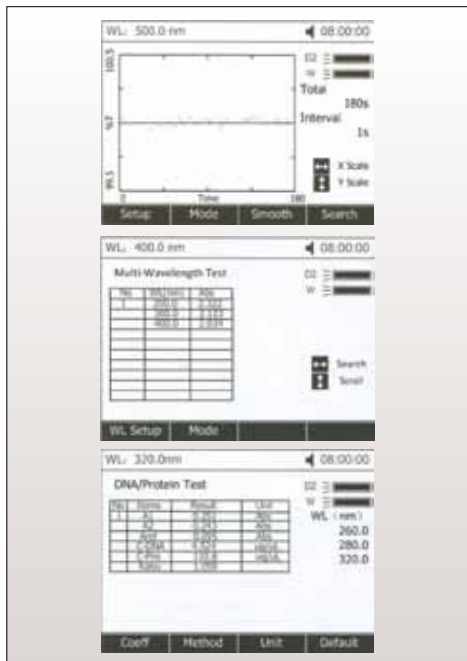
The local control software includes functions such as: Photometry, Quantitative, Wavelength Scan, Kinetics, DNA/Protein, Multi-wavelength and System Utilities.

#### Standard Curve-

Up to 10 standard solutions may be used to establish calibration equation curve. There is a choice of four methods for fitting curve through the calibration points: Linear fit, Linear fit through zero, square fit and cubic fit.

#### Wavelength Scan

The Wavelength Scan intervals are 0.1, 0.2, 0.5, 1, 2, 5nm, and High, Medium and Low scan speeds are available. Scan speeds vary from 100 to 1000 nm/min. Wavelengths are scanned from high to low so that the instrument stand-by at high wavelength. This minimizes the degradation of UV sensitive samples. Precise control of filter and lamp changes means that their effects are not seen on the final scan. Post-run manipulation includes re-scaling axes, curve tracking and peak picking.



**Kinetics**

This mode may be used for time course scanning or reaction rate calculations. Abs. vs. time graphs is displayed on the screen in real time. Wait time and measurement time up to 12 hours may be entered with time intervals of 0.5, 1, 2,5, 10, 30, seconds and 1 min. Post-run manipulation includes re-scaling, curve tracking and selection of the part of the curve required for the rate calculation. Rate is calculated using a linear regression algorithm before multiplying by the entered factor.

**Multi-Wavelength**

Up to 10 wavelengths may be entered, allowing the measurement of multiple wavelengths on a Series of Samples.

**DNA/Protein Test**

Concentration and DNA purity are calculated absorbance ratios 260nm/280nm or 260nm/230nm with optional subtracted absorbance at 320nm

DNA Concentration= $62.9 \cdot A_{260} - 36.0 \cdot A_{280}$  Or  $49.1 \cdot A_{260} - 3.48 \cdot A_{230}$   
 Protein Concentration= $1552 \cdot A_{260} - 757.3 \cdot A_{280}$  Or  $183 \cdot A_{260} - 75.8 \cdot A_{230}$   
 Other wavelengths and factors may be entered.

**UV/Vis Analyst for SPECTRO-UV3 & SPECTRO-UV6 Series**

The MRC Windows based PC application software UV/Vis Analyst takes the best features of the stand-alone version plus more powerful data processing, expanded data collecting, and storage capability. It comes standard with PC models and is optional to stand-alone models.



**The PC application software offers:**

- Photometric Mode • Quantitative test (standard curve) • Wavelength Scan • Kinetics • DNA/Protein • Multi-Wavelength • System Utility.

**Quantitative Test (Standard curve)**

Use up to 20 standards to establish standard curve. Four methods for fitting a curve:

- Linear fit
- Linear through zero
- Square fit
- Cubic fit

**Wavelength Scan**

Automatically record peaks and valleys. The quantity of channels is unlimited; you can simultaneously store as many as desired.

Post-run manipulation and processing includes:

- Re-scaling axes, curve
- 1 st to 4th derivative
- Smoothing, combination, zooming, overlap.

**Kinetics (Abs vs. Time)**

The Kinetics mode may be used for time course scanning or reaction rate calculations. Abs. Vs. Time graphs are displayed on the screen in real time. Waiting time, measurement time and time intervals may be entered.

Post-run manipulation includes re-scaling, curve tracking and selection of the part of the curve required for the rate calculation.

Rate is calculated using a linear regression algorithm before multiplying by the entered factor.

**DNA/Protein**

Concentration and DNA purity are quickly and easily calculated: Absorbance ratios 260nm/280nm with optional subtracted absorbance at 320nm.

DNA Concentration= $62.9 \cdot A_{260} - 36.0 \cdot A_{280}$   
 Protein Concentration= $1552 \cdot A_{260} - 757.3 \cdot A_{280}$   
 Other wavelengths and factors may be entered.




**Multi-wavelength**

Up to 20 wavelengths can be selected and multiple samples can be measured. (Auto cell changer is required to run multiple samples automatically)


## Accessories – Holder:


				
4-Cell Holder for 10mm Squ. Cuvette	4-Cell Holder for up to 50mm Squ. Cuvette	Reflectance Measurement Attachment (50 incident angle)	Cylindrical Cell Holder	Water-Jacketed Single Cell Holder
				
Micro Cell Holder	Test Tube Holder	8-Position Auto Cell Changer	Solid Sample Holder (Single Cell)	10mm Water-Jacket 4-Cell Holder


## Accessories – Others:

		
Thermal Printer	Stylus Printer	1. Peltier Unit 2. Sipper Unit 3. Peltier/Sipper System

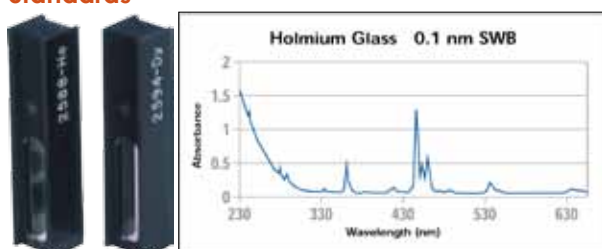
## Accessories – Cells:

Square Cuvette			
Name&Specifications	P.N	Remark	
Square Cuvettes. Glass 10mm	<b>916101</b>	/4pcs	
Square Cuvettes. Glass 20mm	<b>916102</b>	/4pcs	
Square Cuvettes. Glass 30mm	<b>916103</b>	/4pcs	
Square Cuvettes. Glass 50mm	<b>916104</b>	/4pcs	
Square Cuvettes. Glass 100mm	<b>916105</b>	/4pcs	
Square Cuvettes. Quartz 10mm	<b>916111</b>	/2pcs	
Square Cuvettes. Quartz 20mm	<b>916112</b>	/2pcs	
Square Cuvettes. Quartz 30mm	<b>916113</b>	/2pcs	
Square Cuvettes. Quartz 50mm	<b>916114</b>	/2pcs	
Square Cuvettes. Quartz 100mm	<b>916115</b>	/2pcs	

Micro Cell			
Name & Specifications	P.N	Remark	
100UL Micro Cell	<b>916121</b>	/1pcs	
Square Cuvettes. Glass 20mm	<b>916122</b>	/1pcs	
Square Cuvettes. Glass 30mm	<b>916123</b>	/1pcs	

Flow Cell			
Name & Specifications	P.N	Remark	
5mm SEIF Masking Cont. Flowthrough G.Cell	<b>916131</b>	/1pcs	
10mm SEIF Masking Cont. Flowthrough G.Cell	<b>916132</b>	/1pcs	
20mm SEIF Masking Cont. Flowthrough G.Cell	<b>916133</b>	/1pcs	
30mm SEIF Masking Cont. Flowthrough G.Cell	<b>916134</b>	/1pcs	
5mm SEIF Masking Cont. Flowthrough Q.Cell	<b>916141</b>	/1pcs	
10mm SEIF Masking Cont. Flowthrough Q.Cell	<b>916142</b>	/1pcs	
20mm SEIF Masking Cont. Flowthrough Q.Cell	<b>916143</b>	/1pcs	
30mm SEIF Masking Cont. Flowthrough Q.Cell	<b>916144</b>	/1pcs	

## Standards



**SPECTRO-NANO-G, Nano Photometer**



**Professional Testing Result**

**Reference: pure water**

- Path-length: 0.2mm
- Sample volume: 2ul
- Diluted 1, 2times, and 4 times at approximately 5700ng/ul
- DNA Concentration [ng/ul] shows the maximized absorbance at 260nm.
- DNA Concentration [ng/ul]= A (260) \* factor 50

**Sample: 1000ng/μlK2Cr207**

- Path-length: 0.2mm
- Sample volume: 2ul
- Diluted to 10,25,50,100,250,500,750 1000ng/ul
- The test shows the result at 260nm has a very good linear.
- R2=0.9998, It is very near to 1.

**• Small**

0.2μl sample volume. Particular sample holder designing allows to testing low volume DNA, protein.

**• Fast**

One Step, One Movement. Drop, close and turn round measure directly from 190–1100nm, easy to operate.

**• Accurate**

No light loss for whole testing. All light goes through sample to avoid light loss to make the result more accurate.

**• Easy Cleaning**

No special material needed. Just use the carton swab to clean the sample solution.

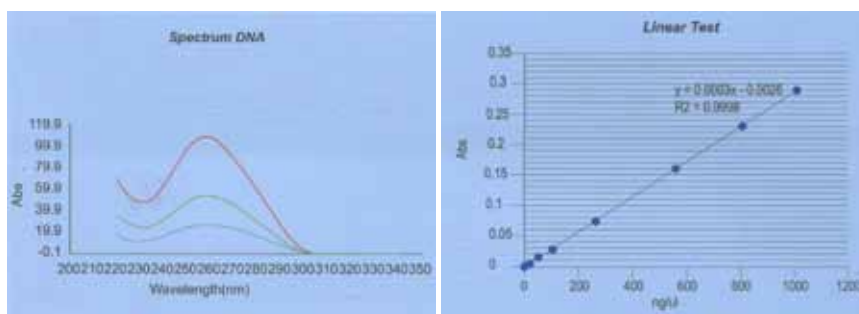
**• Economic**

Special design to make low cost.

**• Multi-function**

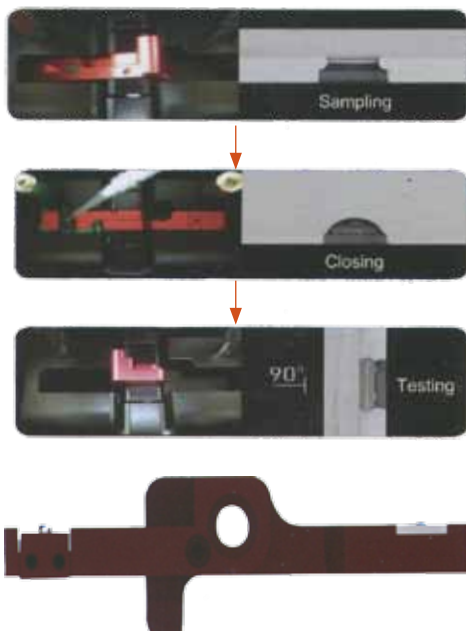
More function than special low volume testing. Quantitative. Wavelength Scan, Kinetics, Multi-Wavelength.

**• Settled in one step**



**Technical Specification**

Small Volume Option	
Path Length	0.2mm
Minimum Sample Size	0.2~2.0μl
Concentration Range	2.5~7500ng/μl (ds-DNA)
Lower Limit of Detection	10ng/μl
Maximum Concentration	5000 ng/μl (dsDNA)
DNA reproducibility	< ±1.0% (dsDNA, at 1000ng/μl)
Spectromodule	
Wavelength Range	190~1100nm
Spectral Bandwidth	4.0nm
Optical System	Single Beam, Grating 1200 lines/mm
Wavelength Accuracy	0.5nm
Wavelength Repeatability	0.3nm
Scan Speed	Hi, Med, Low, Max. 3000nm/min
Photometric Accuracy	±0.5%T or ±0.004A@1A
Photometric Range	0~200%T, -0.3 ~-0.3A, 0~9999Conc
Stray Light	0.5%T@220, 340nm
Stability	±0.0008A/h @500nm
Display	5 inches LCD (320*240 dots)
Baseline Flatness	0.002A
Light Source	Halogen & Deuterium lamp (pre-aligned)
Output	USB Type A port for USB memory device (right side)
	USB Type B port for optional computer connectivity (back)
	Parallel port for printer
Power Requirement	AC 110/220V 50/60Hz
Dimensions(L*W*H)	491*365*180mm
Wight	14kg
Power Requirement	AC110/220V 50/60Hz

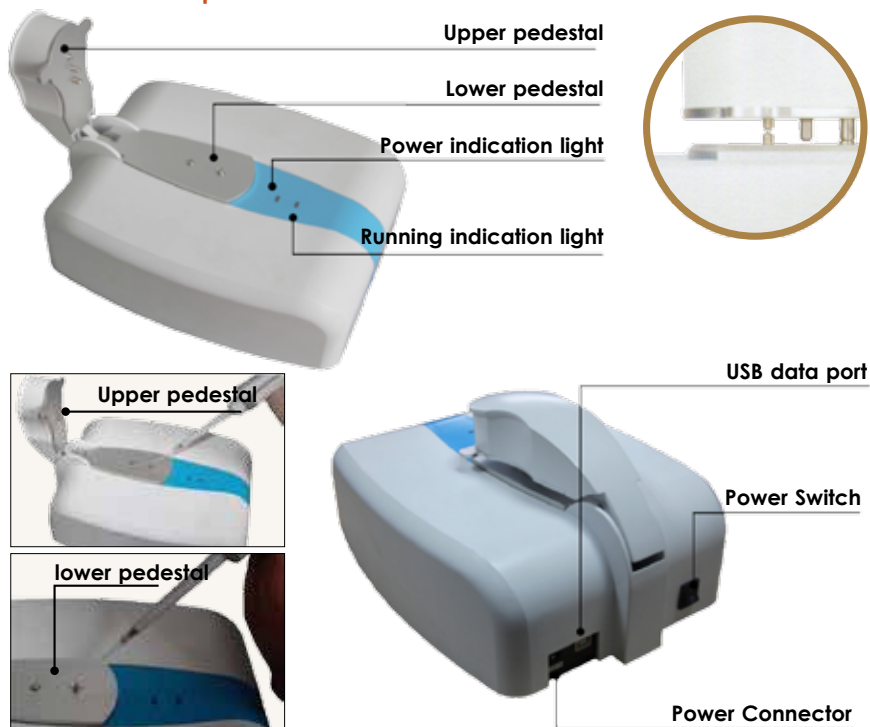


## SPECTRO-NANO, Micro-Spectrophotometer



Spectro-Nano is a perfect instrument for most labs dealing with sample analysis or preparation. It can accurately measure DNA, RNA and oligonucleotide calculations, protein assays etc.. The system utilizes CCD detector, a Xenon light source for long lamp lifetimes together with simple software. Simple pipette 0.5-2ul sample onto the pedestal, laying down the sampling arm, it can automatically complete the measurement within 5 seconds.

### Structure Description:



### Nucleic Acids Measurement Result:



### Features:

- Direct, easy measurements in less than 5 seconds: just pipette & wipe
- Full spectral output
- Measures DNA, RNA (A260) and Protein (A280), concentrations and sample purity (260/280 ratio)
- Large concentration range without dilutions
- User-friendly software that includes Custom Methods and data export capabilities
- Low-cost operation-no plates or other consumable
- Complete with user friendly software packed with features.

Model	SPECTRO-NANO
Wavelength Range	200~800nm
Minimum Sample Size	0.5~2.0ul
Path Length	0.2mm (For high concentration measurements) 1.0mm (For ordinary)
Light Source	Xenon flash lamp
Detector Type	3864-element linear silicon CCD array
Wavelength Accuracy	1nm
Spectral Resolution	≤ 3 nm (FWHM at Hg 546 nm)
Absorbance Precision	0.003 Abs
Absorbance Accuracy	1% (at 0.76 at 350 nm)
Absorbance Range	0.02 - 75 (10mm equivalent)
Measurement Time	< 5s
Dimensions (W x D x H)mm	200 x 262 x 154
Weight	2.5kg
Sample Pedestal Material	Aluminum alloy and Quartz fiber
Operating Voltage	12V DC
Operating Power Consumption	12 - 18 W
Standby Power Consumption	5W
Software Compatibility	Windows 7, Windows XP





**SPECTRO-96**

<b>Display Mode</b>	4 digits LED
<b>Dimension</b>	L550×W510×H365mm
<b>Weight (Kg)</b>	11(N) 13(G)kgs

**Applications & Features:**

Fluorescence analysis is a high sensitive and high selective sophisticated analytical method. This method can provide information including excitation and emission spectrum, emission light intensity and measurement of life of emission light & polarization fluorescence etc. This method can provide a wide lineal range of working curve. It has becoming an important analytical method in the region of trace analysis. This method has been used in:

- Medical science and clinical analysis Clinical analysis of biological specimen
- Pharmaceutical science and pharmacology Analysis of natural pharmaceutical products; Quality control of pharmaceuticals and research of pharmaceutical metabolites
- Biochemistry Analysis of minute quantity of substances in biological body
- Food industry Analysis of minute quantity of constituents in food
- Pollution analysis Atmospheric pollution, environmental testing and food contamination analysis
- Organic and inorganic chemistry Used in the trace analysis in case of those substances cannot be determined by absorption spectrophotometry.

**Standard Package:**

<b>Main instrument</b>	1 set
<b>365nm filter (Pre assembled)</b>	1 pc
<b>software package</b>	1 set
<b>Power cable</b>	1 pc
<b>USB wire</b>	1 pc
<b>Instruction manual</b>	1 copy
<b>Product quality certificate</b>	1 copy
<b>Fuse (2A)</b>	2 pcs
<b>Fuse (5A)</b>	2 pcs
<b>Quartz fluorescence cell 10mm</b>	1 pair
<b>Packing list</b>	1 copy

**SPECTRO-96, Spectrofluorometer**

**Features:**

- Two operation modes could be chosen: fluorescence intensity and luminous intensity. Fluorescence scanning, kinetic determination and quantity analysis could be done under fluorescence intensity mode
- 365nm exciting wavelength Raman peak of water in 1 cm quartz fluorescence cuvette S/N≥150 High performance sensitivity simplifies the measurement of low detective sample
- 10 stages gain adjustment could be chosen for emission spectrum scanning, including high speed low S/N scanning and precise scanning. Total spectrum scanning could be done in 1 second. With the intelligent pre scanning feature, unknown sample's spectrum information could be detected rapidly. Auto-omission of the influence of scattering peak and harmonic peaks, it ensure the best measurement parameters and locate the fluorescence emission peak
- Support off-line mode and on-line mode. Under off-line mode, instrument's computer system offer the fluorescence intensity measurement, concentration direct reading, auto 0 adjustment, auto background subtraction and etc. Under on-line mode, we could use quality and quantity software to control data acquisition and analysis through USB2.0 interface
- High stable and long life 150W xenon lamp and power source ensure high stable testing and wide range of spectrum
- The normalized feature for fluorescence value could make different fluorescence's result comparable
- Provide optional PC qualitative and quantitative software package with expansible time scanning, wavelength scanning, graphic calculation and storage-access abilities
- Optional accessories for different measurement, including single hole cell holder, fluorescence sample holder for different features, 200µl micro scale centrifuge tube, micro scale capillary sample holder, semi-auto sample introduction accessories, membrane sample accessories, powder sample accessories, jacket sample accessories and etc.

**Optional Spare Parts and Accessories:**

- Fuses (2A/5A)
- 200~700nm interference optical filter (φ25mm)
- Quartz fluorescence sample cell 10mm
- Personal computer
- Printer cable
- Dedicated serial interface printer.

Model	SPECTRO-96
<b>Light source</b>	Hamamatsu 150W Xenon lamp
<b>Exciting optical filters</b>	Interference optical filter
<b>Standard set</b>	equipped with an interference optical filter of central wavelength at 365nm and 10nm bandwidth
<b>optional interference optical filer</b>	25mm diameter of wavelength of 250~700nm
<b>Emission monochromatic</b>	C-T diffraction grating (Em 200~900nm, bandwidth 10nm) Wavelength accuracy±1nm Wavelength repeatability ≤0.5nm
<b>Sensitivity</b>	Raman peak of water in 1 cm quartz fluorescence cuvette with S/N≥150
<b>Linear measurement(r)</b>	≥0.995
<b>Stability</b>	better than 1.5%/10min
<b>Variation of power source</b>	220V±22V 50Hz±1Hz
<b>Response time: (0.1-4)s</b>	(0.1-4)s 6 stages adjustable
<b>Fluorescence display value</b>	0.00~600.00
<b>Data transmission</b>	USB2.0

## FTIR510, FTIR Spectrophotometer



### Features:

- New type cube-corner Michelson interferometer features smaller size and more compact structure, providing higher stability and less sensitive to vibrations and thermal variations than conventional Michelson interferometer.
- Fully sealed damp and dust proof interferometer, adopting high performance, long lifetime sealing material and desiccator, ensures higher adaptability to the environment and increases accuracy and reliability in operation. Viewable window for silica gel enables easy observation and replacement.
- Isolated IR source and large space heat dissipation chamber design provides higher thermal stability. Stable interference is obtained without the need of dynamic adjustment.
- High intensity IR source adopts a reflex sphere to obtain even and stable IR radiation.
- Cooling fan stretch suspending design ensures good mechanical stability.
- Super wide sample compartment provides more flexibility to accommodate various accessories.
- The application of programmable gain amplifier, high accuracy A/D converter and embedded computer improves the accuracy and reliability of the whole system.

### Accessories:



- The spectrometer connects to PC via a USB port for automatic control and data communication, fully realizing plug-and-play operation.
- Compatible PC control with user friendly, rich function software enables easy, convenient and flexible operation. Spectrum collection, spectrum conversion, spectrum processing, spectrum analyzing, and spectrum output function etc. can be performed.
- Various special IR libraries are available for routine search. Users can also add and maintain the libraries or set up new libraries by themselves.
- Accessories such as Defused/Specular Reflection, ATR, Liquid cell, Gas cell, and IR microscope etc can be mounted in the sample compartment.

Model	FTIR510
<b>Spectral range</b>	7800 to 350 $\text{cm}^{-1}$
<b>Resolution</b>	Better than 0.85 $\text{cm}^{-1}$ (WQF-510A) Better than 0.85 $\text{cm}^{-1}$ (WQF-520A)
<b>Wavenumber precision</b>	$\pm 0.01 \text{ cm}^{-1}$
<b>Scanning speed</b>	5 step adjustable for different applications
<b>Signal to noise ratio</b>	Better than 15,000:1 (RMS value, at 2100 $\text{cm}^{-1}$ , resolution: 4 $\text{cm}^{-1}$ , detector: DTGS, 1min. data collection)
<b>Beam splitter</b>	Ge coated KBr
<b>Infrared source</b>	Air-cooled, high efficiency, reflex sphere module
<b>Detector</b>	DTGS
<b>Data system</b>	Compatible computer
<b>Software</b>	FT-IR software contains all routines needed for basic spectrometer operations, including library search, quantitation and spectrum export
<b>IR library</b>	11 IR libraries included
<b>Dimensions</b>	54x52x26cm
<b>Weight</b>	28kg

### Diffuse/Specular Reflectance Accessory

It is a versatile diffuse reflectance and specular reflectance accessory. Diffuse reflection mode is used for transparent and powder sample analysis. Specular reflection mode is for measuring smooth reflective surface and coating surface.

- High light throughput
- Easy operation, no internal adjustment needed
- Optical aberration compensation
- Small light spot, able to measure micro samples
- Variable angle of incidence
- Fast change of powder cup.

### Horizontal ATR /Variable Angle ATR (30° ~ 60°)

Horizontal ATR is suitable for the analysis of rubber, viscous liquid, large surface sample and pliable solids etc. Variable angle ATR is used for measurement of films, painting (coating) layers and gels etc.

- Easy installation and operation
- High light throughput
- Variable depth of IR penetration.



### IR Microscope

- Micro samples analysis, minimum sample size: 100 $\mu$ m (DTGS detector) and 20 $\mu$ m (MeT detector)
- Nondestructive sample analysis
- Translucent sample analysis
- Two measurement methods: transmission and reflection
- Easy sample preparation.

### Single Reflection ATR

It provides high throughput when measuring materials with high absorption, such as polymer, rubber, lacquer, fiber etc.

- High throughput
- Easy operation and high analytical efficiency
- ZnSe, Diamond, AMTIR, Ge and Si crystal plate can be selected according to application.

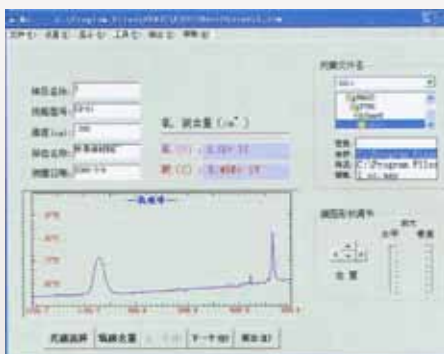


### Accessory for Determination of Hydroxyl in IR Quartz

- Fast, convenient and accurate measurement of Hydroxyl content in IR quartz
- Direct measurement to IR quartz tube, no need to cut samples
- Accuracy:  $\leq 1 \times 10^{-6}$  ( $\leq 1$ ppm).

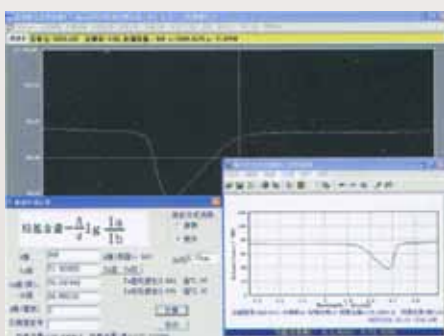
### Accessory for Oxygen and Carbon in Silicon Crystal Determination

- Special silicon plate holder
- Automatic, fast and accurate measurement of oxygen and carbon in silicon crystal
- Lower detection limit:  $1.0 \times 10^{16} \text{ cm}^{-3}$  (at room temperature)
- Silicon plate thickness: 4.0~0.4 mm.



### SiO<sub>2</sub> Powder Dust Monitoring Accessory

- Special SiO<sub>2</sub> powder dust monitoring software
- Fast and accurate measurement of SiO<sub>2</sub> powder dust.



### Component Testing Accessory

- Fast and accurate measurement of the response of such components as MCT, InSb and PbS etc.
- Curve, peak wavelength, stop wavelength and D\* etc can be presented.

### Optic Fiber testing Accessory

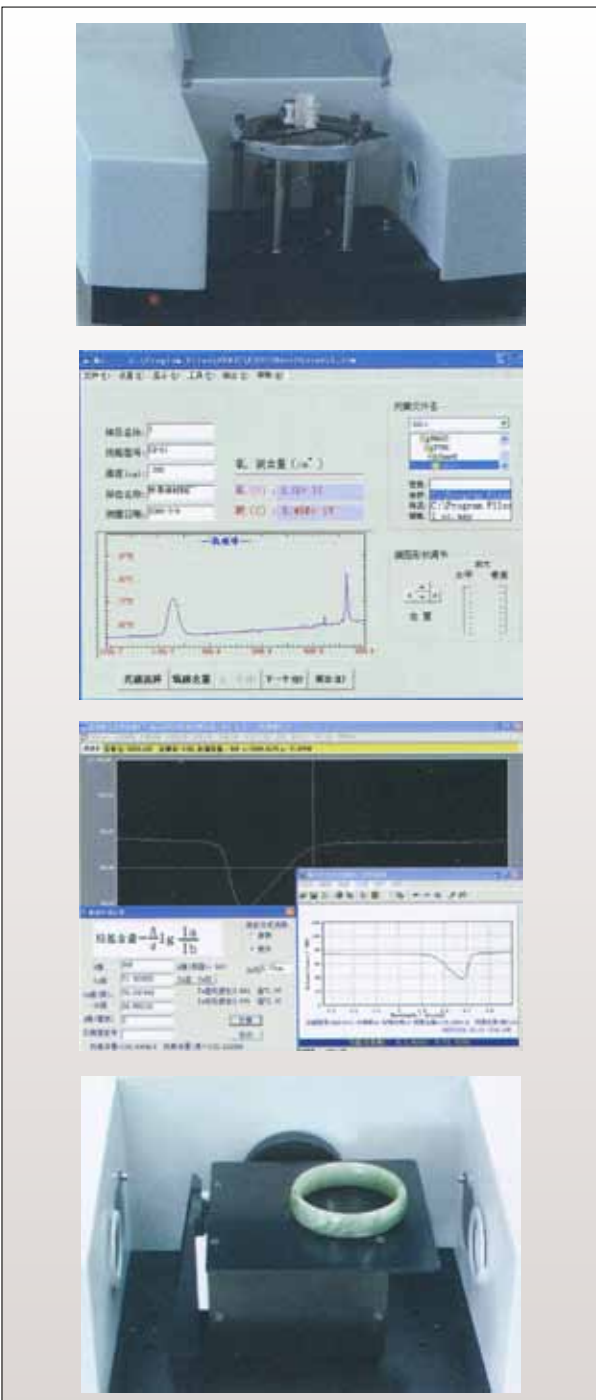
- Easy and accurate measurement of the loss rate of IR optic fiber, overcoming the difficulties for fiber testing, since they are very thin, with very small light-passing holes and uneasy to fix.

### Jewelry Inspection Accessory

- Accurate identification of jewelries.

### Universal Accessories

- Fixed liquid cells and demountable liquid cells
- Gas cells with different path length



## AAS-210, Atomic Absorption Spectrophotometer



### Features:

#### Innovated rich oxygen air-acetylene flame analysis technique:

The patented flame analysis technique adopting rich oxygen air-acetylene flame as the substitution for nitrous oxide-acetylene flame for high temperature element analyses, such as Ca, Al, Ba, W, Mo, Ti, V, etc. Flame temperature is continuously adjustable between 2300–2950°C, which makes it possible to choose the best atomization temperature for different elements. It features easy operation, low analysis cost and wide flame AAS analytical range. Rich oxygen flame will not pollute the environment and is not harmful to human bodies. It's a breakthrough in flame AAS analysis.

#### Integrated flame/graphite furnace atomization system, changeable with flame emission burner:

- Automatically controlled changeover of the integrated flame and graphite furnace atomizer featuring easy operation and time saving eliminates human labor.
- A flame emission burner head can be installed to perform flame emission analysis to alkali metals as K, Na etc.

#### Accurate fully automated control system:

- Automatic 6-lamp turret, automatic adjustment of lamp current and optimization of light beam position.
- Automatic wavelength scanning and peak picking.
- Automatic spectral bandwidth changing.
- Automatic changeover between flame and graphite furnace operation, automatic optimization of position parameters, automatic ignition and automatic gas flow setting.

#### Reliable fully automatic graphite furnace analysis:

- Adopting FUZZY-PID and dual curve mode light-controlled temperature control technique, temperature auto-correction technique, ensures fast heating, good temp. reproducibility & high analytical sensitivity. The temperature control accuracy is less than 1%.
- Graphite furnace with pneumatic control and pressure lock ensures constant pressure and reliable contact.

- Multi-function autosampler features automatic standard sample preparation, automatic correction of sampling probe depth, automatic tracing and correction of liquid surface height in the sample vessel, with the sampling accuracy of 1% and reproducibility of 0.3%, realizing fully automation of graphite furnace analysis.

#### Perfect safety protection measures:

- Alarm and automatic protection to fuel gas leakage, abnormal flow, insufficient air pressure and abnormal flame extinction in flame system.
- Alarm and protection function to insufficient carrier gas and protective gas pressure, insufficient cooling water supply and over-heating in graphite furnace system.

#### Advanced and reliable electronic design:

- Adopting large-scale programmable logic array and Inter I2C bus technology.
- European type sockets and AMP adapters with high reliability to ensure long term reliability of the whole electronic system.

#### Easy and practical analysis software:

- Easy-to-use MS analysis software is made under Windows operating system, realizing fast parameter setting and optimization.
- Automatic sample dilution, automatic curve fitting, automatic sensitivity correction.
- Automatic calculation of sample concentration (content), mean value, standard deviation and relative standard deviation calculation.
- Multi-elements determination in sequence to the same sample.
- Measured data and final results can be printed out and edited in Excel format.

#### Comparison:

Characteristic Mass of Some Elements using rich oxygen air-C<sub>2</sub>H<sub>2</sub> flame and other flame methods

Element	Wavelength (nm)	Rich oxygen air-C <sub>2</sub> H <sub>2</sub> flame	N <sub>2</sub> O-C <sub>2</sub> H <sub>2</sub> flame	Air-C <sub>2</sub> H <sub>2</sub> flame
Ca	422.7	0.009	0.05	0.07
Yb	378.8	0.037	0.08	7.6
Eu	459.4	0.137	0.3	3.0
Al	309.3	0.4	0.7	
Sr	460.7	0.016	0.1	0.15
Sa	553.5	0.1	0.4	10.0
Mo	313.3	0.15	0.4	0.8
W	255.1	3.2	5.0	
Ga	287.4	0.4	1.0	1.3
Sm	429.7	2.92	8.5	
La	550.1	37.2	35.0	
Sn	224.6	0.8	3.0	50

SPECIFICATIONS		
<b>Main Specification</b>	Wavelength range	190–900nm
	Wavelength accuracy	Better than $\pm 0.25\text{nm}$
	Resolution	Two spectral lines of Mn at 279.5nm and 279.8nm can be separated with the spectral bandwidth of 0.2nm and valley-peak energy ratio less than 30%.
	Baseline stability	0.004A/30min
	Background correction	The D2 lamp background correction capability at 1A is better than 30 times. The S-H background correction capability at 1.8A is better than 30 times.
<b>Light Source System</b>	Lamp turret	Motorized 6-lamp turret (Two high performance HCLs can be mounted on the turret to increase the sensitivity in flame analysis.)
	Lamp current adjustment	Wide pulse current: 0~25mA, Narrow pulse current: 0~10mA.
	Lamp power supply mode	400Hz square wave pulse; 100Hz narrow square wave pulse + 400Hz wide square wave pulse.
<b>Optical System</b>	Monochromator	Single beam, Czerny-Turner design grating monochromator
	Grating	1800 l/mm
	Focal length	277mm
	Blazed wavelength	250nm
	Spectral bandwidth	0.1 nm, 0.2nm, 0.4nm, 1.2nm, auto switch over
<b>Flame Atomizer</b>	Burner	10cm single slot all-titanium burner
	Spray chamber	Corrosion resistant all-plastic spray chamber.
	Nebulizer	High efficiency glass nebulizer with metal sleeve. sucking up rate: 6–7mL/min
	Emission burner provided	
<b>Graphite Furnace</b>	Temperature range	Room temperature–3000°C
	Heating rate	2000°C/s
	Graphite tube dimensions	28mm (L) x 8mm (OD)
	Characteristic mass	$\text{Cd} \leq 0.8 \times 10^{-12}\text{g}$ , $\text{Cu} \leq 5 \times 10^{-12}\text{g}$ , $\text{Mo} \leq 1 \times 10^{-11}\text{g}$
	Precision	$\text{Cd} \leq 3\%$ , $\text{Cu} \leq 3\%$ , $\text{Mo} \leq 4\%$
<b>Detection and Data Processing System</b>	Detector	R928 photomultiplier with high sensitivity and wide spectral range.
	Software	Under Windows operating system
	Analytical method	Working curve auto-fitting; standard addition method; automatic sensitivity correction; automatic calculation of concentration and content.
	Repeat times	1~99 times. automatic calculation of mean value, standard deviation and relative standard deviation
	Multi-task function	Sequential determination of multi-elements in the same sample.
	Condition reading	With model function
	Result printing	Measurement data and final analytical report printout, editing with Excel.
	Standard RS-232 serial port communication	
<b>Graphite Furnace Autosampler</b>	Sample tray capacity	55 sample vessels and 5 reagent vessels
	Vessel material	Polypropylene
	Vessel volume	3ml for sample vessel. 20ml for reagent vessel
	Minimum sampling volume	1 $\mu\text{l}$
	Repeatable sampling times	1~99 times
	Sampling system	Accurate dual pump system. with 100 $\mu\text{l}$ and 1 ml injectors.
<b>Characteristic Concentration and Detection Limit</b>	Air-C <sub>2</sub> H <sub>2</sub> flame Rich oxygen Air-C <sub>2</sub> H <sub>2</sub> flame	Cu: Characteristic concentration $\leq 0.025 \text{ mg/L}$ , Detection limit $\leq 0.006 \text{ mg/L}$ ; Ba: Characteristic concentration $\leq 0.22 \text{ mg/L}$ Al: Characteristic concentration $\leq 0.4 \text{ mg/L}$
<b>Function Expansion</b>	Hydridee vapor generator can be connected for Hydridee analysis.	
<b>Dimensions and Weight</b>	Main unit	107X49X58cm, 140kg
	Graphite furnace	42X42X46cm, 65kg
	Autosampler	40X29X29cm, 15kg

## AAS-110A/120A/130A, Flame/Graphite Furnace Atomic Absorption Spectrophotometer



### Features:

#### Innovated rich oxygen air-acetylene flame analysis technique (AAS-110A)

The patented flame analysis technique adopting rich oxygen air-acetylene flame as the substitution for nitrous oxide-acetylene flame for high temperature element analyses, such as Ca, Al, Ba, W, Mo, Ti, V, etc. Flame temperature is continuously adjustable between 2300-2950°C, which makes it possible to choose the best atomization temperature for different elements. It features easy operation, low analysis cost and wide flame AAS analytical range. Rich oxygen flame will not pollute the environment and is not harmful to human bodies. It's a break-through in flame AAS analysis.

#### Integrated flame/graphite furnace atomization system, changeable with flame emission burner

- Automatically controlled changeover of the integrated flame and graphite furnace atomizer featuring easy operation and time saving eliminates human labor.
- A flame emission burner head can be installed to perform flame emission analysis to Alkali metals as K, Na etc. (AAS-110N120A)

#### Accurate fully automated control system

- Automatic multi-lamp turret, automatic adjustment of lamp current and optimization of light beam position.
- Automatic wavelength scanning and peak picking
- Automatic spectral bandwidth changing

- Automatic changeover between flame and graphite furnace operation, automatic optimization of position parameters, and automatic ignition.

#### Reliable fully automatic graphite furnace analysis

- Adopting FUZZY-PID and dual curve mode light-controlled temperature control technique, temperature auto-correction technique, ensures fast heating, good temperature reproducibility and high analytical sensitivity. The temperature control accuracy is less than 1 %.
- Graphite furnace with pneumatic control and pressure lock ensures constant pressure and reliable contact.

#### Perfect safety protection measures

- Alarm and automatic protection to fuel gas leakage, abnormal flow, insufficient air pressure and abnormal flame extinction in flame system;
- Alarm and protection function to insufficient carrier gas and protective gas pressure, insufficient cooling water supply and over-heating in graphite furnace system.

#### Advanced and reliable electronic design

- Adopting large-scale programmable logic array and Inter 12C bus technology
- European type sockets and AMP adapters with high reliability to ensure long term reliability of the whole electronic system.

#### Easy and practical analysis software

- Easy-to-use AAS analysis software is made under Windows operating system, realizing fast parameter setting and optimization.
- Automatic display of measured data, automatic calculation and analytical result automatic print out.

SPECIFICATIONS		
<b>Main Specification</b>	Wavelength range	190–900nm
	Wavelength accuracy	±0.25nm
	Resolution	Two spectral lines of Mn at 279.5nm and 279.8nm can be separated with the spectral bandwidth of 0.2nm and valley-peak energy ratio less than 30%.
	Baseline stability	≤0.004A/30min
	Background correction	The D2 lamp background correction capability at 1A is better than 30 times. The S-H background correction capability at 1.8A is better than 30 times. ( only for AAS-110A/120A)
<b>Light Source System</b>	Lamp turret	6-lamp turret (AAS-110A/120A), 4-lamp turret (AAS-130A) Auto-alignment, fully automated scan and peak-picking.
	Lamp current adjustment	Automatic adjustment and display. Wide pulse current: 0~25mA, Narrow pulse current: 0~10mA
	Lamp power supply mode	400Hz square wave pulse; 100Hz narrow square wave pulse + 400Hz wide square wave pulse ( AAS-110A/120A )
<b>Optical System</b>	Monochromator	Single beam, Czerny-Turner design grating monochromator
	Grating	1800 l/mm
	Focal length	277mm
	Blazed wavelength	250nm
	Spectral bandwidth	0.1 nm, 0.2nm, 0.4nm, 1.2nm, automatic change.
<b>Flame Atomizer</b>	Burner	10cm single slot all-titanium burner
	Spray chamber	Corrosion resistant all-plastic spray chamber.
	Nebulizer	High efficiency glass nebulizer with metal sleeve. sucking up rate: 6–7mL/min
	Emission burner	Provided with AAS-110A/120A
<b>Graphite Furnace</b>	Temperature range	Room temperature–3000°C
	Heating rate	2000°C/s
	Graphite tube dimensions	28mm (L) x 8mm (OD)
	Characteristic mass	Cd≤0.8*10 <sup>-12</sup> g, Cu≤5*10 <sup>-12</sup> g, Mo≤1*10 <sup>-11</sup> g
	Precision	Cd≤3%, Cu≤3%, Mo≤4%
<b>Detection and Data Processing System</b>	Detector	R928 photomultiplier with high sensitivity and wide spectral range.
	Software	Windows operating system
	Analytical method	Working curve auto-fitting; standard addition method; automatic sensitivity correction; automatic calculation of concentration and content.
	Repeat times	Maximum 20 times of repeat measurement, automatic calculation of mean value, standard deviation and relative standard deviation.
	Multi-task function	Sequential measurement of multi-elements in one sample.
	Condition reading	With model function
	Result printing	Measurement data and final analytical report printout, editing with Excel.
	Standard RS-232 serial port communication	
<b>Characteristic Concentration and Detection Limit</b>	Normal Air-C <sub>2</sub> H <sub>2</sub> flame	Cu: Characteristic concentration ≤ 0.025 mg/L, Detection limit≤0.006mg/L;
	Rich oxygen Air-C <sub>2</sub> H <sub>2</sub> flame	Ba: Characteristic concentration ≤ 0.22mg/L Al: Characteristic concentration ≤ 0.4mg/L (for AAS-110A )
<b>Function Expansion</b>	Hydridee vapor generator can be connected for Hydridee analysis.	
<b>Dimensions and Weight</b>	1020 (L) x 490 (W) x 540 (H) mm (main unit), unpacked 80kg 420 (L) x 420 (W) x 460 (H) mm (graphite furnace), unpacked 50kg	

## AAS-110B/120B/130B, Flame Atomic Absorption Spectrophotometer



### Features:

#### Innovated rich oxygen air-acetylene flame analysis technique (AAS-110B)

The patented flame analysis technique adopting rich oxygen air-acetylene flame as the substitution for nitrous oxide-acetylene flame for high temperature element analyses, such as Ca, Al, Ba, W, Mo, Ti, V, etc. Flame temperature is continuously adjustable between 2300-2950°C, which makes it possible to choose the best atomization temperature for different elements. It features easy operation, low analysis cost and wide flame AAS analytical range. Rich oxygen flame will not pollute the environment and is not harmful to human bodies. It's a break-through in flame AAS analysis.

#### Flame atomization system with flame emission burner

A flame emission burner head can be installed to perform flame emission analysis to Alkali metals as K, Na etc. (AAS-110B/120B)

#### Accurate fully automated control system

- Automatic multi-lamp turret, automatic adjustment of lamp current and optimization of light beam position.
- Automatic wavelength scanning and peak picking
- Automatic spectral bandwidth changing
- Automatic ignition

#### Perfect safety protection measures

Alarm and automatic protection to fuel gas leakage, abnormal flow, insufficient air pressure and abnormal flame extinction in flame system;

#### Advanced and reliable electronic design

- Adopting large-scale programmable logic array and Inter 12C bus technology
- European type sockets and AMP adapters with high reliability to ensure long term reliability of the whole electronic system.

#### Easy and practical analysis software

- Easy-to-use AAS analysis software is made under Windows operating system, realizing fast parameter setting and optimization.
- Automatic display of measured data, automatic calculation and analytical result automatic print out.

### SPECIFICATIONS

SPECIFICATIONS		
<b>Main Specification</b>	Wavelength range	190-900nm
	Wavelength accuracy	±0.25nm
	Resolution	Two spectral lines of Mn at 279.5nm and 279.8nm can be separated with the spectral bandwidth of 0.2nm and valley-peak energy ratio less than 30%.
	Baseline stability	≤0.004A/30min
	Background correction	The D2 lamp background correction capability at 1A is better than 30 times. The S-H background correction capability at 1.8A is better than 30 times. (only for AAS-110B/120B)
<b>Light Source System</b>	Lamp turret	6-lamp turret (AAS-110B/120B), 4-lamp turret (AAS-130B) Auto-alignment, fully automated scan and peak-picking.
	Lamp current adjustment	Automatic adjustment and display. Wide pulse current: 0~25mA, Narrow pulse current: 0~10mA
	Lamp power supply mode	400Hz square wave pulse; 100Hz narrow square wave pulse + 400Hz wide square wave pulse ( AAS-110B/120B )
<b>Optical System</b>	Monochromator	Single beam, Czerny-Turner design grating monochromator
	Grating	1800 l/mm
	Focal length	277mm
	Blazed wavelength	250nm
	Spectral bandwidth	0.1 nm, 0.2nm, 0.4nm, 1.2nm, automatic change.
<b>Flame Atomizer</b>	Burner	10cm single slot all-titanium burner
	Spray chamber	Corrosion resistant all-plastic spray chamber.
	Nebulizer	High efficiency glass nebulizer with metal sleeve. sucking up rate: 6-7mL/min
	Emission burner	Provided with AAS-110A/120A
<b>Detection and Data Processing System</b>	Detector	R928 photomultiplier with high sensitivity and wide spectral range.
	Software	Windows operating system
	Analytical method	Working curve auto-fitting; standard addition method; automatic sensitivity correction; automatic calculation of concentration and content.
	Repeat times	Maximum 20 times of repeat measurement, automatic calculation of mean value, standard deviation and relative standard deviation.
	Multi-task function	Sequential measurement of multi-elements in one sample.
	Condition reading	With model function
	Result printing	Measurement data and final analytical report printout, editing with Excel.
		Standard RS-232 serial port communication
<b>Characteristic Concentration and Detection Limit</b>	Normal Air-C <sub>2</sub> H <sub>2</sub> flame	Cu: Characteristic concentration ≤ 0.025 mg/L, Detection limit≤0.006mg/L;
	Rich oxygen Air-C <sub>2</sub> H <sub>2</sub> flame	Ba: Characteristic concentration ≤ 0.22mg/L Al: Characteristic concentration ≤ 0.4mg/L (for AAS-110A)
<b>Function Expansion</b>	Hydridee vapor generator can be connected for Hydridee analysis.	
<b>Dimensions and Weight</b>	1020 (L) x 490 (W) x 540 (H) mm (main unit), unpacked 80kg	



## AAS-310/320, Flame Atomic Absorption Spectrophotometer



### Features:

#### High cost-effective flame AAS

Reasonable design, adopting the same key parts as in high end instruments, ensures basic functions but less automation to provide an economic model for users

#### Reliable integration of main unit with microprocessor

Built-in microprocessor with necessary auto-control and data processing functions achieve high reliability of the instrument.

#### Simple and easy operation

Eye-catching digital display, multi-function data processing ability and fast function-key direct input realize easy and fast analysis.

### SPECIFICATIONS

<b>Main Specification</b>	Wavelength range	190-900nm
	Wavelength accuracy	±0.5nm
	Resolution	Two spectral lines of Mn at 279.5nm and 279.8nm can be separated with the spectral bandwidth of 0.2nm and valley-peak energy ratio less than 30%.
	Baseline stability	0.005A/30min
	Background correction	The D2 lamp background correction capability at 1A is better than 30 times.
<b>Light Source System</b>	2 lamps are powered simultaneously ( one preheating )	
	Lamp current adjustment range: 0~20mA	
	Lamp power supply mode	Powered by 400Hz square pulse
<b>Optical System</b>	Monochromator	Single beam, Czerny-Turner design grating monochromator
	Grating	1800 l/mm
	Focal length	277mm
	Blazed wavelength	250nm
	Spectral bandwidth	0.1 nm, 0.2nm, 0.4nm, 1.2nm, 4 steps
	Adjustment	Manual adjustment for wavelength and slit
<b>Flame Atomizer</b>	Burner	10cm single slot all-titanium burner
	Spray chamber	Corrosion resistant all-plastic spray chamber.
	Nebulizer	High efficiency glass nebulizer with metal sleeve. sucking up rate: 6-7mL/min
	Position adjustment	Manual adjustment mechanism for vertical, horizontal positions and the rotation angle of the burner
	Gas line protection	Fuel gas leakage alarm
<b>Detection and Data Processing System</b>	Detector	R928 photomultiplier with high sensitivity and wide spectral range.
	Electronic and micro-computer system	Automatic adjustment of light source power. Light energy and negative high-voltage auto-balance.
	Display mode	LED display of energy and measurement value, concentration direct reading
	Read mode	Transient, time average, peak height, peak area. Integral time is selectable in the range of 0.1-19.9s.
	Scale expansion	0.1~99
	Data processing mode	Automatic calculation of mean, standard deviation and relative standard deviation. Repeating number is in the range of 1-99
	Measurement mode	Automatic curve fitting with 3~7 standards; Sensitivity auto-correction
	Result printing	Measurement data, working curve, signal profile and analytical conditions can all be printed out.
	Instrument self-check	Check current status of each function key
<b>Characteristic Concentration and Detection Limit</b>	Air-C <sub>2</sub> H <sub>2</sub> flame	Cu: Characteristic concentration ≤ 0.025 mg/L, Detection limit≤0.006mg/L;
<b>Function Expansion</b>	Hydridee vapor generator can be connected for Hydridee analysis.	
<b>Dimensions and Weight</b>	1020 (L) x 490 (W) x 540 (H) mm, 80kg unpacked	

## How to choose yours AAS configuration:

Model	O2-enriched flame*1	Flame emission	The number of HCL*2	Auto Alignment	HP-HCL*3	Background correction	Auto sampler	PC control	Flow rate control	Atomizer
AAS-210	Yes	Yes	6	Yes	Yes	S-H, D2	Yes	Yes	Automatic	Air-C2H2 Flame*4
										O2-enriched Flame*1
										Graphite Furnace*4
										Hydride Generation*5
AAS-110A	Yes	Yes	6	Yes	Yes	S-H, D2	No	Yes	Manual	Air-C2H2 Flame
										O2-enriched Flame
										Graphite Furnace
										Hydride Generation
AAS-120A	No	Yes	6	Yes	Yes	S-H, D2	No	Yes	Manual	Air-C2H2 Flame
										Graphite Furnace
										Hydride Generation
AAS-130A	No	No	4	Yes	No	D2	No	Yes	Manual	Air-C2H2 Flame
										Graphite Furnace
										Hydride Generation
AAS-110B	Yes	Yes	6	Yes	Yes	S-H, D2	No	Yes	Manual	Air-C2H2 Flame
										O2-enriched Flame
										Hydride Generation
AAS-120B	No	Yes	6	Yes	Yes	S-H, D2	No	Yes	Manual	Air-C2H2 Flame
										Hydride Generation
AAS-130B	No	No	4	Yes	No	D2	No	Yes	Manual	Air-C2H2 Flame
										Hydride Generation
AAS-320	No	No	4	No	No	D2	No	No	Manual	Air-C2H2 Flame
										Hydride Generation

Note:

**O2-enriched flame\*1** Our patented air-C2H02-2 flame (Substitution for N-20C2H2 flame)

**The number of HCL\*3** The number of HCLs could be loaded on the Turret

**High performance HCL\*3** Two high performance HCLs can be mounted on the turret to increase the sensitivity in flame analysis

Model	Atomizer	Elements
AAS-210	Air-C2H2 Flame*4	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	O2-enriched Flame*1	Be, Ca, Sr, Ba, Al, Ga, Si, Ge, Sn, Y, La, Sm, Eu, Yb, Ti, Zr, V, Cr, Mo, W
	Graphite Furnace*4	Ag, Al, Au, Be, Bi, Cd, Co, Cr, In, Mn, Mo, Ni, Pb, Pd, Sb, Se, Sn, Sr, Te, Tl, V
	Hydride Generation*5	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-110A	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	O2-enriched Flame	Be, Ca, Sr, Ba, Al, Ga, Si, Ge, Sn, Y, La, Sm, Eu, Yb, Ti, Zr, V, Cr, Mo, W
	Graphite Furnace	Ag, Al, Au, Be, Bi, Cd, Co, Cr, In, Mn, Mo, Ni, Pb, Pd, Sb, Se, Sn, Sr, Te, Tl, V
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-120A	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	Graphite Furnace	Ag, Al, Au, Be, Bi, Cd, Co, Cr, In, Mn, Mo, Ni, Pb, Pd, Sb, Se, Sn, Sr, Te, Tl, V
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-130A	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	Graphite Furnace	Ag, Al, Au, Be, Bi, Cd, Co, Cr, In, Mn, Mo, Ni, Pb, Pd, Sb, Se, Sn, Sr, Te, Tl, V
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-110B	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	O2-enriched Flame	Be, Ca, Sr, Ba, Al, Ga, Si, Ge, Sn, Y, La, Sm, Eu, Yb, Ti, Zr, V, Cr, Mo, W
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-120B	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-130B	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg
AAS-320	Air-C2H2 Flame	Ag, Au, Ba, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, In, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Pd, Pt, Rb, Rh, Sb, Sn, Sr, Te, Tl, Zn
	Hydride Generation	As, Se, Sb, Bi, Pb, Sn, Te, Ge, Hg

Note:

**Air-C2H2 Flame & Graphite Furnace \*4** This is integrative. automatically controlled changover of flame and graphite furnace atomizer.

**Hydride Generation\*5** This is a optional accessory



STER-100



STER-200



STER-220

**STER-Series, Gas Burners, 1300°C**

**Features:**

- Electronic instant ignition
- High temp. attainable: 1300°C
- Safety, clearing
- Adjustable flame
- Refillable butane fuel tank

**Applications:**

- Sterilizing
- Welding
- Heating
- Brazing
- Digestion
- Cooking

Model	STER-100	STER-200	STER-220
<b>Max. temperature</b>	1300°C	1300°C	1300°C
<b>Fuel capacity (g)</b>	45	45	45
<b>Working time (min)</b>	60	60	60
<b>Safety lock</b>	YES	-	-
<b>Dimensions (mm)</b>	H161xW137xD79	H92xW115xD79	H94xW115xD78
<b>Dry weight (g)</b>	380	407	425



STER-815

**STER-815/ STER-816, Bacti-Cinerator Sterilizer, 835°C**

The Bacti-Cinerator Sterilizer sterilizes microorganisms utilizing infrared heat produced by a ceramic core element. The ceramic element contains no asbestos and ensures maximum sterility without splatter across the work surface area. Complete sterilization occurs within 5-7 seconds at optimum sterilizing temperature of 1500°F (815.6°C). The small footprint makes the Bacti-Cinerator Sterilizer an ideal instrument for anaerobic and aerobic chambers alike.



STER-816

Model	STER-815	STER-816
<b>Central High-temperature</b>	825°C±50°C	
<b>Max-diameter of Sterilizer Goods</b>	Φ14mm	Φ35mm
<b>Length of Sterilizer</b>	150mm	100mm
<b>Dimension (mm)</b>	150×102×180	162×98×192
<b>Power</b>	170W	195W
<b>Weight</b>	1.3kg	1.4kg

**Heaters:**

- 300-07021-01 - 220V Heater for STER-815
- 300-07021-02 - 120V Heater for STER-815
- 300-07051-01 - 220V Heater for STER-816
- 300-07051-02 - 120V Heater for STER-816

**STER-817/ STER-818, Dry Glass Bead Sterilizer, 260°C**

Glass Bead Sterilizers are a quick, easy and accurate alternative to traditional methods of sterilization. Once switched 'ON', the units are ready to use within 15 minutes and ensure total sterilization by destruction of all Micro - Organisms within 10 seconds. Glass Bead Sterilizers are incorporated with an imported thermostat, which maintains the temperature with 240°C - 260°C. These units, having a stainless steel body, are compact enough to be placed on any air flow work benches or any other work side tables in a clean room atmosphere. Heated glass beads destroy all microbes and spores. Low power consumption allows for all day operation. Safe to use-no gases, fumes, open flames, or harsh liquids. Suitable for sterilizing scissors, forceps, scalpels, inoculating loops and needles.



STER-817

Model	STER-817	STER-818
<b>Crucible size</b>	40mm dia. 80mm Depth	40mm dia. 140mm Depth
<b>Preset Temperature Range</b>	240°C - 260°C	
<b>Initial Stabilization Time</b>	10 Minutes	10 Minutes
<b>Weight of Glass Bead</b>	40g	150g
<b>Material of Lid</b>	Stainless	

**STER-101, Boiling Water Sterilizer, 100°C**

**Specifications:** Timer: 0-60 min. mechanical timer with bell • Heater: 1500watts • Thermostat: Temp. over to 150°C auto cut-off power • Body material: 18.8 stainless steel • Tray DIM.: W350xD165xH30mm • Overall Dimension: W525xD190xH170mm • Net/Gross Weight: 3.5/4.0Kgs • Power Supply: 220V/50-60Hz/7Amp.

**Features:** All hydraulically pressed 18.8 stainless steel, can withstand electrolysis without corrosion • Long life immersion Stainless nickel pipe heater & corrosion proof • Precision mechanical timer with bell switch control • Waterless overheating prevention system with auto power cut-off • Build-in low level cut-off device.



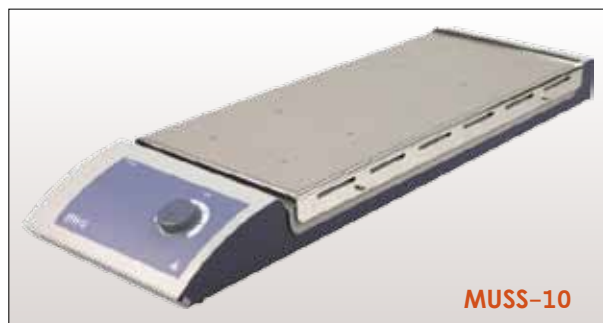
STER-101



MOS-135D

**MOS-135D, LED Digital Magnetic Stirrer, up to 3 Liter**

- Speed range of 100–1500 rpm
- Max. stirring quantity 3L
- LED display set and actual speeds
- Microprocessor control technology guarantees speed control accuracy
- ABS casing with fire retardant material, resistance of weak acid and alkali.



MUSS-10

**MUSS-10, 10-Channel, One Control for all Channels**

- One speed controller for all channels
- Speed range of 0–1 100rpm
- High-performance magnetic stirrer with 10 stirring positions benefit laboratory space
- Individually controlled stirring for consistency with various samples
- DC brushless motor maintenance free and provides constant speed
- Stainless steel plate with silicone film, anti-slip and anti-corrosion.

MUSH-10  
With Heating up to 120°C**MUSH-10, 10-Channel Magnetic Hotplate Stirrer**

- One speed controller for all channels
- Heating temperature up to 120°C
- High-performance multi-position magnetic stirrer with uniform temperature distribution
- Individually controlled stirring for consistency with various samples
- Electronic speed control motor provides constant speed
- DC brushless motor maintenance free and quiet running
- Stainless steel plate with silicone films, anti-slip and anti-corrosion.

120°C

Model	MOS-135D	MUSS-10	MUSH-10
Dimension of work plate (mm)	Ø135	180 x 450	180 x 450
Work plate material	Plastic	Stainless steel with silicone Film	Stainless steel with silicone Film
Motor type	DC motor	DC brushless motor	DC motor
Motor rating input (W)	5	12	12
Motor rating output (W)	3	4	4
Power (W)	15	20	490
Voltage (VAC)	100–240	200–240	200–240
Frequency (Hz)	50/60	50/60	50/60
Stirring positions	1	10	10
Max. stirring quantity (H <sub>2</sub> O), L	3	0.4 (each stirring position)	0.4 (each stirring position)
Max. magnetic bar(L x Ø) (mm)	50	40	40
Speed range (rpm)	100–1500	0–1100	0–1100
Speed display	LED	Scale	Scale
Heating temperature range (°C)	-	-	RT–120
Protection class according to DIN EN60529	IP42	IP42	IP42
Dimension (W x D x H) mm	150 x 260 x 80	182 x 552 x 65	182 x 552 x 65
Weight (kg)	1.8	3.2	3.2
Permissible ambient temp. (°C)	5–40	5–40	5–40
Permissible relative humidity	80%	80%	80%



**F-43**  
250x250mm  
Stirrer  
up to 30Liter

**F-33**  
175x175mm  
Stirrer  
up to 20Liter

**F-43D**  
250x250mm  
Stirrer  
up to 30Liter  
Digital Display

**F-33D**  
175x175mm  
Stirrer  
up to 20Liter  
Digital Display



**BIO-1, Bio Magnetic Stirrer**

- Cool running
- Electronic speed control up to 200 RPM
- Gear motor (without belt)
- Powerful drive magnet
- Net weight: 1 Kg
- Dimensions: (W x H x D) 12 x 10 x 13.5cm (D includes 1/2" dia. support rod clamp)
- 230V, 50Hz, 2.5 VA
- Option: 730 RPM.

**BIO-1**

**F-33 Power Large Volume Stirring, Up To 30Liter**

Magnetic stirrer 175 x 175 mm with a heavy duty brushless (non sparking) induction motor with condenser. Exclusive powerful magnet is especially designed for most efficient magnetic coupling. Stir up to 20 Liter water • Gentle or vigorous stirring • Integral ring-stand holder • Include rear bracket for support rod.

**Stirring Assembly:**

Electronic speed control provides constant torque over a speed range from 100 to 1200 RPM, regardless viscosity changes of the medium.

**Application:**

Stirring viscous gels • Stirring latex mixtures • Mixing polymers, starches & Molasses • Standard reagent mixing • Stir up to 4 Liters of aqueous solution • Aluminium top plate remains cool while stirring • For safe operation, all models include a power indicator light that illuminates when power is applied to the control • Quiet stirring at a gentle 100 rpm as well as at a vigorous 1000 rpm operation • Strong magnetic coupling ensures that stir bar remains coupled with drive magnet, even in viscous solutions.

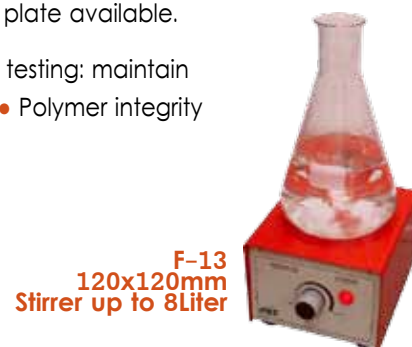
**F-43, Large Volume Stirrer**

The giant stirrer is similar to the above described Model F-33 but with a 25 x 25 cm. top plate. The giant size top plate easily accommodates stirring loads as large as 30 Liter water.

**F-13, Magnetic Stirrer Up To 8 Liter**

Powerful drive magnet • Strong motor-stirs up to 8 Liter water • Compact design maximizes use of available bench space • Variable speed control up to 1200rpm • Electronic speed control with "OFF" position • Available as 4-position stirrer, & 6-position stirrer • Powerful motor & strong magnet provide exceptional stirring even with a solution that has a viscosity similar to cooking oil • Durable, easy-to-clean, corrosion-resistant top plate available.

**Application:** Turbidity testing: maintain solution homogeneity • Polymer integrity tests/viscosity.



**F-13**  
120x120mm  
Stirrer up to 8Liter

Model	Top plate	Capacity	Speed range	Dimensions (WxHxD)	Weight
<b>F-13</b>	120x120 mm	8 Liter	100 to 1200 rpm	120x100x135 mm	1.2 kg
<b>F-33</b>	175x175 mm	20 Liter	100 to 1400 rpm	200x150x260 mm	3.2 kg
<b>F-43</b>	250x250 mm	30 Liter	100 to 1400 rpm	250x150x260 mm	4.2 kg



### F-13/2/3/4/6/2x2/3x2, Multi-Magnetic Stirrer, Separate Speed Controller For Each Channel

The Multi-magnetic Stirrer provides 2,3,4 or 6 stirring places. Separate stirrer control knobs & pilot lamps are provided, so that each stirrer can be independently controlled. 220V/50Hz. (On request 115 V/60Hz).



F-13/4



F-13/3x2

#### Dimensions:

**Model F-13/2,**  
2 plates: W300xD146xH80

**Model F-13/3,**  
3 plates: W450xD146xH80

**Model F-13/4,**  
4 plates: W600xD146xH80

**Model F-13/6,**  
6 plates: W800xD146xH120

**Model F-13/3x2,**  
2x3 plates: W450xD300xH120

**Model F-13/2x2,** 2x2 plates: W300xD300xH80



F-13/2x2

Model	F-13/4	F-13/6	F-13/3x2	F-13/2x2
Speed range	0~1300 rpm			
Distance between stirring point	133 mm		150 mm	
Capacity	One point maximum - 8L			
	2-6 Liter each			
Material	Plate: Aluminium			
Weight	5kg	7.5kg		5kg
Dimensions (mm)	W600xD146xH80	W800xD146xH120	W450xD300xH120	W300xD300xH80
VA	80VA	120VA		80VA
Power	AC110/220/230V, 50/60Hz			
Unit	F-13/4 / F-13/2x2		4 Point magnetic stirrer	
	F-13/6 / F-13/3x2		6 point magnetic stirrer	



MOS-120

### MOS-120, Economy Magnetic Stirrer With Clamp, up to 1 Liter

- for holding ph electrode & temperature probe.
- Used for stirring while adjusting pH of solutions.

#### Features:

- Low cost, Lightweight & Compact
- Designed in a special round shape by ABS housings to resist most harmful chemicals
- The speed can be adjusted between 0 to 2300rpm
- Suitable for mixing thin fluid media up to 1000ml
- The Clamp can be adjusted height easily for holding PH electrode or temperature probe.

## SI-0301 Magstir Genie, SI-3001 MultiMagstir Genie, Programmable High/Low Speed Stirring



SI-0301

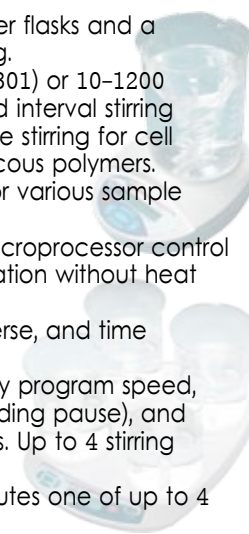
SI-3001

**Features:**

- Magstir Genie (SI-0301) may be used with any regular flask/beaker or spinner flask and a max. sample weight of 5.0 kg.
- MultiMagStir Genie (SI-3001) may be used with up

to 4 1L flasks/beakers or 3 1L spinner flasks and a maximum sample weight of 10.0 kg.

- Speed range of 10–1800 RPM (SI-0301) or 10–1200 RMP (SI-3001) including reverse and interval stirring for applications ranging from gentle stirring for cell culture to aggressive mixing for viscous polymers.
- Three power levels are available for various sample viscosities.
- Low-profile magnetic stirrer uses microprocessor control for precise and reproducible operation without heat build-up from internal friction.
- Manual mode provides stir, stir reverse, and time functions.
- Profiles mode allows users to quickly program speed, ramp rate, stir direction, time (including pause), and power level in up to 9 distinct steps. Up to 4 stirring programs can be saved.
- Automatic mode recalls and executes one of up to 4 user-defined profiles.



Model	SI-0301	SI-3001
<b>Stirring Speed</b>	10–1800 RPM	10–1200 RPM
<b>Time</b>	1 second – 99 hours	1 second – 99 hours
<b>Programmable</b>	Yes	Yes
<b>Power Levels</b>	Low, Medium, High	Low, Medium, High
<b>Selectable Ramp Rates</b>	5 – 300 rpm/sec	5 – 300 rpm/sec
<b>Memory</b>	Up to 4 user-defined profiles	Up to 4 user-defined profiles
<b>Maximum Stirring Positions</b>	1	4
<b>Maximum Stirring Capacity</b>	2L (larger for low speed stirring)	1L each position (larger for low speed stirring)
<b>Dimensions (D x W x H)</b>	200 x 160 x 55mm	375 x 325 x 48 mm
<b>Weight</b>	1.0 kg	3.2 kg
<b>Markings</b>	ETL/CE	

## SI-2246 Analog, SI-3246 Digital, SI-3246L Low-Speed, Large Volume Magnetic Stirrers, up to 38Liter



SI-2246

SI-3246

SI-3246L

**Features:**

- Powerful magnet and motor offer exceptional magnetic force capable of stirring up to 38L.
- True speed digital feedback version is available. Analog version features speed dial.
- Low speed digital version also available (SI-2246 – 50–300 RPM).
- Feedback control on digital version of the Magnet Stirrer is adjustable in 10 RPM increments.
- LED display is offered on digital version for easier speed and time readings.
- Rugged ABS/Polycarbonate housing and the famous Vortex-Genie® heavy-duty motor.
- Spill-resistant housing channels fluids away from the internal components.
- Ramping feature slowly increases speed to avoid splashing and improve spin bar control.
- May be used in cold rooms and incubators.

Model	SI-2246	SI-3246	SI-3246L
<b>Speed</b>	250–1300 RMP	250–1300 RMP	50–300 RMP (285 for 50Hz Models)
<b>Timer</b>	N/A	1 – 99 min or continuous	1 – 99 min or continuous
<b>Maximum Stirring Positions</b>	1	1	1
<b>Maximum Stirring Capacity</b>	38L	38L	38L
<b>Top Surface Dimensions (DxW)</b>	305 x 305 mm	305 x 305 mm	305 x 305 mm
<b>Overall Dimensions (D x W x H)</b>	310 x 305 x 130 mm	310 x 305 x 130 mm	310 x 305 x 130 mm
<b>Weight</b>	3 kg	3 kg	3 kg
<b>Markings</b>	CE		

## SI-4246, SI-5246, 4 Position Magnetic Stirrers



SI-4246

SI-5246

- Powerful magnet and motor offer exceptional magnetic force capable of stirring up to 2L for each position.
- True speed digital feedback version is available. High Speed Analog version features speed dial for high speed applications.
- Rugged ABS/Polycarbonate housing and the famous Vortex-Genie® heavy-duty motor provide years of reliable service.
- LED display is offered on digital version for easier speed and time readings.
- Spill-resistant housing channels fluids away from the internal components.
- Ramping feature for digital model slowly increases speed to avoid splashing and improve spin bar control.
- Can be used in cold rooms and incubators.

Model	SI-4246	SI-5246
Speed	250-1300 RPM	250-1300 RPM (controllable)
Timer	N/A	1-99 min or continuous
Maximum Stirring Positions	4	4
Maximum Stirring Capacity	2 Liters Each Position (Simultaneous)	2 Liters Each Position (Simultaneous)
Top Surface Dimensions (DxW)	305 x 305mm	305 x 305mm
Overall Dimensions (DxW)	310 x 305 x 130mm	310 x 305 x 130mm
Weight	3 kg	3 kg
Markings	CE	

## MUS-5/10, Multi-Magnetic Stirrer, one Speed Controller For Every Five Channels



MUS-5

MUS-10



MUS-5

MUS-10

## Low profile - High performance

- Multi-position magnetic stirrers, without heating
- High quality permanent DC brushless motor for quiet and powerful stirring
- Variable speed control between 0 to 1,300rpm
- Stainless steel top plate for the protection against the penetration of liquids
- Stable low profile body for convenient and safe experiment.

Model	MUS-5	MUS-10
Speed range	0-1300 rpm	
Distance between stirring point	90 mm	
Capacity	One point maximum - 2L	
	250ml - 5ea	250ml - 10ea
Material	Plate: Stainless steel	
Weight	3kg	5kg
Dimensions (mm)	W114xD564xH63	W197xD564XH63
Wattage	15W	30W
Power	AC110/220/230V, 50/60Hz	
Unit	ST-5	5 Point magnetic stirrer
	ST-10	10 point magnetic stirrer





PCR-300

**PCR-300, Polymerase Chain Reaction**

**Features:**

- Adjustable pressure hot lid, to prevent volatilizing & dewing
- Hot lid with pressure alarm device, to prevent damaging test tube by too much pressure
- Convenient & flexible module replacement mode.
- Innovative module wire socket design achieves module replacement without wire
- The unique left-right design for amplification area & operating area makes operator more convenient & safe.

Model	PCR-300
Capacity	64x0.2ml, 36x0.5ml
Temp. range	4°C-99°C
Maximum Heating rate	≥2.5°C/s
Uniformity	95°C <sub>h</sub> ≤±0.5°C (20 seconds later) 20°C~72°C <sub>h</sub> ≤±0.3°C (20 sec. later)
Maximum Cooling rate	≥2.5°C/s
Temp. display Accuracy	0.1°C
Accuracy	≤±0.2°C
Temperature fluctuation	≤±0.1°C
Heated lid temp.	105°C
Stored program no.	100
Max. program unit	9
Max. cycle steps	9
Max. no. of cycle	99
Max. constant temp. time	59m 59s
Max. constant temp. preservation time	99h 59m
Display	4.0" LCD
Size (mm)	370x249x180
Weight	4.8kg



PCR-400

**PCR-400, Gradient Thermal Cycler**

**Features:**

- Convenient and flexible module replacement mode.
- Large size super-high-definition LCD screen.
- Intuitive, friendly user interface makes program easier and faster.
- Memory function in case of power-down.
- Low noise, low energy consumption, long application life.
- Solemn, elegant appearance, innovative model.
- Unique rotating stall heat-regulating function.
- Optimal panel design for human ,more convenient operation.
- Hot lid could be stopped at any angle.
- Handle-module, more secure and convenient module replacement, improving using efficiency and expanding using years.

Model	PCR-400
Capacity	96x0.2ml, 54x0.5ml, 96x0.2ml+77x0.5ml, 384well
Temp. range	0°C-99°C (Rt≤30°C)
Maximum Heating rate	≥4.0°C/s
Heating/cooling rate	1.0°C/s-4°C/s (Adjustable)
Uniformity	≤±0.3°C (95°C) ≤0.2°C (20-75°C)
Maximum Cooling rate	≥3.5°C/s
Accuracy	≤±0.2°C
Gradient temp range	30~99°C
Gradient spread	2~30°C
Gradient Uniformity	≤0.2°C
Heated lid temp.	30~115°C
Environment model	Manually select
Temp control	block, tube, calculated
Stored program no.	200
Max. no. of cycle	99
Display	5.7" LCD
Communication	USB2.0, Rs232
Size (mm)	380(L) x 270(M) x 250(H)
Weight	7.2kg



**Instrument working condition:**

- Ambient temperature: 5°C-30°C
- Relative humidity: <90%
- Power supply: AC110V±22V, 220V±22V, 250VA, 50Hz±10Hz.

**Instrument storage condition:**

- Ambient temperature: -20°C-55°C
- Relative humidity: <90%.



**PCRSG-500**

## PCRSG-500, Smart Gradient PCR

- Features:** Convenient and flexible module replacement mode • Sealed sample design for low temperature preservation, clean and dry • Two-stage hot lid pressure regulator, ensures good sealing performance • Gold-plated or silver-plated module, improves the efficiency of heat conduction, makes the experiment more effective • Large size and color super-high-definition LCD screen • Intuitive and user-friendly interface, makes programming quick and easy • Infinitely adjustable lid knob, suitable for various types of the tube • Memory function in case of power-down • Low noise, low energy consumption, long application life • Hot lid could be stopped at any angle • Metal material lid, more reliable and safe • Hard disk and mouse can be linked • Linked with PC for its multiple control • Windows operating system.
- Convenient, free-charge program upgraded.
  - Long distance trouble judgment.
  - Achieve Circulation nesting.
  - 110-220v international general voltage.



### Reliable guarantee for the accuracy of the temperature

Temperate extended control mode which is closer to required experiment temperature control and is able to effectively avoid the system error caused by the disaccord of the temperature points among the instrument's display temperature, actual block temp. and the temperature required for reagents. So as to improve the accuracy of the experiment and ensure the high efficiency. Strict temperature control debugging program makes sure that each instrument can meet the needs of different experiment. 12 channel temp. probes detect simultaneously, which ensure the homogeneity of sample temp. The hermetic-space technique can efficiently eliminate PCR margin reaction. The technique of outside temperature probe tracing the inside curve testing can effectively ensure the accuracy of sample temperature.

Model	PCRSG-500
<b>Capacity</b>	96x0.2mL(A) ,54x0.5mL(B), 96x0.2mL+77x0.5mL(C), 384well(D)
<b>Temp range</b>	0°C-99°C (Rt≤30°C)
<b>Max. Heating rate</b>	≥ 4.5°C/s
<b>Max. Cooling rate</b>	≥ 4°C/s
<b>Heating / Cooling rate</b>	0.1°C/s ~ 4°C/s (Adjustable)
<b>Uniformity</b>	≤ ±0.2°C (After 10s)
<b>Accuracy</b>	≤ ±0.1°C
<b>Gradient temp rang</b>	30~99°C
<b>Gradient spread</b>	1~30°C
<b>Hot lid temp</b>	20~110°C
<b>Environment model</b>	automatic identification
<b>Temp control</b>	block, tube (10~100µl can be used), calculated
<b>Stored program</b>	1000
<b>Max. no. of cycle</b>	999
<b>Display</b>	5.7"LCD
<b>Communication</b>	USB2.0, Rs232, RJ45, LAN
<b>Size (mm)</b>	380mm(L)x270mm(M)x250mm(H)
<b>Weight</b>	7.8kg



**PCR-200**

## PCR-200, Mini PCR

- Features:** Small-sized and easy to program with intuitive user interface • The lid adopts the high temperature resistant material and applicable to various types of test tube • Memory function in case of power-down • Two control mode: PCR or control through PC operation software • It is benefit for students to understand with the animation presentation capabilities of the PC operating software • Achieve Circulation nesting.

Model	PCR-200
<b>Capacity</b>	25x0.2mL(A), 9x0.5mL(B), 16x0.2mL+9x0.5mL(C).
<b>Temp range</b>	0°C~99.9°C(Rt≤30°C)
<b>Max. Heating rate</b>	≥2°C/s
<b>Max. Cooling rate</b>	≥2°C/s
<b>Uniformity</b>	≤ ±0.3°C(constant 20s)
<b>Accuracy</b>	±0.2°C
<b>Temp control</b>	block
<b>Stored program</b>	3
<b>Max. no. of cycle</b>	99
<b>Display</b>	12864LCD
<b>Communication</b>	Serial Port
<b>Size (mm)</b>	160mm(L)x140mm(M)x120mm(H)
<b>Weight</b>	2.2kg

**DG-600, Personal Ultrasonic Cleaner (without heating)**



DG-600

Model	DG-600
Operating frequency	43 KHz
Tank Capacity	600 ml
Internal tank size (mm)	L170xW90xH55
External DIM. (mm)	L193xW113xH110
Internal tank stuff	SUS304 # 0.7t
External stuff	ABS with fireproof
Dust cover stuff	Semi transparent plastic
Timer	5 min
Ultrasonic power	50W
Heating Power	Without
Net weight	1 kg
Power source	AC100~120V/AC220V 50/60Hz

**DG-1300, Personal Ultrasonic Cleaner (with heating)**



DG-1300

Model	DG-1300
Operating frequency	42 KHz
Tank Capacity	1,300 ml
Internal tank size (mm)	L175xW145xH70
External DIM. (mm)	L228xW183xH158
Internal tank stuff	Stainless steel SUS304
External stuff	ABS with fireproof
Dust cover stuff	Semi transparent plastic
Time Control	5 Cycles with Digital time display
Ultrasonic power	60W
Heating Power	60°C
Net weight	1.75 kg
Power source	AC 110-120V 60Hz AC 220-240V 50/60 Hz

**Features:**

- High-power ultrasonic transducer for superior cleaning effect.
- Large capacity tank for professional cleaning.
- Heating for special cleaning demands.
- 3-59 minutes timer with digital display.
- 5 Cycles timer with digital display.
- Memory function for the power failure.
- Transparent lid with blue light for view the cleaning process.
- With radiator for longer working time.
- Secure circuitry design with moisture-proof PCBA.

Electron workshop, Glasses shop, Jewelry shop, Mobile phone, maintain shop, Hospital Dentistry, Office and household articles etc.

**CLEAN-01/02, 5/10Liter Ultrasonic Cleaners (Dental)**



CLEAN-01

- Cycle time set: 2-30 minutes.
- Temp set: 20-80°C.
- Safety feature: Heating stops when tank is empty.
- Water outlet is installed to drain liquid from the tank easily.
- Low noise fits clinical environment.
- Cleaning basket holds delicate instruments in place.
- Keypads & digital display are user friendly.
- Rinse time can be set from 2 to 30 min, rinse temperature can also be set. Power is automatically cut off when is lack of water.
- External drainage system makes easy change of rinse liquid; Low noise design makes quiet operation.
- Specialized basket is designed for delicate minute devices that should be free from friction and braise, for example, high-speed and low-speed hand piece turbines
- Clear operation plate with digital display makes it easy to operate.

Model	CLEAN01	CLEAN02
Operating frequency	40 KHz	
Tank Capacity	5L	10L
Internal/ External tank size (mm)	229.5x126.5x149 / 315x215x270	295x235x149 / 385x325x285
Ultrasonic / Heating power	120W / 100W	240W / 300W

Ultrasonic Cleaner is on based of Cavitation effect caused by high frequency ultrasonic wave vibration signal in fluid.

Microscopic bubbles are formed and they implode violently that cause Cavitation, which gives out great impact to the cleaning subject and provides an intense scrubbing action on the surface of cleaning subject. Additionally, the bubbles are small enough to penetrate even microscopic crevices, cleaning them thoroughly and consistently.

### Cleaning Applications:

Air brushes, spray guns • Archival papers • Automotive & aviation components • Calligraphic pens • Computer plotter pens • Dental and surgical instruments • Dentist burs • Dentures • Films • Fuel injectors • Geological & metallurgical specimens • Homogenizations • Hypodermic needles • Ink jet cartridges • Jewelry • Laboratory glassware and apparatus • Laparoscope • Lenses, other optical components • Metal/fibre filters • Metal/rubber seals • Microelectronic circuits & small components • Moulding die • Nozzles & Sieves • Printed circuit boards • Production line cleaning • Scientific & industrial instruments • Spectacle frames • Transparencies • Watches & clockwork. • Electron workshop, Glasses shop, Jewelry shop, Mobile phone, maintain shop, Hospital Dentistry, Office & household articles etc.



### AC-Analog Series

Ultrasonic cleaner-set with analog timer & temperature controller, with wire basket & lid, highly effective & efficient cleaning, stainless steel, up to 80°C, 0~20min, 40kHz frequency  
Made of stainless steel, finished surface.

Analog controller, timer, temperature and output control

### Features:

- Useful for Cleaning and Removing Dirt, Grease, Waxes and Oil from all Lab Instruments by Ultrasonic Frequency.
- Made of Stainless Steel, Finished Surface.
- Analog Controller, Timer, Temperature and Output Control.
- Temperature Range from Ambient to 80°C.

- Convenient Preset Function: Heating and Timer • Frequency: 40kHz • Bottom-Mounted Drain (except AC-120H) • Maximum 20 minutes Set Cleaning Time • 220V, 50/60Hz • Include basket & lid.

Model	AC-120H	AC-150H	AC-200H	AC-250H	AC-300H	AC-400H
Operating Frequency	40Khz	40Khz	40Khz	40Khz	40Khz	40Khz
Tank capacity (Liters)	3	6	9	13	20	27
Internal tank size(mm)	L240xW140xH100	L300xW155xH150	L300xW240xH150	L330xW300xH150	L500xW300xH150	L500xW300xH200
External DIM.(mm)	L270xW170xH240	L330xW180xH310	L330xW270xH310	L360xW330xH310	L550xW330xH310	L550xW330xH360
Internal tank stuff	SUS 304 #1.0t					
External stuff	Steel plate toast paint					
LID cover stuff	Stainless steel SUS 304					
Timer	1-20 min					
Ultrasonic power	100W	150W	200W	300W	400W	500W
Heating Power	100W	300W	300W	400W	500W	500W
Net Weight	3.2Kg	6.2Kg	8.2Kg	10.2Kg	13.2Kg	14.9Kg
Drainage	None	Have				
Power source	AC100~120V/AC220~230V 50/60Hz					

**For intensive cleaning, degassing emulsifying, homogenization, & the acceleration of chemical processes in the research, production, and maintenance sectors.**

**Principle**

The clean function of ultrasonic wave is to use the waves over the frequency of human hearing conducting within the liquid. When ultrasonic waves, longitudinal waves, are conducting within the cleaner, which pushing function for the medium will enable the pressure within the liquid to change and produce mini vacuum bubbles referred as Cavitation. When gas bubbles are pressed to break, they will produce so great excitation energy as to separate the dirties stacked to the dead corner of object as well as to enhance clean effect of cleaner. With high frequency, short wave length and strong penetrating power, so that it can completely clean the article having hidden seam or complex structure.

<b>Laboratories</b>	Cleaning, degassing, homogenizing, emulsifying,
<b>Medicine</b>	Cleaning surgical instrument, manufacture of implants and stents
<b>Dental</b>	Cleaning instruments for dental treatment, cleaning dental prostheses
<b>Optics</b>	Cleaning spectacles, optical lenses before coating etc.
<b>Jewelry &amp; watches</b>	Cleaning chains, rings, straps etc.
<b>Chemical sector</b>	Cleaning reactors, acceleration of chemical reactions etc.
<b>Plastics industry</b>	Cleaning injection moulds etc.
<b>Aircraft industry</b>	Cleaning engine parts etc.



**DC-Power Full Series**

**Digital Ultrasonic Cleaner-set, with Wire Basket & Lid, Highly Effective & Efficient Cleaning, Stainless Steel, up to 70°C ,0-99min., Frequency 40KHz**

- Useful for Cleaning to Remove Dirt, Grease, Waxes and Oil from all Lab instruments by Ultrasonic Frequency.
- Microprocessor Control: Timer, Temperature and Output Control.
- Frequency: up to 40kHz.
- Temperature Range from Ambient to 70°C.
- Convenient Pre-set Function: Heating and Timer.
- Bottom - Mounted Drain (Except DC-80H).
- Maximum 99 minutes Set Cleaning Time.
- Include Basket & Lid.

Model	DC-80H	DC-120H	DC-150H	DC-200H	DC-250H	DC-300H	DC-400H
<b>Operating frequency</b>	40 KHz						
<b>Tank Capacity (Liters)</b>	2	3	6	9	13	20	27
<b>Internal tank size (LxWxH) (mm)</b>	150x140x100	240x140x100	300x155x150	300x240x150	330x300x150	500x300x150	500x300x200
<b>External dimension (LxWxH) (mm)</b>	190x170x220	270x170x240	330x180x310	330x270x310	360x330x310	550x330x310	550x330x360
<b>Internal tank stuff</b>	SUS 304 #1.0t						
<b>External stuff</b>	Steel plate toast paint						
<b>LID cover stuff</b>	Stainless steel SUS 304						
<b>Timer</b>	1-99min						
<b>Ultrasonic power</b>	50W	100W	150W	200W	300W	400W	500W
<b>Heating Power</b>	100W	100W	300W	300W	400W	500W	500W
<b>Net weight</b>	1.9kg	2.9kg	5.8kg	8.8kg	10.2kg	13.2kg	14.9kg
<b>Drainage</b>	-	-	Have				
<b>Power source</b>	AC100~120V/AC220~240V 50/60Hz						

## SONICA-36/90/57/112/145/235L, Industrial Ultrasonic Water Bath Cleaners



**SONICA-36L**



**SONICA-90L**


### Features:

- Whole machine made of SUS304 stainless steel for acid-proof, anti-corrosive, 2mm thickness.
- Industrial grade ultrasonic transducer, moisture-proofed PCB
- Temperature can be set from 30-110°C
- Industrial grade for 24 hours continuous working
- Advanced generator, sweep frequency, high quality, better effect
- Ultrasonic frequency: 28Khz (optional: 40, 68, 80 or 120Khz)
- Material: Stainless steel with diamond-shaped figures. (Tank, Housing, Basket, Lid)
- High-performance transducer, steady & durable performance
- Secure and stable PCBA
- Ultrasonic power can be adjusted from 0-100%.

### Applications:

Industry Ultrasonic Cleaner can be used in industry & mining enterprise, universities, colleges and scientific research unit laboratory; Hospital; Electronic workshop assembly line; Clock and watch eyeglasses shop, jewelry; Jeweler's shop, Electronic products, mechanical hardware fitting, eyeglasses, jewelry, clock and watch, money, fruit and so on.

The Industry Ultrasonic can also be used in household, to clean personal articles such as gold and silver jewelry, necklaces, earrings, glasses and nozzles.



**CAV-METER-2, Cavitation Intensity Meter**

Our Ultrasonic Cleaning Cavitation Intensity Meter instantly measures ultrasonic energy (cavitation) directly in ultrasonic cleaning tanks. It is used to measure ultrasonic energy simply by dipping the cavitation meter probe into an ultrasonic tank. It is very rugged and built to last a lifetime. The solid stainless steel probe can be used in any harsh chemical and extreme environments.

Model	SONICA-36L	SONICA-90L	SONICA-57L	SONICA-112L	SONICA-145L	SONICA-235L
Operating frequency	28KHz (optional: 40/68/80/120KHz)					
Tank Capacity (Liters)	36	90	57	112	145	235
Internal tank size (LxWxH) (mm)	510x300x250	590x400x400	470x340x360	600x470x400	650x500x450	650x600x600
External dimension (LxWxH) (mm)	700x400x500	790x580x650	635x470x580	790x650x650	850x660x730	850x800x880
Internal tank stuff	SUS 304 #1.0t					
External stuff	Steel plate paint coated					
LID cover stuff	Stainless steel SUS 304					
Ultrasonic power	720W	1440W	1080W	1800W	2160W	2520W
Heating Power	500W	1200W	3000W	4000W	6000W	6000W
Net weight	23kg	89kg	45kg	81kg	117kg	190kg
Drainage	Have					
Power source	AC100~120V/AC220~240V 50/60Hz					



**SONIC Series, Ultrasonic Cell Disrupter Homogenizer:**

It is also called Ultrasonic homogenizer, processor or disrupter. A Sonicator system is comprised of 3 major components: Generator, Converter and Horn (also known as a probe). The new model of the SONIC features: Series is integrated with Temperature Monitor optional. LCD display screen clearly displays all operating parameters and options: Temperature,time,output power etc. Temperature monitor to protect sample from overheating.

**Features:**

**Full amplitude control:** Amplitude (intensity) can be set from 1-100% giving a greater degree of resolution and the ability to pinpoint the amplitude needed to effectively process your sample.

**Programmability:** Parameters including processing time, pulse on/off and power output ,it can be saved to memory and run by the touch of a button. This new system can store more than 50 custom programs.

**Pulse mode:** Adjustable pulse On and Off times to reduce the heat gain in temperature sensitive samples.

**Auto tuning:** The Sonicator digitally tracks frequency changes in the converter/ tip assembly caused by load and temperature changes and maintain electrical efficiency at all times. Manual tuning is unnecessary.

**Temperature monitoring:** An optional temperature probe is available for those customers who wish to monitor the temperature of their sample. If the temperature limits reached, sonication shuts down to prevent overheating.

**Applications:**

**Biological / Biotech:** Sonication is an ideal tool for lysing bacteria, yeast and tissue cells for the extraction of protein, DNA, RNA, and cellular components. DNA shearing (ChIP Assay) is a very common application.

**Pharmaceutical:** Cell disruption is common in analytical, quality control, and R & D labs to perform numerous functions from mixing and degassing of analytical samples, to cracking open tablets for dissolution tests. Liposomes and emulsions are easily formed by Sonication for microencapsulation purposes in the production of creams and lotions.

**Chemical:**

Sonication accelerates both physical and chemical reactions.,Major advances in sonochemistry include chemical synthesis of catalysts and new alloys, catalyzing organometallic reactions, micro-encapsulation of protein and hydrolyzing esters. The use of sonication provides greater yields, increases overall efficiency, and saves energy.

**Industrial:**

Industrial uses include forming emulsions, catalyzing reactions, extracting compounds, and reducing particle size. Continuous.

**Environmental:**

Sonication is used by environmental testing labs to process soil and sediment samples. Sonication takes just 8-10 minutes per sample versus 4-18 hours by soxhlet extraction, it uses half the solvent and improves yields.

Model	Ultrasonic frequency	Maximum power	Duty ratio (%)	Optional Probes diameter	Standard probe size included with machine	Capacity (ml)	Temp. control
SONIC-150W	20-25 KHz	150W	1-99%	3mm	6mm	10-100ml	No
SONIC-250W	20-25 KHz	250W	1-99%	3mm	6mm	10-200ml	No
SONIC-650W	20-25 KHz	650W	1-99%	2,3,8,10,12, 15mm	6mm	0.5-500ml	No
SONIC-650WT	20-25 KHz	650W	1-99%	2,3,8,10,12, 15mm	6mm	0.5-600ml	Yes
SONIC-950WT	20-25 KHz	950W	0.1-99.9%	2,3,8,10,12, 15, 18mm	6mm	0.5-600ml	Yes
SONIC-1200W	19.5-20.5KHz	1200W	1-99%	15,25ml	20mm	50-1000ml	No
SONIC-1200WT	19.5-20.5KHz	1200W	0.1-99.9%	15,25ml	20mm	50-1000ml	Yes
SONIC-1800W	19.5-20.5KHz	1800W	0.1-99.9%	25,28ml	25mm	50-1200ml	Yes
SONIC-2000WT	19.5-20.5KHz	2000W	0.1-99.9%	6,10,12,15, 20,25,28ml	25mm	50-1800ml	Yes

**Parameters:**

**Power Rating:** 150 -2000 w  
**Operating Frequency:** 20-22 KHZ  
**Input power:** 100 -240V, 50 - 60Hz  
**Programmable Timer:** 0-999 minutes  
**Crusher capacity:** 0.5-1200 ml (expansion available)  
 99 program can be stored.

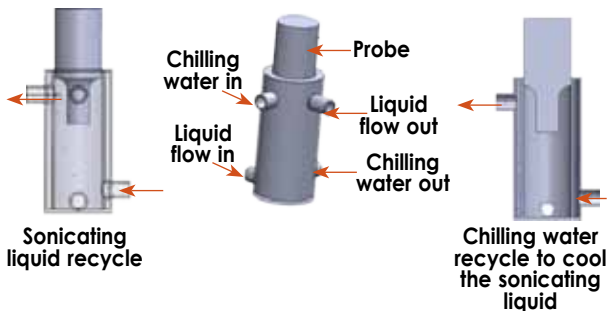
**Optional:**

**Standard Probes** - Probes are made from titanium and machined to specific sizes and shapes. When driven at their resonant frequency, they expand and contract longitudinally. This mechanical vibration is amplified and transmitted down the length of the probe. In liquid, the probe causes cavitation which constitutes the main mechanism for sample processing. Choosing the appropriate horn is extremely important. The sample volume to be processed is directly related to the tip diameter.

**Cup horn/probe** - Cup horn for ultrasonicator : This indirect Sonication eliminates the need for a probe to come in contact with your sample. This technique is often described as a high intensity ultrasonic bath. The ultrasonic energy is transmitted from the horn, up through the water and into a vessel or multiple sample tubes. Indirect sonication is most effective for very small samples because foaming and sample loss are eliminated. Pathogenic or sterile samples are ideal for this method because aerosols and cross contamination are prevented. The Cup Horn and Microplate Horn deliver indirect sonication and are ideal for many high throughput applications.

**Microtube holder** - up to 2-8 samples (0.1-2ml) can be treated simultaneously. Pressure plate holds tubes in place. Avoid contamination by toxic samples.

**continuous cell flow** - 316 stainless steel with double walls through which cooling water can circulate, This flow cell allows for 10 L per hour sonication. It works with 10-20mm probes; and with 950w to 2000w syclon ultrasonic processors.



**Ordering Information:**

- Ultrasonicator includes:
- Generator/transducer
  - Converter with cable
  - One replaceable probe
  - Power cable
  - Wrench set
  - Operation manual
  - Please specify desired voltage for export.

**Optional Probes:**



**Optional CUP:**



**Optional Glass Cell Flow:**







**VP-Series, Oil-Free Vacuum Pump/Compressor**

VP Series vacuum pump is a piston-powered, oil-free pump. With innovative electronic, mechanical technology and human design concept make.

VP Series is quiet and low vibration, compact and light weight, clean and maintenance free, safe & comfortable.

- **No air pollution, maintenance free**  
VP Series pumps are driven by Piston, no need for lubricant, regular oil changes and maintenance; with no oil pollution.
- **Quiet and low vibration**  
Driven direct by motor with no additional belt-driven transmission; the quality vibration-proof assembly makes VP Series run at the lowest noise level among all other equivalent pumps.
- **Thermal protection device**  
Every motor of VP Series pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then restart it when the temperature cools down.
- **Air inlet filter cartridge**  
Every VP Series pump is equipped with moisture trap in air inlet to filter particle, moisture and extend the life of the pump.

They are adaptable to many laboratory and industry requirements, such as:

- Liquid filtration for microbiology
- Liquid filtration for suspended solid test
- Air sampling
- Vacuum tweezers
- Aeration bubbler
- Vacuum oven.



**Cables for VP-17D: 12VDC**

Model	VP-17/VP-17D	VP-34	VP-19	VP-58	VP-33	
<b>Power</b>	220-240V/50Hz / DC 12V	220-240V/50Hz	220-240V/50Hz	220-240V/50Hz	220-240V/50Hz	
<b>Max power consumption (W)</b>	60 / 35	100/80	100/80	190/180	190/180	
<b>Max. current (A)</b>	0.3 / 3	1.0/0.4	1.0/0.4	1.7/1	1.7/1	
<b>Max. vacuum</b>	670mmHg (89.3kPa) (120millibar) / 650mmHg (86.5kPa) (146millibar)	670mmHg (89.3kPa) (120millibar)	730mmHg (97.3kPa) (40millibar)	650mmHg (86.7kPa) (146millibar)	730mmHg (97.3kPa) (40millibar)	
<b>Vacuum</b>	<b>0mmHg</b>	17 l/min=0.6CFM	34 l/min=1.2CFM	19 l/min=0.67CFM	58 l/min=2.05CFM	33 l/min=1.17CFM
	<b>100mmHg</b>	14 l/min=0.49CFM	31 l/min=1.09CFM	18 l/min=0.64CFM	52 l/min=1.84CFM	30 l/min=1.06CFM
	<b>200mmHg</b>	12 l/min=0.42CFM	29 l/min=1.02CFM	16 l/min=0.57CFM	46 l/min=1.63CFM	27 l/min=0.95CFM
	<b>300mmHg</b>	9.5 l/min=0.34CFM	23 l/min=0.81CFM	14 l/min=0.49CFM	40 l/min=1.41CFM	25 l/min=0.88CFM
	<b>400mmHg</b>	7 l/min=0.25CFM	19 l/min=0.67CFM	11 l/min=0.39CFM	30 l/min=1.06CFM	20 l/min=0.71CFM
	<b>500mmHg</b>	4.5 l/min=0.16CFM	13 l/min=0.46CFM	9 l/min=0.32CFM	16 l/min=0.57CFM	14 l/min=0.49CFM
<b>600mmHg</b>	1.5 l/min=0.05CFM	4 l/min=0.14CFM	6 l/min=0.21CFM	6 l/min=0.21CFM	12 l/min=0.42CFM	
<b>Motor rotation</b>	1450 RPM / 1800 RPM	1450 RPM	1450 RPM	1450 RPM	1450 RPM	
<b>Capacitor</b>	6uf/250V/ 2uf/450V	10uf/250V/ 3uf/450V	10uf/250V/ 3uf/450V	16uf/250V/ 5uf/400V	16uf/250V/ 5uf/400V	
<b>Horse power</b>	1/8HP	1/6HP	1/6HP	1/4HP	1/4HP	
<b>Pole</b>	4P	4P	4P	4P	4P	
<b>Net wet</b>	4.1kg / 3.5	5.2kg	5.2kg	7.6kg	7.6kg	
<b>Gross wet</b>	5.1kg / 4.5	6.2kg	6.2kg	8.6kg	8.6kg	
<b>Port thread</b>	8mm	8mm	8mm	8mm	8mm	
<b>Noise level</b>	50dB	50dB	50dB	52dB	52dB	



ST-Series

## ST-Series, Rotary Vane Vacuum Pump

### Features:

- **High vacuum, high flow rate**  
ST Series pumps are driven by rotary vane, with high flow, vacuum can reach over 0.1 Torr. It is suitable for laboratories that need high/medium volume and vacuum for experiments.
- **Quiet and low vibration**  
ST Series pumps feature low noise level, low vibration and long product life.
- **Thermal protection device**  
Every motor of ST Series pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then restart it when the temperature cools down.

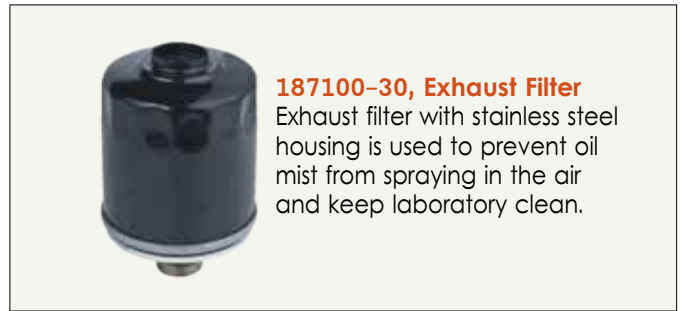
### Applications:

- Vacuum filtration
- Vacuum drying
- Vacuum oven
- Centrifuge
- Various vacuum application.



### 187100-10, Lubricant

ST SC is a special formulation lubricant for ST's pump. It features excellent viscosity, high temperature resistance and strong antioxidant capacity.



### 187100-30, Exhaust Filter

Exhaust filter with stainless steel housing is used to prevent oil mist from spraying in the air and keep laboratory clean.

Model	ST-85		ST-140		ST-42		ST-185	
<b>Voltage</b>	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
<b>Max. power (W)</b>	250		375		250		375	
<b>Max. current (A)</b>	4.2	2.5	6.5	3.0	4.2	2.5	6.5	3.0
<b>Max. vacuum (Torr/Milibar)</b>	0.1 (0.13)		0.1 (0.13)		0.05 (0.066)		0.05 (0.066)	
<b>Max. Flow CFM (L/Min)</b>	3.0(85)	2.5(70)	5.0(142)	4.5(127)	1.5(42)	1.3(36)	3.0(85)	2.5(70)
<b>Motor Pump Speed</b>	1725 rpm	1440 rpm	1725 rpm	1440 rpm	1725 rpm	1440 rpm	1725 rpm	1440 rpm
<b>Motor Horsepower (HP)</b>	1/3		1/2		1/3		1/2	
<b>Intake Connection (mm)</b>	8		8		8		8	
<b>Noise Level (dB)</b>	52		52		52		52	
<b>Gross Weight (kg)</b>	9.6		13		11.4		14	
<b>Dimensions (LxMxHmm)</b>	314x122x256		335x138x270		314x122x256		385x206x304	

Brass hose barb



Quick coupling for VP Series pumps



L type connector



Chemical resistant connector



Check valve



Vacuum regulator (glass) for CVP-13



Vacuum regulator



Air outlet for VP-Series



Silicon tube



Foot switch (167200-41)





## CVP-13/14/32, Chemical Resistant Pumps

### Features:

- High chemical resistance**  
 All wetted parts of CVP Series pump are made of PTFE material which can resist most corrosive gasses.
- No air pollution, maintenance free**  
 CVP Series pumps are driven by Diaphragm. No need for lubricant, regular oil changes and maintenance; with no oil pollution.
- Quiet and low vibration**  
 Driven direct by motor with no additional belt-driven transmission; the quality vibration-proof assembly makes CVP Series run at the lowest noise level among all other equivalent pumps.
- Thermal protection device**  
 Every motor of CVP Series pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then restart it when the temperature cools down.



### Applications:

- Vacuum filtration • Gel electrophoresis • Solid-Phase Extraction (SPE) • Solvent purification • Rotary evaporator (CVP-13 only).



Model	CVP-14		CVP-32		CVP-13 / CVP-13-1	
<b>Power</b>	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz	110V/60Hz	220V/50Hz
<b>Max power consumption (W)</b>	70	60	90		90	
<b>Max. current (A)</b>	0.8	0.32	1.1	0.5	1.2	0.5
<b>Max. vacuum</b>	670mmHg (89.3kPa) (120milibar)		670mmHg (89.3kPa) (120milibar)		750mmHg (99kPa) (13milibar)	
<b>Max. flow rate</b>	20 l/min	20 l/min	38 l/min	33 l/min	20 l/min	20 l/min
<b>Max. pressure</b>	25PSI		30PSI		30PSI	
<b>Vacuum</b>	<b>0mmHg</b>	14 l/min=0.49CFM	28 l/min=0.99CFM		13 l/min=0.46CFM	
	<b>200mmHg</b>	8 l/min=0.28CFM	16 l/min=0.57CFM		7 l/min=0.25CFM	
	<b>400mmHg</b>	4 l/min=0.14CFM	8 l/min=0.28CFM		4 l/min=0.14CFM	
	<b>500mmHg</b>	3 l/min=0.11CFM	6 l/min=0.21CFM		3 l/min=0.11CFM	
<b>Motor rotation</b>	1700 RPM	1450 RPM	1700 RPM	1450 RPM	1700 RPM	1450 RPM
<b>Capacitor</b>	2uf/450V		4uf/400V		4uf/450V	
<b>Horse power</b>	1/8HP		1/6HP		1/6HP	
<b>Pole</b>	4P		4P		4P	
<b>Net wet</b>	5kg		7kg		7kg	
<b>Gross weight</b>	5.2kg		7.4kg		7.4kg	
<b>Port thread</b>	8mm		8mm		8mm	
<b>Noise level</b>	50dB		50dB		50dB	



**BSU-25, BSU-35, BSU-40, Portable Suction System**

**Features:**

- **Adopts oil-free vacuum pump**  
No lubricant required, maintenance free, low noise and durable.
- **Dual overflow protection**  
A built-in spill-proof buoy, 0.2 µm PTFE hydrophobic disc filter between waste bottle and pump prevents the medium and bacteria from flowing into the pump.
- **Autoclavable**  
Waste bottle and disc filter are autoclavable.

**Applications:**

- Cell culture.
- Medium suction.

**Ordering Information**

- 167225-11(22)**  
BSU-25 suction system AC110V, 60Hz (AC220V, 50Hz)
- 167235-11(22)**  
BSU-35 suction system AC110V, 60Hz (AC220V, 50Hz)
- 167240-11(22)**  
BSU-40 suction system AC110V, 60Hz (AC220V, 50Hz)
- 167200-31** 1000ml waste bottle  
**167200-32** 2000ml waste bottle  
**167200-41** universal foot switch  
**167200-35** Disc filter (37mm) for BSU-25, 35  
**167200-36** Disc filter (50mm) for BSU-40



Model	BSU-25	BSU-35	BSU-40
<b>Pump type</b>	Diaphragm	Piston	Piston
<b>Max. vacuum</b>	680 mmHg	680 mmHg	700 mmHg
<b>Max. flow rate</b>	25 l/min	35 l/min	40 l/min
<b>Port thread</b>	5/16 inch (8 mm)	5/16 inch (8 mm)	5/16 inch (8 mm)
<b>Safety</b>	Thermal protector, auto reset		
<b>Foot switch</b>	-	-	On for suction, Off for release
<b>Waste bottle capacity</b>	1000 ml	2x 1000 ml	2000 ml
<b>N. W. / G. W.</b>	4.3/ 5.2 kg	6.9/ 8.0 kg	12/16.2 kg
<b>Machine dim. (cm)</b>	37(L)x15(W)x25(H)	27(L)x30(W)x28(H)	54(L)x26(W)x35(H)
<b>Packing dim. (cm)</b>	43(L)x22(W)x32(H)	41(L)x36(W)x37(H)	62(L)x32(W)x44(H)

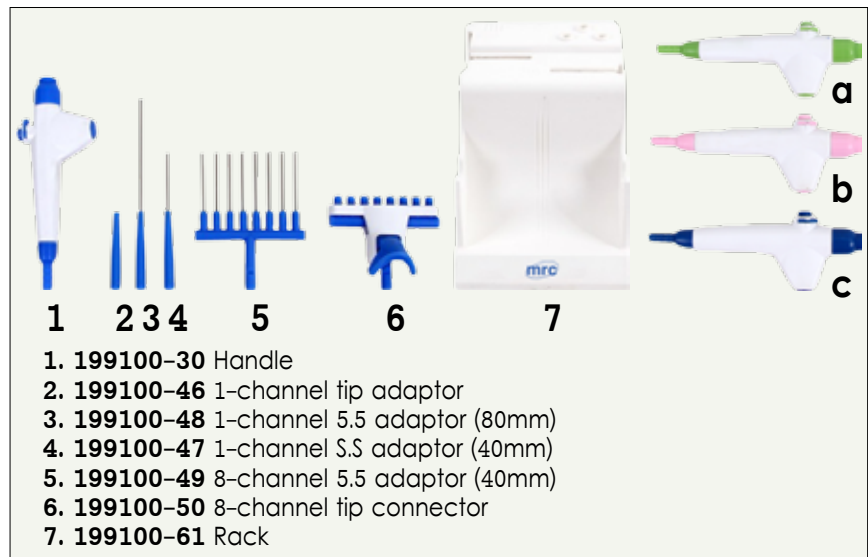
## SUC-KIT, Suction Kit

### Features:

- User-friendly lock switch design**  
 SUC-KIT's ergonomic handle and friendly designed lock switch can keep continuous suction without pressing button all the time.
- Single-handed tip ejection**  
 The innovative design of 8-channel adapter enables tip ejection with single hand, more convenient to use.
- Multi-functional storage rack**  
 Exclusive designed rack can accommodate all the fittings in order. A built-in liquid collection tray can receive liquid residue dripping from the fittings.
- Quick fitting change**  
 Quick connection coupling between fitting and handle can make any fittings replaced quickly.
- Autoclavable**  
 The complete kit except rack are made of POM & stainless steel material available for autoclave.

### Applications:

- Cell culture.
- Waste suction.
- ELISA wash solution.



### Ordering Information

#### 199100-00

SUC-KIT-LB (Light Blue)  
 Complete kit includes handle, rack & 5 kinds adaptors (No.2-6).

#### a. 199110-00

SUC-KIT-DB (Deep Blue)

#### b. 199120-00

SUC-KIT-P (Pink)

#### c. 199130-00

SUC-KIT-G (Green)

Model	SUC-KIT
Operation type	Press to suck
Port thread	5 mm
Fitting part	Material
Handle	POM
1-channel tip adaptor	POM
1-channel S.S. adaptor	POM and SUS 304
8-channel tip adaptor	POM
S.S.8-channel adaptor	POM and SUS 304
Rack	ABS

**BSU-34-SUC-KIT, Portable Suction System**

**Features:**

- **Space-saving and safe operation**  
BSU-34-SUC-KIT is a unique integrated suction system by combining vacuum source with suction kit. Its compact design saves more bench space than other traditional models. With a fence-like platform design, it can prevent user's negligence from tipping over the suction bottle.
- **Dual overflow protection**  
A built-in spill-proof buoy, waste bottle plus 0.2 µm PTFE hydrophobic disc filter between waste bottle and pump prevent the medium and bacteria from flowing into the pump.
- **Autoclavable**  
Suction bottle is made of PES and the fitting parts are made of POM. All of which are autoclavable.

**Applications:**

- Cell culture.
- Waste suction.
- ELISA wash solution.



**Ordering Information**

**197403-11(22)** BSU-34-SUC-KIT portable suction system, AC110V, 60Hz (AC220V, 50Hz), complete set includes:  
 • BSU-34 suction unit • SUC-KIT-LB Suction Kit • 1200 ml PES Suction bottle.  
**197000-11** 1200 ml PES suction bottle.

Model	BSU-34-SUC-KIT	
<b>Voltage</b>	110V/60Hz	220V/50Hz
<b>Max. vacuum</b>	720 mmHg (95.9kPa) (53.3 mbar)	
<b>Max. flow rate</b>	37 l/min	34 l/min
<b>Port thread</b>	3/16 inch (5mm)	3/16 inch (5mm)
<b>Thermal protector</b>	Yes	Yes
<b>Pump type</b>	Piston	Piston
<b>Fitting part</b>	Material	
<b>Suction bottle</b>	PES (1200ml) [PolyEtherSulfone]	
<b>Suction kit</b>	POM	
<b>Dispensing tubes</b>	SUS304	
<b>Rack</b>	ABS	



**AS-3**

**AS-3, Water Pump Aspirator**

**Feature:** This apparatus is equipped with low-noise 150W motor, & this Aspirator of high suction ability. It can reach the vacuum station you need at very short time. Applied on the fields of vacuum evaporator, vapor filtration and all suction's procedures.

**Options:** Cooling coil, s.s tank, vacuum regulator meter.

<b>Vacuum capacity</b>	5°C	10°C	20°C	30°C
	7mmHg	12mmHg	20mmHg	28mmHg
<b>Air velocity</b>	16~18L/Min x2			
<b>Motor</b>	Induction motor 150W			
<b>Tank</b>	Polypropylene tank 10L			
<b>Suction port</b>	Two suction port 8 mm			
<b>Overflow &amp; drain</b>	Overflow nozzle 17.5 mm			
<b>Aspirator tube</b>	2 Pieces			
<b>Power</b>	110V/220V, 260VA			
<b>Dimensions (mm)</b>	360Lx240Wx390H			

**VT-03E/04E, Viscolesters**

VT-04E

This product is designed for a wide range of viscosity measurements. It is suitable for checking industrial substances such as heavy oil, paint, and adhesives. It can be used for quality control in manufacturing processes of foodstuffs and other products. When inspecting construction vehicles and other machinery, the unit can serve to measure not only the viscosity of hydraulic oil but also of tight spindle oil, gear oil, etc. The unit employs the rotating cylinder principle. A rotor turning at constant speed is inserted into the liquid to be measured. The resistance to rotor movement caused by the viscosity (torque) is measured using a special mechanism to obtain direct readings in millipascal-seconds (mPa.s) or decipascal-seconds (dPa.s).

- Compact size, can be operated with one hand.
- Battery powered design allows use anywhere.
- Quick startup shows readings immediately after turn-on.
- Direct readings in millipascal-seconds or decipascal-seconds (SI-units).
- Stand and AC adapter available as options.

**VT-03E, Specification**

Measurement range:

No.4 rotor: 2 – 33 mPa•s

No.5 rotor: 15 – 150 mPa•s

No.3 rotor: 50 – 300 mPa•s

Measurement accuracy: Within  $\pm 5\%$  of scale maximum (using supplied cup A or cup B)

Scale calibrated according to JIS Z 8809 viscosity calibration standard

Rotor speed: 62.5 rpm

Power requirements: 6 V DC (four IEC A6P batteries) Of AC adapter VA-05

Current consumption at maximum torque approx. 100 mA

Dimensions: 98 (W) X 181 (D) X 40 (H) mm (without protruding parts)

Weight: Approx. 570 g (without batteries).

**Composition:**

Model	VT-03E	VT-04E
	VT-03 Unit	VT-04 Unit
<b>Rotor</b>	No.3, No.4, No.5	No.1, No.2, No.3
<b>Cup</b>	A, B	No.3 Cup
<b>Extension Rod</b>	-	1 PC
<b>Batteries</b>	4pcs, IEC R6	4pcs, IEC R6

1 **Optional accessory:** Stand VA-04. AC adapter VA-05

**VT-04E, Specifications**

Measurement range: No.3 rotor: 0.3 – 13 dPa's (IV~h No.3 cup)

No.1 rotor: 3 – 150 dPa's (with JIS 300 mL beaker)

No.2 rotor: 100 – 4000 dPa-s (with JIS 300 mL beaker)

Measurement accuracy and reproducibility

Measurement accuracy  $\pm 1\%$  of Indicated value

Reproducibility  $\pm 5\%$  (calibrated with silicon oil)

Rotor speed: 62.5 rpm

Power requirements: 6V DC (four IEC A6P batteries) or AC adapter VA-05

Current consumption at maximum torque approx. 300 mA

Dimensions: 98 (W) X 181 (D) X 40 (H) mm (without protruding parts)

Weight Approx. 570g (without batteries)

**Supplied accessories for VT-03E**

No.3 rotor (dia. 45x47x160mm) SUS304 1

No.4 rotor (dia. 78x46x159mm) AlO50 (alumite) 1

No.5 rotor (dia. 61.2x36x149mm) AlO50 (alumite) 1

Cup A (dia. 92x76mm) AlO50 (alumite) 1

Clip B (dia. 92x76mm) AlO50 (alumite) 1

(Cup B has 30mm diameter hole at the bottom.) IEC R6P (size AA) battery 4

Instruction manual 1

**Supplied accessories for VT-04E**

No.1 rotor (dia. 24x53x166mm) SUS304 1

No.2 rotor (dia. 15x1x113mm) SUS304 1

No.3 rotor (dia. 45x47x160mm) SUS304 1

No.3 Cup (dia. 52.6x75mm) SUS304 1

Extension Rotor (900mm • 300x3) SUS304 1

IEC A6P (Size AA) battery 4

Instruction manual 1

**Sample Amount for Measurement**

	VT-03E	VT-04E
<b>Cup A</b>	approx. 500mL	-
<b>No.3 Cup</b>	-	approx. 170mL
<b>Commercially available 300mL beaker</b>	-	approx. 350mL

**Optional accessory:** Stand VA-04. AC adapter VA-05



**VT-05/06, Uni-Cylinder Rotational Viscometers**



The VT-05/06 is designed for quality control applications in the manufacturing process of industrial products such as petrochemicals, paint, and adhesives, as well as foodstuffs. Viscosity measurements covering a wide range are possible, such as gear oil used in construction machinery. Measurement is performed by simply submerging a rotor in the fluid. The resistance to rotor movement caused by the viscosity (torque) is measured to obtain direct readings.

- Compact and light weight make the unit easily portable and allow operation with one hand.
- Can be powered by alkaline batteries, nickel-Hydride rechargeable batteries, or AC adapter.
- Direct indication of viscosity in millipascal-seconds or decipascal-seconds (SI units).
- Dedicated stand for measurement available as option.

**Usage**

1. Attach rotor to unit and hold unit in the hand or place on dedicated stand. (Unit should be approximately horizontal in either case.)
2. Insert rotor in sample fluid, turn power on, and select rotor number.
3. Press start button and read indicated viscosity.

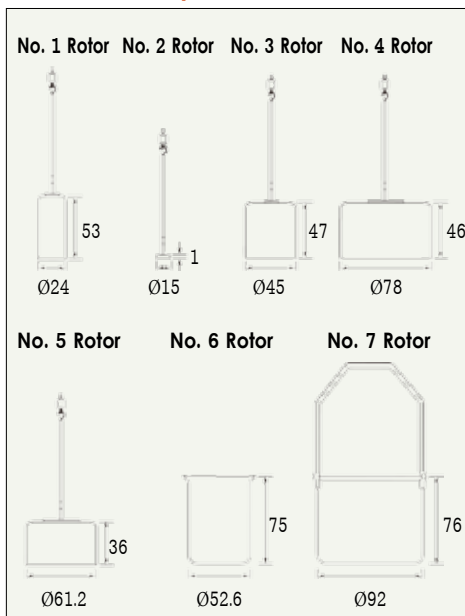
\* VT-06 allows use of No. 1 rotor, No. 2 rotor. and supplied extension rod to reach fluid at a greater distance.

**Specifications**

Model	VT-05 (Low viscosity)	VT-06 (High viscosity)
<b>Measurement range</b>	No. 4 rotor: 2 to 33 mPa•s No. 5 rotor: 15 to 150 mPa•s No. 3 rotor: 50 to 300 mPa•s	No. 3 rotor: 0.3 to 13 dPa•s (with No. 3 cup) No. 1 rotor: 3 to 150 dPa•s (with JIS 300 mL beaker*1) No. 2 rotor: 100 to 4000 dPa•s (with JIS 300mL beaker*1)
<b>Sample fluid capacity</b>	Approx. 460 mL (with Cup A or Cup B)	No. 1 & 2 rotor (with JIS 300mL beaker*1) approx. 300mL. No. 3 rotor (with No. 3 cup) approx. 170 mL Clearance between rotor end and cup bottom: about 15 mm
<b>Measurement accuracy</b>	Within 0 of max. measurement range for each rotor	±10% of indicated value reproducibility ±5
<b>Rotor speed</b>	62.5 rpm	
<b>Power supply</b>	IEC LR6 (size AA) alkaline batteries nickel Hydride rechargeable batteries, AC adapter VA-05J	
<b>Dimensions and Weight</b>	175 (H) x 77(W) x 40(D) mm (without protruding parts) Approx. 260g (without batteries)	
<b>Supplied accessories</b>	No. 3 rotor (dia. 45x47x160mm) SUS304 1 No. 4 rotor (dia. 78x46x159mm) A1050 (alumite) 1 No. 5 rotor (dia. 61.2x36x149mm) A1050 (alumite) 1 Cup A (dia 92x76 mm without hole) A1050 (alumite) 1 Cup B (dia. 92x76 mm, with hole) A1050 (alumite) 1 IEC LR6 (size AA) alkaline batteries 4	No. 1 rotor (dia. 24x53x166mm) SUS304 1 No. 2 rotor (dia 15x1x113mm) SUS304 1 No. 3 rotor (dia. 45x47x160mm) SUS304 1 No. 3 Cup (dia 52x75 mm) SUS304 1 Extension rod (900mm•300x3) SUS304 1 IEC LR6 (size AA) alkaline batteries

\*1 JIS R 3503:1994, Ø78x103 (H)

**Rotors and Cups (unit: mm)**



**Viscotester measurement examples (for reference)**

Product type	Viscosity	Viscotester	Rotor
<b>Newtonian fluids</b>			
Milk	2.6 mPa•s	VT-05	No.4
Soy sauce	5 mPa•s	VT-05	No.4
<b>Lactic fermented beverage</b>			
Olive oil	28 mPa•s	VT-05	No.5
Castor oil	71 mPa•s	VT-05	No.5
Starch syrup	6 dPa•s	VT-06	No.3
	1000 dPa•s	VT-06	No.2
<b>Non-Newtonian fluids</b>			
Tomato juice	230 mPa•s	VT-05	No.3
Condensed milk	16 dPa•s	VT-06	No.1
Chocolate syrup	25 dPa•s	VT-06	No.1
Tomato ketchup	43 dPa•s	VT-06	No.1
Pure honey	76 dPa•s	VT-06	No.1
Toothpaste	320 dPa•s	VT-06	No.2
Starch paste	310 dPa•s	VT-06	No.2

**Options**

Product name	Product number
Stand	VA-04
AC adapter	VA-05J

**CGS Unit and SI Unit**

- P (poise), cP (centi poise).
- Pa•s (pascal-seconds).
- dPa•s (decipascal-seconds).
- mPa•s (millipascal-seconds)
- 1cP = 1/1,000Pa•s = 1mPa•s
- 1P = 1/10Pa•s = 1dPa•s

**Sample amount for measurement**

	VT-05	VT-06
Cup A	approx. 460mL	—
No.3 Cup	—	approx. 170mL
Commercially available 300 mL beaker	—	approx. 350mL



**VIS-1**

#### VIS-1, Viscometer

##### Specification:

VIS-1 Rotational Viscometer is designed for the determination of viscosity and rheological behavior of fluid and semi-fluid. It can also be used to measure the dynamic viscosity and structural viscosity of mineral oil, lubrication oil, adhesives, paints, dyestuff and printing inks, etc.

##### Characteristics:

- Measurement range: 1-1x10<sup>5</sup> mPa.s.
- Rotors: No. 1 2 3 4.
- Rotor speed(rpm): 6/12/30/60.
- Accuracy: ±5% Newtonian Fluid.
- Overall DIM.: 445x235x380mm.
- Net weight: 8 kg.



Rotors	Speed r/min	60	30	12	6
1		100	200	500	1000
2		500	1000	2500	5000
3		2000	4000	10000	20000
4		10000	20000	50000	100000



**VIS-2**

#### VIS-2, Stormer Viscometer

The VIS-2 Digital Stormer viscometer measures fluid viscosity in Krebs Units. A paddle type spindle is driven at 200rpm by a constant speed motor. The reaction torque of the spindle rotating at 200rpm is converted to viscosity in Krebs Units. The digital display of the viscometer shows viscosity in Krebs Units(KU), the associated grams value(gm), and viscosity in centipoise (cP).

##### Application:

Paints, coatings, Adhesives, Inks, Pastes.

##### Features:

- Measure range: 40KU-141KU. 32gm-1099gm. 27cP- 5274cp.
- Accuracy: ±1% (F.S).
- Reproducibility: ±0.5% (F.S).
- Speed: 200 RPM (±0.01 RPM).
- Measuring containers: 1 pint. 1/2 pint.
- Input Voltage: 100V-240V,50Hz/60Hz.
- Net Weight: 7 Kg.

##### Instrument configuration:

- VIS-2 Viscometer.
- Automatic up and down rod and base.
- paddle spindle KU1-10.
- 1/2 pint can adapter. 1 pint can adapter KU 1-74.
- RTD Temperature Probe.

**VIS-8, Digital Basic Rotary Viscometer**

VIS-8

Direct readout of all measurement parameters on an illuminated Liquid Crystal Display • Data on screen: • Speed selected: RPM • Spindle selected: S.P. • Viscosity reading: cP (mPa-s) • Percentage of full scale: % • Sample temperature: °C • Temperature measurement by PT100 probe • Viscosity reading: dynamic viscosity (cP or mPa-s) • The viscometer and the PT100 can be calibrated by the user • Auto range function to determine the maximum viscosity with each spindle/speed combination • It can work with a micro printer • Ultra-sensitive front keyboard that allows easy input of all parameters • "ERROR" message in the screen with sound alarm when the viscosity of the test material exceeds the full scale of the selected combination (SP/rpm.) • Sound alarm if the equipment is working at under 20% of selected full scale • The viscometer is equipped with many pre-sets speeds, from 0.3 to 100 rpm • Safety protection against sudden rises in the power supply • English language options • Direct reading in cP (mPa-s).

<b>Accuracy</b>	± 1% of the full scale
<b>Resolution</b>	Using LVA (Low Viscosity Adapter): 0.01, When viscosity is lower than 10,000 cP:1, When viscosity is equal or higher than 10,000 cP:1
<b>Repeatability</b>	0.5%
<b>Temperature Range</b>	from 0.0°C to + 100.0°C
<b>Resolution</b>	0.1°C
<b>Accuracy</b>	±0.1°C
<b>Type of Probe</b>	PT 100
<b>Outputs</b>	RS232, Micro Printer
<b>Power</b>	All Models are Supplied with 85/265 VAC
<b>Net Weight</b>	4 kg

Model	Measuring Range	Fixed Speeds in R.P.M
VIS-8	10-2,000,000 Cp	0.3,0.6,1.5,3,6,12,30,60

**VIS-S1/S2/S3/AI, Digital Rotary Viscometer, Without Limits**

Direct readout of all measurement parameters on an illuminated Liquid Crystal Display • Data on screen: • Speed selected: r.p.m. • Spindle selected: S.P. • Viscosity reading: cP (mPa-s) • Percentage of full scale: % • Sample temperature: °C • Temperature measurement by PT100 probe • Viscosity reading: dynamic viscosity (cP or mPa-s) • The viscometer and the PT100 can be calibrated by the user • Auto range function to determine the maximum viscosity with each spindle/speed combination • It can work with a micro printer • Ultra-sensitive front keyboard that allows easy input of all parameters • "ERROR" message in the screen with sound alarm when the viscosity of the test material exceeds the full scale • Sound alarm if the equipment is working at under 20% of selected full scale • The viscometer is equipped with many pre-sets speeds, from 0.1 to 100 rpm • Safety protection against sudden rises in the power supply • English language options • Direct reading in cP (mPa-s).



VIS-S3

<b>Accuracy</b>	± 1% of the full scale
<b>Resolution</b>	Using LVA (Low Viscosity Adapter): 0.01, When viscosity is lower than 10,000 cP:1, When viscosity is equal or higher than 10,000 cP:1
<b>Repeatability</b>	0.5%
<b>Temperature Range</b>	from 0.0°C to + 100.0°C
<b>Resolution</b>	0.1°C
<b>Accuracy</b>	±0.1°C
<b>Type of Probe</b>	PT 100
<b>Outputs</b>	Computer interface RS232, Micro Printer
<b>Power</b>	All Models are Supplied with 85/265 VAC
<b>Net Weight</b>	4 kg

Model	Measuring Range	Fixed Speeds in R.P.M
VIS-S1	10-600,000 cP	1-60(nonpolar shift)
VIS-S2	10-6,000,000 cP	0.1-99.9
VIS-S3	10-80,000,000 cP	0.1-99.9
VIS-AI	10-1,000,000 cP	0.1-200.0

## Professional, Rotational Viscometer



VIS-LDV1P

Direct readout of all measurement parameters on an illuminated Liquid Crystal Display • Data on screen: • Speed selected: r.p.m. • Spindle selected: S.P. • Viscosity reading: cP (mPa-s) • Percentage of full scale: % • Sample temperature: °C • Shear rate (with special spindles): SR • Shear stress (with special spindles): SS • Determination of relative viscosity and absolute viscosity compute yield stress • Different menu options • AUTO TEST of the equipment by scanning at different speeds, with audible and visual warning if it is not operating properly • Temperature measurement by PT100 probe • Viscosity reading: dynamic viscosity (cP or mPa-s) • Datalogger function of the obtained results when an experiment is performed. The equipment is supplied with Windows software which can dump the data obtained to a file in Excel format (.xls) for subsequent processing • Determination of shear rate and shear stress with coaxial spindles • The viscometer and the PT100 can be calibrated by the user • Auto range function to determine the maximum viscosity with each spindle/speed combination • It can work with a micro printer or window software... • Ultra-sensitive front keyboard that allows easy input of all parameters. • "ERROR" message in the screen with sound alarm when the viscosity of the test material exceeds the full scale of the selected combination (SP/r.p.m.) • Sound alarm if the equipment is working at under 10% of selected full scale. • The viscometer is equipped with many speeds, from 0.1 to 800 r.p.m. The user can select another different speed into this margin • Safety protection against sudden rises in the power supply.

Model	Measuring Range	Fixed Speeds in R.P.M
VIS-LDV1P	2-2M cP	0.3-100
VIS-RDV1P	100-13M cP	0.3-100
VIS-HADV1P	200-26M cP	0.3-100
VIS-HBDV1P	200-104M cP	0.3-100
VIS-LDV2P	1-6M cP	0.1-200.0
VIS-RDV2P	100-40M cP	0.1-200.0
VIS-HADV2P	200-80M cP	0.1-200.0
VIS-HBDV2P	800-320M cP	0.1-200.0
VIS-LDV3P	1-6M cP	0.1-250.0
VIS-RDV3P	50-40M cP	0.1-250.0
VIS-HADV3P	100-80M cP	0.1-250.0
VIS-HBDV3P	400-320M cP	0.1-250.0

M=1,000,000 cP

## VIS-79 Series, Double Cylinder Digital High Speed Viscometer



VIS-79

**Feature:**

Dv Gather Software is for optional • RTD Temperature Probe • Stepping Motor means Accurate, reliable operation • Direct readout of all measurement parameters • Auto Range Showing • Time Function for measurement • Sound alarm at under 20% Torque • Linear calibration • Wide range power supply: 100V-240V.

**Applications:**







Starch Inks Latex Adhesives (Solvent base) • Polymer Solutions Oils Paints and Coatings Solvents • Cosmetics Dairy Products Pharmaceuticals Juices, etc.

**Optional Accessories:**

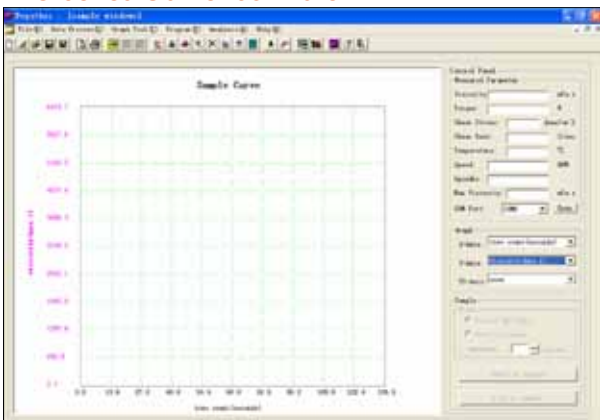
Dv Gather Software • Circulating Water Bath • Standard Oils • Micro Printer.

Model	VIS-79	VIS-79A	VIS-79B	VIS-79P
Range(mPa.s)	1-1M	1-1.5M	1-7.5M	1-75M
RPM	7.5, 75, 750	5-750 Step 10RPM	1-800 Step 10RPM	1-800
Temperature	0-120°C			
Spindles	E, F, G, The three spindles are with B container for high viscosity A, B, C, D, the four spindles are with A container for low viscosity			
Accuracy	±1.0% of Range			
Repeatability	±0.5%			

VIS Accessories

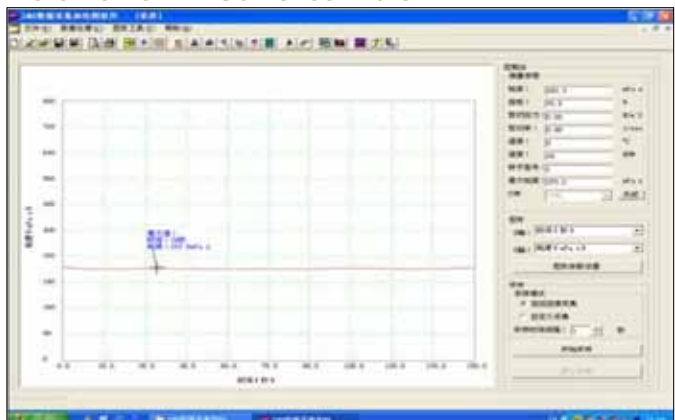
Micro Printer	Low Viscosity Adapter	RTD Temperature Prob
		
<p>Time to print measure information, including temperature, rotation speed, spindle, torque, viscosity.</p>	<p>Super low viscosity adapter (0#spindle). Measure range: 1cp–20cp. Small sample size: 30ml. Material: 314 or 316</p>	<p>RTD Temperature probe. Temperature display range: 0°C–100°C</p>
Small Sample Adapter	Thermosel	Circulating Water Bath (Model: DC-0506)
		
<p>Small sample adapter. Sample volume only from 5ml to 20ml. SC21 – 5–50,000CP SC27 – 25–250,000CP SC28 – 50–500,000CP SC29 – 100–1,000,000CP Not for VIS-1, VIS-8.</p>	<p>Thermosel for elevated temperature testing. The temperature can be used from environment temperature +10°C to 250°C. SC21, SC27, SC28, SC29, four spindles is configured.</p>	<p><b>Specifications:</b> Temperature range: -5°C~+95°C Temperature stability: ±0.1°C Heater wattage: 300W Flow rate: 4L/min Compressor size: 100W Interior size(mm): 250W x 200D x 150H Bath opening(mm): 180W x 140D Applicable ambient: 5°C~35°C Power: AC220V±10%, 50Hz</p>

PRO Series Gather Software



PRO Series viscometer can select PRO gather software to gather data, save data, compare many history curves and download custom program to viscometer, analysis curve to compute Yield stress, plastic viscosity etc.  
Powerful scripting language provides for simple to complex data collection programs.  
Provides looping functions for repetitive tests.  
Automatic calculation of yield stress (bingham plastic, casson, power law, consistency index)

VIS-S1/S2/S3/AI Gather Software



Viscometer can select Gather software to automate collect data, save data, compare many history curve. Data can be saved as a file or exported to excel format.

**GENIE-2T**  
Analog+Timer



**GENIE-2D+Optional H-302** Digital

**GENIE-2, Tube Head & 75mm Platform Head  
GENIE-2T, Include Timer 1~60 Min**

**Features:**

• **Shaking or Vortexing**

**Action:**

Variable speed control allows slow speed shaking action up to high-speed vortexing.

In addition, each attachment is designed to produce different mixing actions, allowing users to choose the correct action for each application.

• **Multi-Task Versatility:**

A broad range of attachments of various shapes, sizes, and materials allows for mixing of almost all common tubes or containers for Hands-Free or Touch operation.

• **Does not walk:**

Tough metal housing combined with "just enough weight", provides a stable platform for all types of mixing.

• **Unmatched Reliability:**

Many years of proven performance in laboratories all over the world.

• **Timer Function:**

Both Touch and Hands-Free mode automatically turns unit off after set time.

Touch Mode: 1-60 seconds. Hands-Free (switch activated Start/Stop) Mode: 1-60 minutes or continuous mode (GENIE-2T).

• **Convenient:**

No need to watch the clock. Unit automatically stops at set time – in Touch Mode or Hands-Free



**GENIE-2** Analog



**Optional:  
Tube holders  
H-302**

**Tube inserts:**  
Fits recessed platform. Accepts tubes from 10mm to 37mm diameter. Inserts hold 4 to 8 tubes, depending upon size.

(switch activated Start/Stop) Mode (GENIE-2T).

- **Reproducibility:** Vortexing time is constant, no matter the day or operator. Accuracy  $\pm 5\%$  (GENIE-2T).
- **Digital speed control and display:** Provides accuracy, reproducibility and repeatability (GENIE-2D).
- **Timer Function:** Touch on for 1-99 seconds. Hands-Free for 1-99 minutes or continuous (GENIE-2D).
- **Hands-Free or Touch:** A 3-position power switch operates with continuous action or "Touch On" control. With the true "Hands-Free" operation of continuous action, lab operators can greatly increase lab efficiency (GENIE-2 & GENIE-2T).

Model	Genie-2	Genie-2T	Genie-2D
<b>Supplied</b>	3-inch Platform, Pop-off Cup		
<b>Speed (RPM)</b>	600-3200 (2700 for 50Hz models)	600-3200 (2700 for 50Hz models)	500-3000 (2850 for 50Hz models)
<b>Timer – Touch On: Hands-Free:</b>	N/A	1-60 seconds 1-60 minutes or continuous	1-99 seconds 1-99 minutes or continuous
<b>Weight</b>	4 Kg	4 Kg	4 Kg
<b>Dimensions (base) (D x W x H)</b>	165 x 122 x 165 mm	165 x 122 x 165 mm	165 x 122 x 165 mm

## SI-P246, Pulsing Vortex Mixer



SI-P246

- True pulsing action provides more collisions and random motion.
- For applications requiring more aggressive action than standard vortexing.
- Variable "RUN/STOP" time provides quick pulsing or interval mixing.
- Fully programmable "ON" and "REST" function reduces heat buildup within the vessel, while keeping materials in suspension. Ideal for heat sensitive samples.
- Use with all Vortex-Genie accessories.
- May also be used as a standard "continuous" Vortex Mixer.
- Digital control and display of speed, time, and "RUN/STOP" time, for reproducibility and accuracy, with true speed display.

Model	SI-P246
<b>Supplied</b>	3 inch Platform, Pop-off Cup
<b>Speed</b>	500-3000 (2850 for 50Hz models)
<b>Timer - Hands Free</b>	1-99 minutes or continuous
<b>Pulse - ON/OFF</b>	0.1 seconds - 99 minutes
<b>Weight</b>	4 Kg (8.8 lb)
<b>Dimensions (base) (D x W x H)</b>	165 x 122 x 165mm

## Accessories for Genie Vortex:

## H-302, Adaptor sets for tubes 10-37mm diameter, Bottles &amp; Flasks

The Large Sample Set (Model H302) can be used with Vortex-Genie 2 mixer for beakers, flasks and large tubes. It consists of a Recessed Platform, 2 Elastic Bands, and an assortment of Foam Inserts for tubes of various diameters (10mm to 37.0mm). A Blank Foam Insert is also provided for user customizing.



H-302

## H-301, Adaptor sets for 5 &amp; 1.5 tubes &amp; microplate

The Multiple Sample Starter Set (Model H301) can be used with Vortex-Genie 2 mixer and consists of a 6-in (152mm) Platform, Microtube Foam Insert and Microplate Foam Insert. Each insert fits snugly into the 6-in Platform attachment to accommodate either 60 microtubes or one standard footprint microplate, respectively.



H-301

Image	Model	Description
	146-6005-00	<b>6-Inch Platform:</b> The 6-inch (152mm) Platform can be used with the Vortex-Genie 2 family of mixers in conjunction with either the Microtube Foam Insert (Part No. 504-0234-00), Microplate Foam Insert (Part No. 504-0235-00). The 6-inch Platform is included in the Multiple Sample Starter Set (Model H301).
	504-0234-00	<b>Microtube Foam Insert (2):</b> Two high-density foam inserts to accommodate up to 60 microtubes. This insert fits into the 6-in (152mm) Platform attachment (Part No. 146-6005-00) and one is included in the Multiple Sample Starter Set (Model H301) for use with the Vortex-Genie 2 family of mixers.
	504-0235-00	<b>Microplate Foam Insert (2):</b> Two high-density foam inserts to accommodate one standard footprint microplate. This insert fits into the 6-in (152mm) Platform attachment (Part No. 146-6005-00) and one is included in the Multiple Sample Starter Set (Model H301) for use with the Vortex-Genie 2 family of mixers.
	504-0039-00	<b>Recessed Platform:</b> The Recessed Platform can be used with the Vortex-Genie 2 family of mixers in conjunction with either Foam Inserts (Part No. 503-0278-00, 503-0279-00, 503-0280-00, 503-0277-00) or Elastic Bands (Part No. 568-0001-00). The Recessed Platform is included in the Large Sample Set (Model H302).
	503-0278-00	<b>9-13mm Tube Foam Inserts (2):</b> Two high-density Foam Inserts to accommodate 9-16mm diameter tubes. The insert fits into the Recessed Platform (Part No. 504-0039-00) for use with the Vortex-Genie 2 family of mixers. One insert is included in the Large Sample Set (Model H302).

























Image	Model	Description
	503-0279-00	<b>14–29mm Tube Foam Inserts (2):</b> Two high-density Foam Inserts to accommodate 14–29mm diameter tubes. The insert fits into the Recessed Platform (Part No. 504-0039-00) for use with the Vortex-Genie 2 family of mixers. One insert is included in the Large Sample Set (Model H302).
	503-0280-00	<b>29–37mm Tube Foam Inserts (2):</b> Two high-density Foam Inserts to accommodate 29–37mm diameter tubes. The insert fits into the Recessed Platform (Part No. 504-0039-00) for use with the Vortex-Genie 2 family of mixers. One insert is included in the Large Sample Set (Model H302).
	503-0277-00	<b>Blank Foam Inserts (2):</b> Two high-density Foam Inserts are customized by the user for odd-shaped vessels. The insert fits into the Recessed Platform (Part No. 504-0039-00) for use with the Vortex-Genie 2 family of mixers. One insert is included in the Large Sample Set (Model H302).
	503-0283-00	<b>Assorted Foam Inserts (4):</b> High-density Foam Inserts for each of the following: 9–16mm Tubes, 14–29mm Tubes, 29–37mm Tubes. A Blank Foam Insert is also included for user customization. Each insert fits into the Recessed Platform (Part No. 504-0039-00) and one of each is included in the Large Sample Set (Model H302) for use with the Vortex-Genie 2 family of mixers.
	568-0001-00	<b>Elastic Bands (2):</b> Two Elastic Bands securely fasten various sample vessels to the Recessed Platform (Part No. 504-0039-00). Two bands are included in the Large Sample Set (Model H302) for use with the Vortex-Genie 2 family of mixers. Sample vessels of up to 500ml can be used as well as microplates.
	146-3011-00	<b>Pop-Off Cup:</b> Plastic pop-off cup for mixing and vortexing in single tubes. The pop-off cup may be used on the Vortex-Genie 1, Disruptor Genie and the Vortex-Genie 2 family of mixers.
	OK-0500-902	<b>3-Inch Platform With Rubber Cover:</b> Plastic 3-inch (76mm) platform with rubber cover (consists of Part No. 580-2013-00) for mixing and vortexing in beakers, flasks and multiple tubes. The plastic 3-inch platform with rubber cover may be used on the Vortex-Genie 2 family of mixers.
	580-2013-00	<b>Rubber Cover For 3-Inch Platform:</b> Replacement rubber cover for the 3-in (76mm) platform. This may be used on the Vortex-Genie 2 family of mixers.
	SI-0564	<b>TurboMix Attachment:</b> The New and Improved patented TurboMix attachment permanently mounts to most existing Vortex-Genie 2 family of mixers to provide extremely vigorous mixing of up to twelve 1.5ml or 2.0ml microtubes (snap-top or screw-cap) through a combination of vortexing and impact collision. This system is ideal for aggressive and rapid dissolution, resuspension or mixing of samples and is also convenient and effective for cell disruption in glass bead procedures.
	SI-0565	<b>Universal Microtube Holder:</b> New and Improved patented removable Microtube Holder for use with the TurboMix Attachment (Part No. SI-0564) on the Vortex-Genie 2 family of products, and the Vortex-Genie Pulse, as well as the Disruptor Genie. Accepts 1.5ml or 2.0ml microtubes (snap-top or screw-cap).
	SI-0511	<b>Large Ampule/Tube Attachment:</b> The Large Ampule/Tube Attachment can be used with the Vortex-Genie 2 family of mixers and provides vigorous end-to-end agitation combined with vortexing of up to four 10mm–17mm diameter tubes or ampules.
	SI-0570	<b>Small Ampule/Tube Attachment:</b> The Small Ampule/Tube Attachment can be used with the Vortex-Genie 2 family of mixers and provides vigorous end-to-end agitation combined with vortexing of up to four 15mm–17mm diameter tubes or ampules.



Image	Model	Description
	SI-H506	<b>Horizontal 50ml Tube Holder:</b> Tube Holder holds six 50mL tubes horizontally. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-H512	<b>Horizontal 15ml Tube Holder:</b> Tube Holder holds twelve 15mL tubes horizontally. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-H524	<b>Horizontal Microtube Holder:</b> Tube Holder holds twenty-four microtubes horizontally. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-V203	<b>Vertical High Speed 50ml Tube Holder:</b> Tube Holder holds three 50mL tubes vertically. Holder snaps on to any Vortex-Genie 2 Mixer. Optimized for high speed vortexing a small number of tubes. No additional attachment necessary.
	SI-V206	<b>Vertical High Speed 15ml Tube Holder:</b> Tube Holder holds six 15mL tubes vertically. Holder snaps on to any Vortex-Genie 2 Mixer. Optimized for high speed vortexing a small number of tubes. No additional attachment necessary.
	SI-V209	<b>Vertical High Speed Microtube Holder:</b> Tube Holder holds nine microtubes vertically. Holder snaps on to any Vortex-Genie 2 Mixer. Optimized for high speed vortexing a small number of tubes. No additional attachment necessary.
	SI-V506	<b>Vertical 50ml Tube Holder:</b> Tube Holder holds six 50mL tubes vertically. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-V512	<b>Vertical 15ml Tube Holder:</b> Tube Holder holds twelve 15mL tubes vertically. Holder snaps on to any Vortex-Genie 2 mixer and the Vortex-Genie Pulse. No additional attachment necessary.
	SI-V524	<b>Vertical Microtube Holder:</b> Tube Holder holds twenty-four microtubes vertically. Holder snaps on to any Vortex-Genie 2 mixer. No additional attachment necessary.
	SI-V525	<b>Vertical 50ml, 15ml, Microtube Holder:</b> Tube Holder holds six 50mL, six 15mL and twelve microtubes vertically. Holder snaps on to any Vortex-Genie 2 product. No additional attachment necessary.
	OK-0236-408	<b>Bottom Closure With Feet Kit:</b> This kit contains the Bottom Closure with Feet and (4) Screws. The Bottom Closure can be easily installed using either a 1/4" nut driver or pliers.
	OK-0236-900	<b>Shock Absorbing Feet (4):</b> Replacement rubber feet kit. This kit is an upgrade to the standard Vortex-Genie rubber feet. These feet are made of shock absorbing Sorbothane™ rubber. Fits on all Vortex-Genie mixers and Disruptor Genie. Kit includes rubber feet plus four mounting screws, which can easily be mounted using a standard screwdriver.



SI-100

- Variable speed control allows slow speed shaking action, up to high speed vortexing
- Compact, robust, durable and efficient design.
- Variable speed control, up to 3000rpm.
- Continuous operation or automatically press start. Fast, thorough, & quiet vortex mixing action, yet vibration free
- Using high quality motor to achieve high performance
- SI-100 with a single cup head suitable for mixing the content of one tube; SI-200 with a platform head suitable for mixing the contents of several test tubes simultaneously or one flask only.

### SI-100 Tube Head, SI-200 100mm Platform Head

#### Features:

- Powerful & quiet.
- Power on LED indicator rugged and sturdy for most demanding applications or tubes.
- Ideal for mixing solutions in small flasks with circular, oscillating movement
- Realize high power, stable motion with low noise
- Tough housing provides a stable platform for all types of mixing
- 3-position power switch operates with continuous action or "touch on" control



SI-200

Model	Max speed	Top head size	Weight (kg)	Size
SI-100	3000rpm	Rubber tube head with Ø26mm	3.2	W160xD130xH170mm
SI-200		Rubber platform head with Ø100mm	4.2	W200xD130xH180mm



SI-600

15 places of 50ml

50 places of 15ml

Optional: Foam Test Tube Racks

### SI-600, Multi-Tube Vortexer

Compact design, benchtop Mix-Smart can be used for virtually any mixing applications. It accommodates micro test tubes, PCR plates, deepwell plates and MTPs. The Mix-Smart only takes up an area of 17x24 cm, less than the size of this A4 paper. But the Mix-Smart can offer many options for holding a wide variety of tubes and plates.

#### Features:

##### Pulsing mode:

Programmable pulsing mode allows user to adjust the pulse-on/pulse-off times between 1~59 seconds in 1 second intervals. This feature enhances the vortex action by creating a more vigorous mix.

##### Microprocessor control:

The variable speed microprocessor control provides consistent uniform mixing action.

##### LCD display:

Independent LCD displays for speed and time allow operator to view both settings at once

##### Applications:

Suspensions, high throughput testing in clinical, environmental, and chemistry labs.

Model	SI-600
Speed Range	500~2500rpm
Speed Accuracy	±25rpm
Timer	1min~99h59min
Orbit	3.6mm
Maximum Weight Capacity	4.5kg
Tray Dimensions	L31xW18cm
Overall Dimensions	L426xW250xH480mm

Model	Tube Capacity	DIM.(mm)
300-02041-01	50xΦ10mm	245x132x45
300-02041-02	50xΦ12mm	245x132x45
300-02041-03	50xΦ13mm	245x132x45
300-02041-04	50xΦ16mm/15ml	245x132x45
300-02041-05	50xΦ25mm	245x132x45
300-02041-06	15xΦ29mm/50ml	245x132x45
300-02041-00	Tray pad set (upper & lower)	305x178.5x25

- Process up to 50 samples at a time
- Displays for speed and time

**Specifications:**

- 2D Mix-Control
  - Optimized mixing
  - Anti-spill technology
- Programmed soft keys
- Reliable universal holder
- Automatic imbalance detection—a common feature in centrifuges
- Integrated vortex function.

Model	SI-500
Mixing Speed	300rpm to 3,000rpm (increment: 10rpm)
Touch vortexing speed	3,500rpm
Power supply	230V/120V, 50/60Hz, 45W
Adjustable mixing time	15s to 99h59min; continuous
Mixing & vortexing radius	1.5mm (3mm mixing Orbit)
DIM.(W x D x H)mm	170x240x140
Weight	4.5kg

**SI-500, Mix Smart**

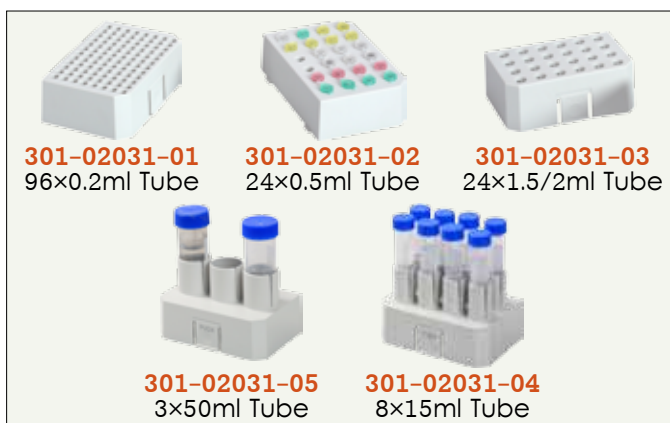
Compact thanks to design, the benchtop Mix-Smart can be used for virtually any mixing applications. It accommodates micro test tubes, PCR plates, deepwell plates and MTPs. The Mix-Smart only takes up an area of 17x24 cm, less than the size of this A4 paper. The Mix-Smart can be offered many options for holding a wide variety of tubes and plates.

**Features:**

- Mixing 3-in-1
- Plates (up to 96-, 384-, and 1536-well formats)
    - PCR plates (skirted, semi-skirted, unskirted)
    - Deepwell plates etc..
    - MTPs
  - Tubes
    - 0.2ml PCR tubes and PCR strips
    - 0.5ml Micro test tubes
    - 1.5ml/2.0ml Micro test tubes
    - 15ml Micro test tubes
    - 50ml Micro test tubes
  - Vortexing numerous tube sizes.

**Applications:**

- Mixing PCR preparations
- Resuspending pellets (e.g., bacteria, DNA, cell culture pellets)
- Incubation (e.g., ELISA assays)
- Colorimetric assays (e.g., Bradford, Lowry, BCA)
- Reporter gene assays (e.g., galactosidase, luciferase)
- Mixing restriction digestion preparations
- Vortexing numerous tube formats (e.g., 15ml and 50ml conical tubes).



Model	Description
301-02031-01	96x0.2ml PCR Tube Holder
301-02031-02	24x0.5ml Tube Holder
301-02031-03	24x1.5ml /2.0ml Tube Holder
301-02031-04	8x15ml Tube Holder
301-02031-05	3x50ml Tube Holder

### SI-0401, SI-0401A, SI-4001, SI-4001A, Microplate Mixers



- Small vortexing orbit of 1.0mm for thorough mixing regardless of sample viscosity, even in 384-well plates.
- Speed and orbit combine to offer true vortexing action in each well of a microplate.
- All models may be used as standard "continuous" microplate mixers/shakers.
- Digital Pulse version is programmable with "ON" and "OFF" Pulsing time between 0.1 seconds to 99 minutes.
- Analog model is ideal for high speed mixing. Digital Pulse model is ideal for precise speed and time control.
- Multi-MicroPlate Genie accepts up to 4 microplates, 8 with optional accessory tray.

Model	SI-0401	SI-0401A	SI-4001	SI-4001A
<b>Speed</b>	750 – 3200 RPM (2700 RPM for 50Hz models)	500 – 3000 RPM (2850 for 50Hz models)	750 – 3200 RPM (2700 RPM for 50Hz models)	500 – 3000 RPM (2850 for 50Hz models)
<b>Time</b>	1–60 min. or continuous	0–99 min. or continuous	1–60 min. or continuous	0–99 min. or continuous
<b>Vortexing Orbit</b>	1.0 mm diameter	1.0 mm diameter	1.0 mm diameter	1.0 mm diameter
<b>Max. Capacity</b>	1 microplate, any type with standard SBS footprint 4 microplates (8 microplates with optional accessory tray)			
<b>Dimensions</b>	165Dx165Wx165H mm	165Dx165Wx165H mm	335Dx240Wx165H mm	335Dx240Wx165H mm
<b>Weight</b>	2.75kg	2.75kg	3.7kg	3.7kg

### SI-150, MicroPlate Mixer



Compact & universal Microplate Mixer can hold 1 or 2 microplates, used in life science field including microbiology, cell & molecular biology, immunology & biotechnology.



Model	SI-150
<b>Voltage (VAC)</b>	100–240
<b>Frequency (Hz)</b>	50/60
<b>Power (W)</b>	20
<b>Shaking movement</b>	Orbital
<b>Orbital diameter (mm)</b>	4.5
<b>Max. shaking weight (with accessory) (kg)</b>	0.5
<b>Motor type</b>	DC brushless motor
<b>Motor rating input (W)</b>	18
<b>Motor rating output (W)</b>	10
<b>Speed range (rpm)</b>	Single microplate: 0–1500 Double microplate: 0–1000
<b>Speed display</b>	Scale
<b>Dimensions (mm)</b>	260x150x80
<b>Weight (kg)</b>	3
<b>Permissible ambient temperature (°C)</b>	5–40
<b>Permissible relative humidity</b>	80%

#### Features:

- Compact and universal Microplate Mixer suitable for small vessels and 96 microplate
- Wide range of accessories, easy installation and replacement
- Continuous operation
- Stepless speed regulation of motor
- DC brushless motor low running noise & long service.

## SI-D248, SI-DD48, Cell Disruptor/Homogenizer



SI-D248, Analog

SI-DD48, Digital

Disrupter Beads

**Features:**

- Dramatically Increased Disruption Efficiency:**  
 Ideal for difficult glass bead procedures – cell disruptions/homogenizations of yeast cells, bacteria, plant and animal tissue and pellet resuspensions. or anything that requires extremely violent high-speed agitation.
- More Than Vortexing Alone:**  
 Patented multi-directional action simultaneously agitates and vortexes at high-speed producing greater yields in less time.
- Digital model:**  
 for accurate, reproducible, repeatable results.
- Economical:**  
 Performance comparable to expensive ultrasonic cell disrupters/homogenizers. Compares favorably to Mini-Bead Beater\*.
- Vortex-Genie Rugged Reliability:**  
 Solid metal casting and stainless steel construction. Does not “walk”.
- Suitable for Use in Cold Rooms or Incubators**
- Vortex Too:**  
 Simply remove the Micro Tube holder and snap on the Pop-off Cup (supplied with the unit) to achieve continuous or timed 0-15 minutes – Analog or 0-99 min– Digital high-speed vortexing of single test tubes.

**Beads:**

- Spherical lead free soda lime glass beads are available in two sizes.
- Can be used for disruption of yeast, bacteria, and other samples.
- Used in combination with Disrupter Genie or Turbo Mix attachment for Vortex-Genie 2 or Vortex-Genie 2T.

**Accessories: (more information in pages 664–665)**

Universal Microtube Holder

Shock Absorbing Feet (4)

Bottom Closure w/ Feet Kit

Pop-off Cup

Model	SI-D248	SI-DD48	Disrupter Beads
<b>Supplied</b>	Universal Microtube Holder (tubes not included) and Pop-off Cup		0.1mm diameter beads for bacteria or 0.5mm diameter beads for yeast
<b>Timer</b>	0-15 min or continuous	0-99 min or continuous	N/A
<b>Speed</b>	3000 RPM (2850 for 50Hz models)	1000-3000 RPM (2850 for 50Hz models)	N/A
<b>Speed Alarm</b>	N/A	On/Off, Adjustable	N/A
<b>Dimensions (base) (D x W x H)</b>	165 x 122 x 190 mm	165 x 122 x 190 mm	N/A
<b>Weight</b>	4.3 kg	4.3 kg	375g



SI-M246

### SI-M246, High Capacity Vortex Mixing

- New adjustable clamping system accommodates a greater variety of containers, including deep well plates and up to (4) 500mL bottles.
- New clamping system allows the user to quickly change from one type of vessel to another.
- Digital control and display of speed and time for reproducibility and accuracy, with true speed display.
- Programmable gentle ramp up to speed, allows use of open containers.
- Use for gentle, orbital-style shaking or more vigorous vortexing.
- Durable and heavy zinc die casting with specially designed feet prevents "walking".
- No additional holders or accessories necessary. Racks are included.
- May be used in cold rooms or incubators.

Model	SI-M246
Supplied (Capacity)	Two 12-Pack Multi-Tube Racks holding up to 24 tubes of any material up to 29mm dia., up to six 250mL vessels, or up to 4 deep well plates
Speed	200-1000 RPM (950 for 50Hz models)
Orbit	4mm dia.
Timer	1-99 minutes or continuous
Dimensions (DxWxH)	310 x 270 x 195 mm
Weight	11.3 Kg (25 lb)



With Teflon Jars  
BMIX-100-T  
Bead Beater

### BMIX-100, Mix Disrupter

#### Tube Holders for reaction vials, PTFE Jars:

- 0.2 ml with 12 places on each arm
- 1.5 ml with 6 and 12 places on each arm
- 2.0 ml with 6 and 12 places on each arm
- 2.0 ml with 24 places on each arm.



#### PCR Plates Holder, Squared PTFE Jars:

- 2x Deep Well Plates
- 6x Microtiter Plates



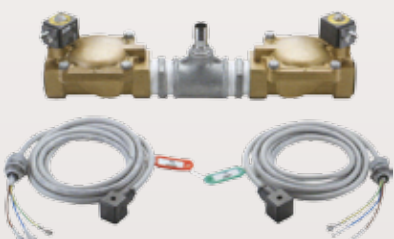
#### Applications:

- High-yield DNA/RNA extracting methods
- Airborne pathogen transmission
- Detection of Mycobacterium tuberculosis in the Air
- Detection of Avian Influenza Virus in Surface Water
- Direct Detection of Pathogens in Food and Water
- Prevent biofilm growth in the distribution systems
- Detection of bacterial genera like Acinetobacter, Campylobacter, Gallionella, Rhizobiales, Rhodococcus, Microbacterium, and classes like Xanthomonadaceae, Rhodocyclaceae, Comamonadaceae.



### Positive Examples:

Airborne pathogen transmission  
 Detection of Mycobacterium tuberculosis in the Air  
 Detection of Avian Influenza Virus in Surface Water  
 Direct Detection of Pathogens in Food and Water  
 Prevent biofilm growth in the distribution systems  
 High-yield DNA/RNA extracting method  
 Detection of bacterial genera like Acinetobacter, Campylobacter, Gallionella, Rhizobiales, Rhodococcus, Microbacterium, & classes like Xanthomonadaceae, Rhodocyclaceae, Comamonadaceae.



### Why choose our glassware washer?

#### Vast range of washing accessories:

MRC offers a vast range of specific trolleys and accessories for washing glassware in chemical, pharmaceutical and petrochemical laboratories. They are made of AISI 316L or 304 steel and of chemical refractory and heat-resistant materials. The combination and choice of the various accessories depend on the type and quantity of glassware to be washed. Particular attention has been paid to shapes and sizes in order to ensure that the accessories are easily interchangeable. The water intakes are automatically coupled to the internal drying air ducts when the door is closed. All the accessories are dimensionally compatible with the various models.

#### Automatic washing:

The automatic washing process of the MRC glassware washers guarantees extremely high performance quality ensuring excellent controllable results, verifiable and repeatable over time. Automatic washing allows achieving impeccable results and the margin of error is reduced to a minimum. The efficiency and thoroughness of automatic washing guarantee an impeccable result and effective disinfection even for the most complex and delicate materials. The risks of damaging the material are eliminated resulting in a longer life and guaranteeing perfect drying.

#### Wastewater separation:

The MRC models can be equipped with a wastewater separation system. This allows separating the washing wastewater full of potentially polluting substances from the rinsing water containing a negligible concentration of pollutants and can therefore be drained into the normal sewerage.

#### Disinfection:

The MRC disinfection machines guarantee impeccable washing and effective disinfection of also complex and delicate instruments. The WG-2045, WG-1060, WG-4060, WG-3060 and WG-4090 models are equipped with automatically regenerated washing water softeners and use freshly drawn water in every phase.

#### Controlled detergent dispensing system:

Washing effectiveness is first and foremost based on proper execution of the detergent and neutralizing phases of the material treated. The models WG-2045, WG-1060 and WG-4060 are equipped with a dispenser for alkaline powder and a peristaltic pump for the acid neutralizer. While the WG-3060 and WG-4090 models have two peristaltic pumps, respectively dedicated to feeding alkaline detergent in the washing phase and acid-based neutralizer in the neutralization phase. Each pump is equipped with a level sensor to be positioned directly in the can of the products used. The machines are designed to dispense up to 4 different additives. Liquid alkaline detergents, new enzyme-based detergents or acid-based neutralizers, caustic soda, disinfectants and/or defoaming additives can be used.

#### Programmable washing cycles:

The heart of the new-generation MRC disinfection machines is the ultra modern control system with microprocessors that control every activity carried out and monitor (by means of redundant system) the entire flow of information processed by the machine. The entire WG Series offers the possibility of programming all the washing parameters by means of a multifunction membrane keyboard or directly from the PC thanks to the RS232 and the software. All the most significant parameters can be set, for example: execution times, operating temperature, additive quantity, number of phases. Access to the control operations is protected by a system of four user passwords.

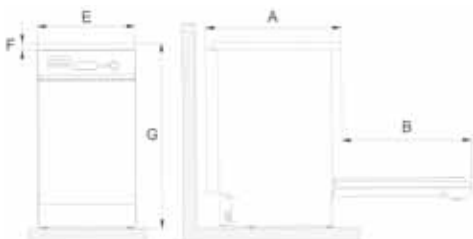


WG-2045

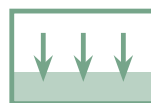
#### WG-2045, Basic Washer

WG-2045 is a glassware washer with reduced dimensions projected to work at 1 or 2 washing levels and to treat substances of different nature. Washing chamber 380x480x580 mm. Possibility of washing and disinfecting.

	WG-2045 (mm)
A	620
B	600
E	450
F	30
G	850



Printer



Optional



Optional



Optional

Model	WG-2045
Electronic control	Microprocessor
Standard programs stored	6
Customisable programs	2
Display with segments & warning light	Yes
Clock and calendar	Yes
Reprogrammable phases	8
Phase parameters	Type of water, detergent quantity, target temperature, extension time in minutes, temperature
Tank internal temperature	From room temperature to 95°C
Accuracy	0.1°C
Temperature sensors in tank	PT 1000 CLASS B IEC 60751
Display	2 digits
Detergent dosing system	Max. 1 powder dispenser & 2 liquid pumps
Detergent level sensor	Optional
Safety lock	Yes, with electromagnetic release
Safety devices	safety thermostats, door interlock
Alarm display	30
Troubleshooting menu	yes, using PC connection
Programme editing	yes, using 2 spare programmes
<b>AUXILIARY FUNCTIONS</b>	
Traceability	storage of data for 100 most recently run programmes
RS232 serial port for PC connection+Printer	Yes
Cycle storage	Yes, Excel format
Cycle file download	Yes
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
Cold water inlet	Yes, max 42°F hardness
Demineralised water inlet	Yes, <20µS/cm
Demineralised water booster pump	Optional
Water softener incorporated	Yes
Recirculation pump	200L/min
<b>WATER HEATING</b>	
Electrical	3.0 kW max
STEAM CONDENSER	Optional
<b>DIMENSIONS LxDxH mm</b>	
Outside (with built-in top)	450x620x850 (830)
Inside	380x480x590
Net weight (Kg)	61
<b>STAINLESS STEEL</b>	
Wash tank	AISI316L
Exterior covering	AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
Max. voltage/power	1/N/PE 230V - 50Hz 3.3 kW
NOISE LEVEL	Max. 50 dB



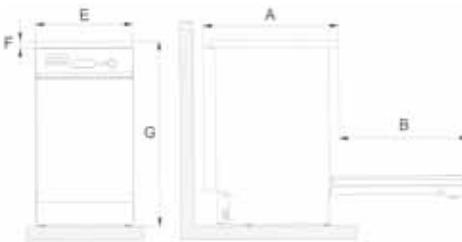


WG-1060

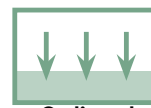
**WG-1060, Basic Washer**

WG-1060 is designed to operate with 1 or 2 levels for treating various types of substances. Washing chamber 520x515x545mm. Possibility of washing & disinfecting.

	WG-1060 (mm)
A	670
B	600
E	600
F	30
G	850



Optional



Optional

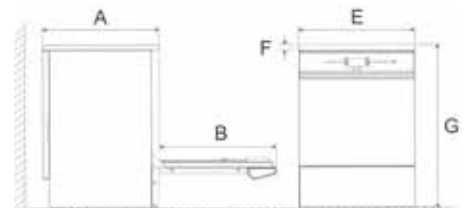


Optional

Model	WG-1060
Electronic control	Microprocessor
Standard programs stored	6
Customisable programs	2
Display with segments & warning light	Yes
Clock and calendar	Yes
Reprogrammable phases	8
Phase parameters	Type of water, detergent quantity, target temperature, extension time
Tank internal temperature	From room temperature to 95°C
Accuracy	0.1°C
Temperature sensors in tank	PT 1000 CLASS B IEC 60751
Display	2 digits
Detergent dosing system	Max. 1 powder dispenser & 2 liquid pumps
Detergent level sensor	Optional
Alkaline powder detergent dispenser	Yes
Pump to dispense acid neutralized liquid	Yes
Pump to dispense alkaline liquid detergent	Optional
Safety lock	Yes, with electromagnetic release and automatic opening
Safety devices	safety thermostats, door interlock
Alarm display	30
Troubleshooting menu	yes, using PC connection
Programme editing	yes, using 2 spare programmes
<b>AUXILIARY FUNCTIONS</b>	
Traceability	storage of data for 100 most recently run programmes
RS232 serial port for PC connection+Printer	Yes
Cycle storage	Yes, Excel format
Cycle file download	Yes
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
Cold water inlet	Yes, max 42°F hardness
Demineralised water inlet	Yes, <20µS/cm
Demineralised water booster pump	Optional
Water softener incorporated	Yes
Recirculation pump	400L/min
<b>WATER HEATING</b>	
Electrical	6.3 kW on tri-phase version, 2.3 kW on mono-phase version
STEAM CONDENSER	Optional
<b>DIMENSIONS LxDxH mm</b>	
Outside (with built-in top)	600x650x850 (830)
Inside	520x515x545
Net weight (Kg)	77
<b>STAINLESS STEEL</b>	
Wash tank	AISI316L
Exterior covering	AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
Max. voltage/power	1/N/PE 230V - 50Hz 2.8 kW 3/N/PE 400V - 50 Hz 7.0 kW
NOISE LEVEL	Max. 50 dB



WG-4060



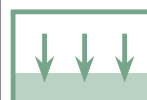
#### WG-4060, Basic Washer

WG-4060 is designed to operate with 1 or 2 levels for treating various types of substances. Washing chamber 520x515x545mm. Possibility of washing, disinfecting and drying with "Drying system".

	WG-4060 (mm)
A	600
B	600
E	600
F	30
G	850



Optional



Optional



Optional

Optional

Model	WG-4060
Electronic control	Microprocessor
Standard programs stored	15
Customisable programs	6
Display with segments & communication led icons	Yes
Clock and calendar	Yes
Reprogrammable phases	8
Phase parameters	Type of water, detergent quantity, target temperature, extension time in minutes, drying temperature & time
Tank internal temperature	From room temperature to 95°C
Accuracy	0.1°C
Temperature sensors in tank	PT 1000 CLASS B IEC 60751
Display	4 digits
Detergent dosing system	Max. 1 powder dispenser & 3 liquid pumps
Detergent level sensor	Optional
Alkaline powder detergent dispenser	Yes
Pump to dispense acid neutralized liquid	Yes
Pump to dispense alkaline liquid detergent	Optional
Safety lock	Yes, with electromagnetic release automatic opening
Safety devices	safety thermostats, door interlock
Alarm display	30
Troubleshooting menu	yes, using PC connection
Programme editing	yes, using 6 spare programmes
<b>AUXILIARY FUNCTIONS</b>	
Traceability	storage of data for 100 most recently run programmes
RS232 serial port for PC connection+Printer	Yes
Cycle storage	Yes, Excel format
Cycle file download	Yes
<b>DRYING SYSTEM</b>	
Drying fan	Yes
Drying heating element	0,8 kW
Prefilter class C 98%	Yes
HEPA filter Class S 99.999%	Optional
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
Cold water inlet	Yes
Demineralised water inlet	Yes, <20µS/cm
Demineralised water booster pump	Optional
Water softener incorporated	Yes
Recirculation pump	400L/min
<b>WATER HEATING</b>	
Electrical	6.3 kW on tri-phase version, 2.3 kW on mono-phase version
STEAM CONDENSER	Optional
<b>DIMENSIONS LxDxH mm</b>	
Outside (with built-in top)	600x650x850 (830)
Inside	520x515x545
Net weight (Kg)	77
<b>STAINLESS STEEL</b>	
Wash tank	AISI316L
Exterior covering	AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
Max. voltage/power	1/N/PE 230V - 50Hz 2.8 kW 3/N/PE 400V - 50 Hz 7.0 kW
NOISE LEVEL	Max. 50 dB

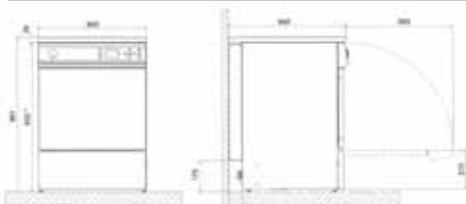
Model	WG-2045	WG-1060	WG-4060
Internal dimensions (LxDxH mm)	380x480x590	520x515x545	520x515x545
External dimensions (LxDxH mm)	450x620x850 (830 with built-in top)	600x650x850 (830 with built-in top)	600x605x850 (830 with built-in top)
Standard programmes stored	6		9
Modifiable programs	2		6
Detergent dosing system	Powder dispenser or peristaltic pump (as optional)		
Neutralizing dosing pump type	Peristaltic pump		
Max nr. of dosing pumps	2	3	
Possibility of volume detergent control	Optional		
Detergent cabinet	n.a.	Optional	
Display	With segments and warning light		With segments and communication led icons
Control panel	Control buttons and program selector knob on the panel		Membrane keyboard
Steam Condenser	Optional		
Drying system	Thermodynamic		Forced hot air through "drying system"
Pre-filter class C	n.a.		Yes
HEPA filter class S 99,999%	n.a.		Optional
Cold water supply	Yes		
Hot water supply	No		
Demineralized water supply	Yes		
Integrated water softener	Yes		
Washing pump	200L/min	400L/min	
Conductivity control	n.a.		
Trolleys Included	yes, upper and lower standard rack	No	
Printer	Optional		
Door interlock	Yes		
Net weight (kg)	61	77	70
Conformity	2006/95/CEE, 93/68/CEE, 2004/108/CEE		
Supply/Max Power	1/N/PE/230V- 50Hz-3.3kW	1/N/PE/230V- 50Hz-2.8kW As an alternative: 3/N/PE/400V- 50Hz-7.0kW	
Possibility of 60Hz supply	Yes		
Equipped with plug	Yes	No	



WG-3060

### WG-3060, Professional Washer

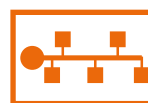
WG-3060 is designed to operate with 1 or 2 levels for treating various types of substances. Standard washing chamber 520x515x545 mm. Possibility of washing, disinfecting and drying.



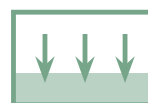
\* Height of built-in version.



Optional



Optional



Optional

Model	WG-3060
<b>Electronic control</b>	3 microprocessors + 1 (optional communication card)
<b>Standard programs stored</b>	20
<b>Customisable programs</b>	10 (expandable to 50)
<b>Backlit graphic LCD display</b>	128 x 64 pixels
<b>Clock and calendar</b>	Yes
<b>Reprogrammable phases</b>	10
<b>Phase parameters</b>	Type of water, detergent quantity, target temperature, extension time
<b>Tank internal temperature</b>	From room temperature to 95°C
<b>Accuracy</b>	0.1°C
<b>Temperature sensors in tank</b>	PT 1000 CLASS B IEC 60751
<b>Detergent level sensor</b>	Optional
<b>Detergent pumps</b>	4 max.
<b>Powder detergent dispenser</b>	Optional
<b>Safety lock</b>	Yes, with electromagnetic release and automatic opening
<b>Safety devices</b>	safety thermostats, door interlock
<b>Alarm display</b>	80
<b>Troubleshooting menu</b>	yes
<b>Programme editing</b>	yes (via password)
<b>Password</b>	4 levels
<b>Display languages</b>	Italian, English, French, German, Russian and others on request
<b>AUXILIARY FUNCTIONS</b>	
<b>External sensor duct</b>	Optional
<b>Traceability</b>	Storage of data for 100 most recently run programmes
<b>Waste water separation solenoid valve control</b>	Optional
<b>RS232 serial port for PC connection+Printer</b>	Yes
<b>Cycle storage</b>	Yes, Excel format
<b>Cycle file download</b>	Yes
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
<b>Cold/Hot water inlet</b>	Yes, 42°F hardness
<b>Demineralised water inlet</b>	Yes, <20µS/cm
<b>Demineralised water booster pump</b>	Optional
<b>Water softener incorporated</b>	Yes
<b>Recirculation pump</b>	400L/min
<b>WATER HEATING</b>	
<b>Electrical</b>	6.3 kW max.
<b>Water pre-heating via boiler</b>	Optional
<b>STEAM CONDENSER</b>	Optional
<b>DIMENSIONS LxDxH mm</b>	
<b>Outside (with built-in top)</b>	600x640x850 (830)
<b>Inside</b>	520x515x545
<b>Net weight (Kg)</b>	76
<b>STAINLESS STEEL</b>	
<b>Wash tank</b>	AISI316L
<b>Exterior covering</b>	AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
<b>Max. voltage/power</b>	1/N/PE 230V - 50Hz 2.8 kW 3/N/PE 400V - 50 Hz 7.0 kW
<b>NOISE LEVEL</b>	Max. 50 dB



WG-4090

**WG-4090, Professional Washer**

WG-4090 is designed to operate with 1 or 2 levels for treating various types of substances. Standard washing chamber 520x515x545 mm. Possibility of washing, disinfecting & drying with Drying System.



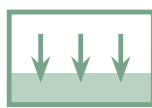
\* Height of built-in version.



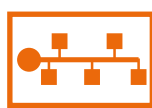
Optional



Optional



Optional



Optional

Model	WG-4090
<b>Electronic control</b>	3 microprocessors + 1 (optional communication card)
<b>Standard programs stored</b>	20
<b>Customisable programs</b>	10 (expandable to 50)
<b>Backlit graphic LCD display</b>	128 x 64 pixels
<b>Clock and calendar</b>	Yes
<b>Reprogrammable phases</b>	10
<b>Phase parameters</b>	Type of water, detergent quantity, target temperature, extension time in minutes, drying temperature & time
<b>Tank internal temperature</b>	From room temperature to 95°C
<b>Accuracy</b>	0.1°C
<b>Temperature sensors in tank</b>	PT 1000 CLASS B IEC 60751
<b>Detergent level sensor</b>	Optional
<b>Detergent pumps</b>	4 max.
<b>Safety lock</b>	Yes, with electromagnetic release automatic opening
<b>Safety devices</b>	safety thermostats, door interlock
<b>Alarm display</b>	80
<b>Troubleshooting menu</b>	yes
<b>Programme editing</b>	yes (via password)
<b>Password</b>	4 levels
<b>Display languages</b>	Italian, English, French, German, Russian and others on request
<b>AUXILIARY FUNCTIONS</b>	
<b>External sensor duct</b>	Optional
<b>Traceability</b>	Storage of data for 100 most recently run programmes
<b>Waste water separation solenoid valve control</b>	Optional
<b>RS232 serial port for PC connection+Printer</b>	Yes
<b>Cycle storage</b>	Yes, Excel format
<b>Cycle file download</b>	Yes
<b>DRYING SYSTEM</b>	
<b>Drying fan</b>	Yes
<b>Drying heating element</b>	2 kW
<b>Prefilter class C 98%</b>	Yes
<b>HEPA filter Class S 99.999%</b>	Optional
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
<b>Cold/Hot water inlet</b>	Yes, max 42°F hardness
<b>Demineralised water inlet</b>	Yes, <20µS/cm
<b>Demineralised water booster pump</b>	Optional
<b>Water softener incorporated</b>	Yes
<b>Recirculation pump</b>	400L/min
<b>WATER HEATING</b>	
<b>Electrical</b>	6.3 kW max.
<b>Water pre-heating via boiler</b>	Optional
<b>STEAM CONDENSER</b>	Optional
<b>DIMENSIONS LxDxH mm</b>	
<b>Outside (with built-in top)</b>	900x640x850 (830)
<b>Inside</b>	520x515x545
<b>Net weight (Kg)</b>	83
<b>STAINLESS STEEL</b>	
<b>Wash tank</b>	AISI316L
<b>Exterior covering</b>	AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
<b>Max. voltage/power</b>	1/N/PE 230V - 50Hz 2.8 kW 3/N/PE 400V - 50 Hz 7.0 kW
<b>NOISE LEVEL</b>	Max. 50 dB



**WG-6090, Professional Washer**



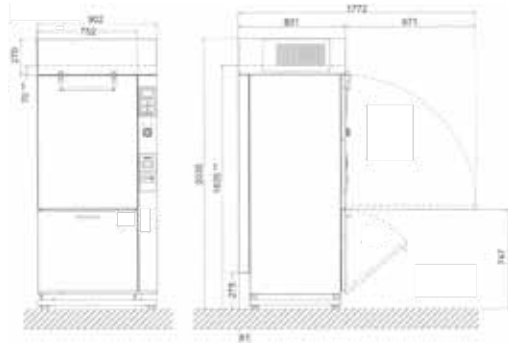
Optional



Optional



Optional



WG-6090 is a machine with a high loading capacity capable of handling large quantities of material in a short space of time & of washing large-sized

instruments. Washing chamber 670x650x835mm (three times the useful volume of medium-sized machines). Able to load up to three direct injection glassware levels or 3 levels with rotating spray arms.

Model	WG-6090
<b>Electronic control</b>	3 microprocessors + 1 (optional communication card)
<b>Standard programs stored</b>	20
<b>Customisable programs</b>	10 (expandable to 50)
<b>Backlit graphic LCD display</b>	128 x 64 pixels
<b>Clock and calendar</b>	Yes
<b>Reprogrammable phases</b>	10
<b>Phase parameters</b>	type of water, detergent quantity, target temperature, extension time, drying temperature and time
<b>Tank internal temperature</b>	From room temperature to 95°C
<b>Accuracy</b>	0.1°C
<b>Temperature sensors in tank</b>	1 PT 1000 CLASS B IEC 60751
<b>Dosing pumps</b>	5 max.
<b>Detergent level sensor</b>	Optional
<b>Safety lock</b>	yes, with electromagnetic release and automatic opening
<b>Safety devices</b>	safety thermostats, door interlock
<b>Alarm display</b>	80
<b>Troubleshooting menu</b>	yes
<b>Password</b>	4 levels
<b>Display languages</b>	Italian, English, French, German, Russian and others on request
<b>AUXILIARY FUNCTIONS</b>	
<b>Traceability</b>	storage of data for 100 most recently run programs
<b>Optional</b>	Waste water separation solenoid valve control/External sensor duct
<b>RS232 serial port for PC connection</b>	Yes
<b>RS232 serial port for printer</b>	Yes
<b>Water quality check</b>	Optional
<b>Cycle storage</b>	Yes, Excel format
<b>Cycle file download</b>	Yes
<b>DRYING SYSTEM</b>	
<b>Drying fan</b>	Yes
<b>Drying heating element</b>	4 kW
<b>Prefilter class C 98%</b>	Yes
<b>HEPA filter Class S 99.999%</b>	Optional
<b>WATER SUPPLY (PRESSURE 1.5-5 BAR)</b>	
<b>Cold/hot water inlet</b>	yes, max 42° F hardness
<b>Demineralised water inlet</b>	Yes, <20µS/cm
<b>Optional</b>	Demineralised water booster pump/External water softener
<b>Recirculation pump</b>	2 pumps of 400 l/min
<b>WATER HEATING</b>	
<b>Electrical</b>	17.7 kW max, Water pre-heating via boiler
<b>DIMENSIONS LxDxH mm</b>	
<b>Outside</b>	2035x801x902 (drying system versions), 1835x801x902 (version without drying system)
<b>Inside</b>	670x650x835
<b>Net weight (Kg)</b>	282
<b>STAINLESS STEEL</b>	
<b>Wash tank/ Exterior covering</b>	AISI316L/ AISI304
<b>ELECTRICAL POWER SUPPLY</b>	
<b>Max. voltage/power</b>	3/N/PE 400V - 50Hz 18.5 kW
<b>NOISE LEVEL</b>	Max. 50 dB

Model	WG-3060	WG-4090	WG-6090
Internal dimensions (LxDxH mm)	520x515x545		670x650x835
External dimensions (LxDxH mm)	600x640x850 (830 with built-in top)	900x640x850 (830 with built-in top)	902x801x2035 (with drying system) 902x801x1835 (without drying system)
Standard programmes stored	20		
Modifiable programs	10 (expandable to 50)		
Detergent dosing system	Powder dispenser or peristaltic pump	Peristaltic pump	
Neutralizing dosing pump type	Peristaltic pump		
Max nr. of dosing pumps	4		5
Possibility of volume detergent control	Optional		
Detergent cabinet	Optional	Yes	
Display	Backlit graphic LCD display 128x64 pixel		
Control panel	Membrane keyboard		
Steam Condenser	Optional		No
Drying system	Thermodynamic	Forced hot air through "drying system"	(as optional) Forced hot air through "drying system"
Pre-filter class C	n.a.	Yes	
HEPA filter class S 99,999%	n.a.	Optional	
Cold water supply	Yes		
Hot water supply	Yes		
Demineralized water supply	Yes		
Integrated water softener	Yes		optional (externally)
Washing pump	400L/min		2x400L/min
Conductivity control	Optional		
Trolleys Included	No		
Printer	Optional		
Door interlock	Yes		
Net weight (kg)	76	83	282
Conformity	2006/95/CEE, 93/68/CEE, 2004/108/CEE		
Supply/Max Power	1/N/PE/230V- 50Hz-2.8kW As an alternative: 3/N/PE/400V- 50Hz-7.0kW		3/N/PE/400V- 50Hz-18.5kW
Possibility of 60Hz supply	Yes		
Equipped with plug	No		

## Machine optionals

**PAD**

Booster pump for non-pressurised demineralized water. Allows feeding the machine with demineralized water drawn from a non-pressurised tank positioned at a minimum height of 85cm from the ground.

**PAD-2**

Booster pump for non-pressurised demineralized water. Allows feeding the machine with demineralized water drawn from a non-pressurised tank positioned on the ground.

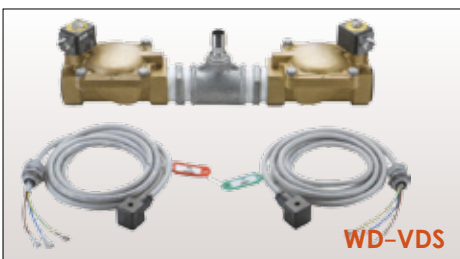
**ADU**

Universal peristaltic pump for liquid additive

- For the dosing of a liquid additive, for ex: alkaline detergent, caustic soda or antifoam
- With st/steel drawing pipe
- Suitable for tanks of 2L, 5L, 10L.

**IC5090**

On the basis of demineralized water conductivity used during the last rinse phase, it allows to detect any impurities and to activate also further rinse phases for achieving a perfect rinse with low conductivity.

**WD-VDS**

Double discharge valve that allows separating and ducting the polluted wastewater from the first washing cycles from the final rinsing water. This wastewater separation device is composed of 1 and 1/2" valves with Viton membrane and valve opening is controlled by the machine microprocessor.

**WD-LS3060**

Detergent level sensor. Allows controlling the level of liquid additives and signals when the detergent has run out. Equipped with an adjustable drawing tube for cans of different heights



**Stainless steel bases and frames**



**B9040**

**B9040**

Base for 90 cm wide models only. The frame allows bringing the machine loading level up to an ergonomic height approximately 70 cm from the ground. Entirely made of stainless steel. A detergent compartment with anti-drip bottom and front door with push-pull opening is integrated in the base. Dimensions l x d x h = 900x530x400mm.

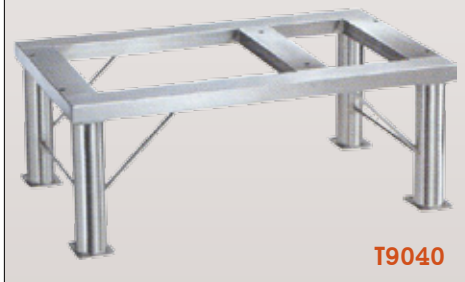
**B6040** (not shown in the photo): for 60 cm wide models only. Dimensions l x d x h = 600x530x400mm.



**B9040QWC**

**B9040QWC**

Base with integrate demineralized water boiler. For 90 cm wide models only. A boiler is housed in the base to preheat the demineralized water to get fastest cycles. Dimensions: l x d x h = 900x530x400mm.



**T9040**

**T9040**

Frame for 90 cm wide models only. The frame allows bringing the machine loading level up to an ergonomic height approximately 70 cm from the ground. The frame also facilitates cleaning the machine underneath. Entirely made of stainless steel. Dimensions l x d x h = 900x530x400mm

**T6040** (not shown in the photo): frame for 60cm models only. Dimensions l x p x h = 600x530x400cm.

**Traceability options**

**WD-PRINT**

External 24-character impact matrix printer with real-time clock function. Complete with thermal paper roll.



**WD-PAPER**

Thermal paper roll. Diameter 50 mm, width 57mm.

**WG-2045 Configurations**



**Two spraying levels**

This configuration has two washing levels with rotary sprays where supports for all types of glassware can be located (beakers, test tubes, flasks, plates & various other materials).

Photo:

**D-CS1** upper rack: SB9 straight tine support for beakers & flasks to the left, SB14 spring tine support to the right. Each support occupies 0.5 the rack for machines with width of 45cm.

**D-CS2** lower rack: SB28 universal spring support for beakers & flasks, standard on 50-cm models, occupying all of the lower base but cannot be positioned on the upper rack.

**Two spraying levels**

This configuration has two washing levels with rotary sprays where supports for all types of glassware can be located (beakers, test tubes, flasks, plates & various other materials).

Photo:

**D-CS1** upper rack: the carriage is fitted with 2 racks equipped with compartments (CP192 and CP222) to wash test tubes.

**D-CS2** lower rack: SB9 straight tine support for beakers & flasks to the left, SB14 spring tine support to the right. Each support occupies 0.5 the rack for machines with width of 45cm to optimize the load on the rack.





#### One injection level

The LM24 is secured to the lower D-CS2 base using 2 special fastenings. This solution is suitable for washing narrow-necked glassware of different sizes. It has a capacity of 24 items and can wash both large items and small flasks or bottles. ULB 40 adaptor nozzles for pipettes can also be fitted. The maximum height of glassware is 500mm.

Photo:  
LM24 support.



#### Two spraying/injection levels

In this configuration there are two washing levels: lower level with rotary sprayers to hold various supports (beakers, test tubes, flasks). The D-CS1 upper base is fitted with the 24-position LM22S injection base. This configuration allows simultaneous washing of narrow-necked and other types of glassware.

Photo:  
D-CS2 lower rack: SB9 straight tine support for beakers and flasks to the left, SB14 spring tine support to the right. Each support occupies 0.5 the rack for machines with width of 45cm to optimize the load on the rack.



#### One mixed injection level

This configuration allows simultaneous washing of narrow-necked glassware (flasks, and beakers) and 12 pipettes with a maximum height of 510mm. This is an ideal solution for washing various types of glassware simultaneously without having to use dedicated separate carriages with a greater capacity.

Photo:  
LPM24 carriage.



#### Two spraying/injection levels

In this configuration there are two washing levels: the upper level is fitted with the KP60 seventy-item base for centrifuge vials and test tubes. The lower level is spare.

Photo:  
D-CS1 upper rack: KP60 base.  
D-CS2 lower rack: SB9 straight tine support for beakers and flasks to the left, SB14 spring tine support to the right.



#### Two injection levels

LM46 carriage consisting of two injection levels for a capacity of 46 items. This version maximizes the injection washing capacity. The maximum height of glassware is 225 mm. Recommended for flasks (ISO1042) with volume of 5 to 200 ml, bottles (ISO 4796) up to 1000 ml and flasks up to 1000 ml.

Photo:  
LM46 carriage composed by 22-position upper rack and 24-position lower rack.



#### Two spraying levels

Standard lower basket CS2 and upper basket with sprayer CS1-1. In this configuration there are two washing levels with rotary sprayers where all the supports for the various glass items can be positioned (it can be used for washing beakers, test tubes, flasks, plates and various other materials). The upper basket CS1-1 can be positioned on two levels to make better use of the space.



#### Two spraying/injection levels

Standard lower basket CS2 and upper injection basket. In this configuration there are two washing levels: a lower level with rotary sprayers to hold various supports (beakers, test tubes, flasks) and an upper level with a 40-position injection trolley LM40S (LM40SDS for machines with drying system).

This configuration allows simultaneous washing of narrow-necked and other types of glassware.



#### One spraying/injection level

LM20 trolley (LM20DS for machines with drying system) one half with a multi-spigots injection system and the other half to hold supports. In this case, narrow-necked glassware up to 500 mm in height can be washed at the same time as test tubes. Compared to the configuration with two spraying/injection levels, this one has the advantage that you can wash glassware more than 245mm in height.



#### One injection level

LM40 trolley (LM40DS for machines with drying system). It may be considered as a universal injection trolley as it optimizes washing of narrow-necked glassware of different sizes. It has a capacity of 40 items and can wash both large items and small flasks or bottles.



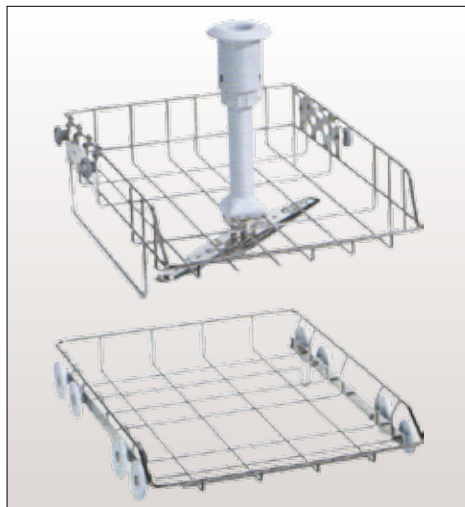
#### Two injection levels

LM80 trolley (LM80DS for machines with drying system) with two injection levels for a capacity of 68 items. This version maximizes the injection washing capacity.



#### One mixed injection level

LPM20/20 trolley (LPM2020DS for machines with drying system): this system allows simultaneously washing narrow-necked glassware (flasks, beakers, round-bottom flasks) and 20 pipettes. It is a valid solution when needing to wash many different types of glassware at the same time without having to resort to a specific larger capacity trolley.

**Basic trolleys****D-CS1** (only on WG-2045 model)

Upper carriage with sprayer. Made for stainless steel and suitable for positioning racks and supports.

**CS1-1** (not in photo)

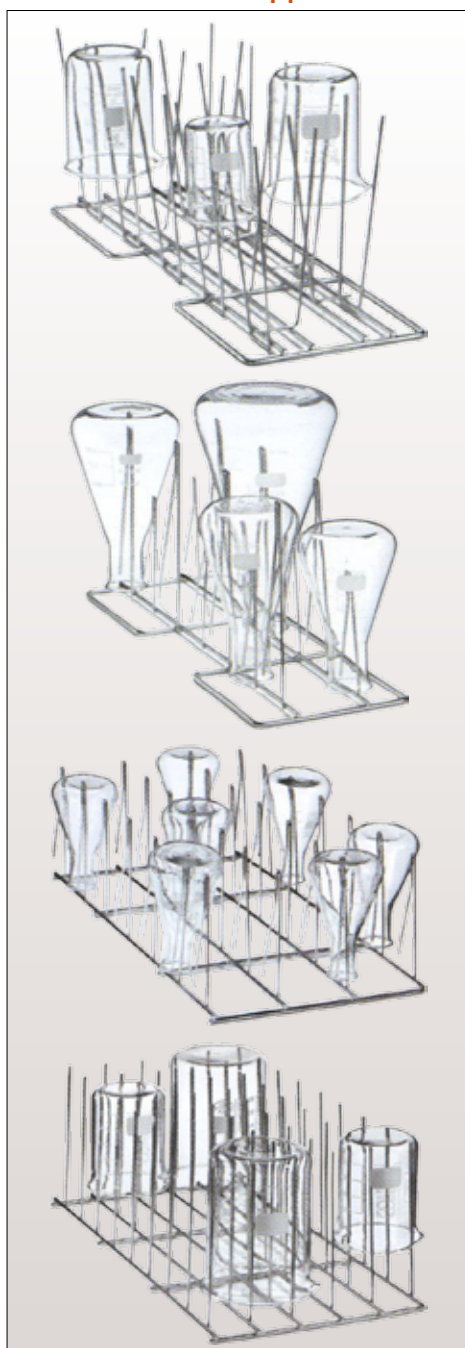
Upper carriage with sprayer. Made for stainless steel and suitable for positioning racks and supports.

**D-CS2** (only on WG-2045 model)

Lower carriage with sprayer. Made for stainless steel and suitable for positioning racks and supports.

**CS2** (not in photo)

Basic lower carriage. Made for stainless steel and suitable for positioning racks and supports.

**Flask and beaker supports****SB9** (only on WG-2045 model)

Stainless steel 9-position support for test tubes and breakers with max volume of 100ml. Occupies 1/2 of the D-CS1/D-CS2 carriages.

Dimensions: l x d x h = 420x145x160mm.

**SB14** (only on WG-2045 model)

Stainless steel 14-position support for beakers and flasks with volume of 250 to 1000ml. Occupies 1/2 of the D-CS1/D-CS2 carriages.

Dimensions: l x d x h = 422x146x184mm.

**SB15**

16-position spring support for flasks, beakers, etc. For use in combination with standard CS1-1/CS2 racks and LM20 carriage.

It has a capacity of 16 items and is made of stainless steel. Recommended for flasks with a capacity of up to 1000ml.

**SB28** (not in photo): 28-position spring support for flasks, beakers, etc. For use in combination with standard CS1-1/CS2 racks and LM20 carriage.

It has a capacity of 28 items and is made of stainless steel. Recommended for flasks with a capacity up to 1000ml.

**SB30**

30-position support to hold beakers of any size & to be used with the standard baskets CS1-1 & CS2 & the trolley LM20. It has a capacity of 30 items & is made of stainless steel. Recommended for beakers with a capacity smaller than 500 ml.

**SB25** (not shown in the photo): 28-position spring support to hold flasks and beakers and to be used with the standard baskets CS1-1 and CS2.

It has a capacity of 28 items and is made of stainless steel. Recommended for flasks with a capacity smaller than 500 ml.

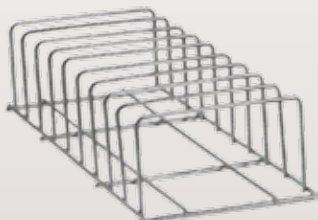
## Plate and slide supports/ Test tube supports

**PV105**

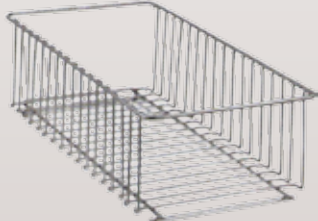
Microscope slide basket made of stainless steel.  
Suitable for positioning 105 standard microscope slides.  
Dimensions l x d x h = 220x143x60mm.

**SL6**

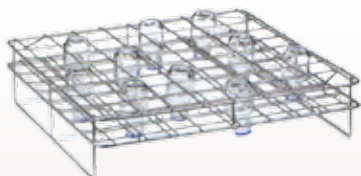
Olympus-type plate support for optical recognition of the blood unit.  
Suitable for positioning 6 plates.  
Hinged lid included.  
Dimensions l x d x h = 485x145x80 mm.

**SL9**

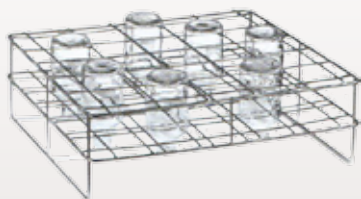
Universal support for chromatographic plates made of stainless steel.  
Capacity of 9 items. Suitable for positioning flat materials.  
It takes up 1/12 the space of a standard basket.

**SL18**

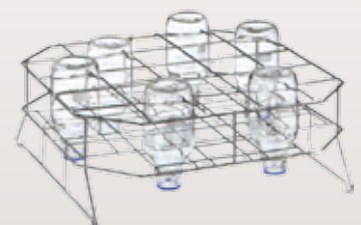
Support for standard 20x20 chromatographic plates.  
Capacity of 18 items.  
The guides are shewed in such a way that the support points are outside the working surface.

**PB50**

Support for 56 wide-necked bottles of 50ml (screw cap GL32 IS04796 or ground cap DIN 12038 or non-standard cap). Max bottle dimensions: dia. 46mm - H 87mm.



**PB100** for 32 wide-necked bottles of 100 ml. (screw cap GL45 IS04796 or ground cap DIN 12038 or non-standard cap). Max bottle dimensions: dia. 56mm - H 100mm

**PB250**

Support for 25 wide-necked bottles of 250 ml. (screw cap GL45 IS04796 or ground cap DIN 12038 or non-standard cap).  
Max bottle dimensions: dia. 70mm - H 138mm.

**PB500**

Support for 21 wide-necked bottles of 500 ml. (screw cap GL45 IS04796 or ground cap DIN 12038 or non-standard cap).  
Max bottle dimensions: dia. 86mm - H 176mm.

**PB1000**

Support for 16 wide-necked bottles of 1000 ml. (screw cap GL45 IS04796 or ground cap DIN 12038 or non-standard cap).  
Max bottle dimensions: dia. 101mm - H 225mm.

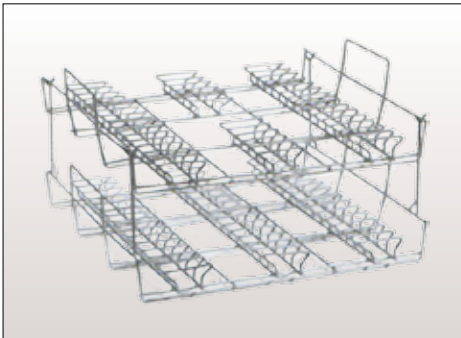
### Test tube supports



Additional accessory for the standard baskets CS 1 – 1 and CS2 and the trolley LM20 for washing analysis test tubes. It has a capacity of approximately 160 standard test tubes with 3 removable compartments and lid. It takes up a % of the space of a standard basket and is available in four standard sizes:

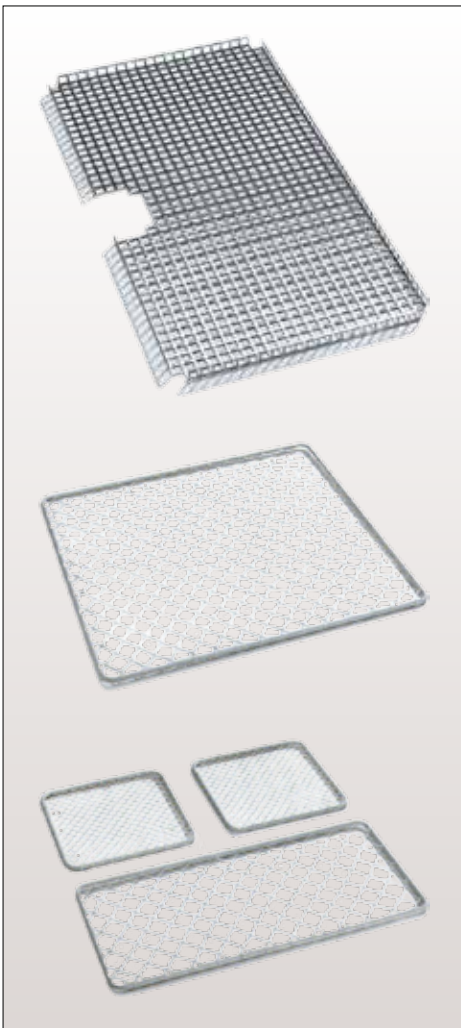
- CP105:** test tubes up to 75 mm in height
- CP132:** test tubes up to 105 mm in height
- CP192:** test tubes up to 165 mm in height
- CP222:** test tubes up to 200 mm in height.

### Petri dish supports



- PD70S:** 40 items, 50–70mm positioned on the upper level CS 1-1.
- PD100S:** 38 items, 70–120mm positioned on the upper level CS 1-1.
- PD70I:** 40 items, 50–70mm positioned on the upper level CS2.
- PD100I:** 38 items, 70–120mm positioned on the upper level CS2.

### Racks for small glassware, baskets and holding nets



**PF1/2:** Additional accessory for CS1-1 and CS2 racks made from flat AISI 304 stainless steel mesh with small mesh openings as a rack to hold small glass items or as rigid rack as an alternative to the Nylon holding nets. Available in 3 versions: PF1 (not shown in the photo) bottom rack with hole for positioning on the top level; PF2 (not shown in the photo) complete bottom rack for positioning on the bottom level only; PF1/2 (shown in the photo) half bottom rack for positioning on the upper level.

**D-PF1:** (only for WG-2045)

Full bottom rack for upper carriage, made from stainless steel 10x10 mesh with central hole, for positioning on the upper carriage D-CS1. Dimensions: l x d x h = 305x425x11mm

**D-PF2:** (only for WG-2045)

Full bottom rack for upper carriage, made from stainless steel 10x10 mesh with central hole, for positioning on the lower carriage D-CS1. Dimensions: l x d x h = 305x425x11mm.

**RC1:**

Holding nets with plastic-coated metal edges & Nylon ties to hold small glass items in place in the standard baskets CS1-1 and CS2; available in three models: RC1 fits in the whole basket, RC1/2 fits in half the basket, RC1/4 fits in a quarter of the basket.

**RC1/2 - RC1/4:**

Holding nets with plastic-coated metal edges & Nylon ties to hold small glass items in place in the standard baskets CS1-1 and CS2; available in three models: RC1 fits in the whole basket, RC1/2 fits in half the basket, RC1/4 fits in a quarter of the basket.

**Baskets**



**CPF1**

Complete bottom level basket with edging and handles. Made of flat stainless steel mesh with mesh openings of 10x10 mm. Dimensions l x d x h = 445x444x68 mm (height with handles 110 mm). Positioning on the lower trolley CS2.

**CPF1/2** (not shown in the photo): bottom level basket with edging and handles. Made of flat stainless steel mesh with mesh openings of 10x10 mm.

Dimensions l x d x h = 225x444x68 mm (height with handles 110 mm). It takes up Y2 the space of the lower trolley CS2.

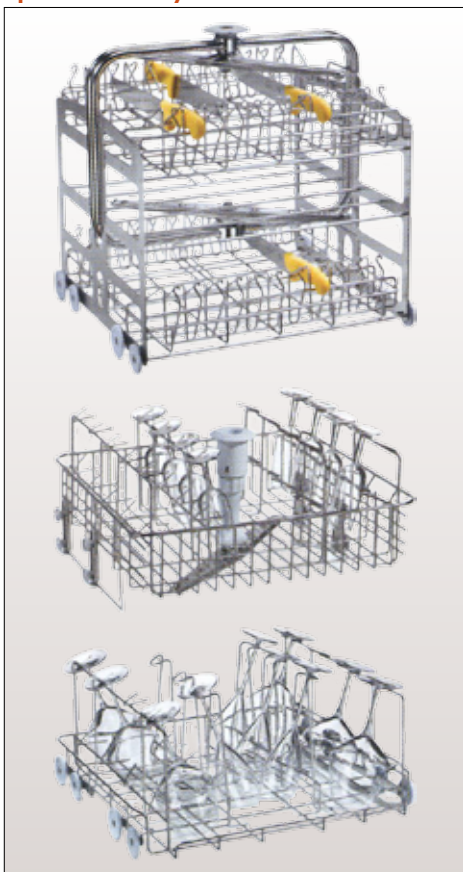
**CSK2**

Baskets with stainless steel handles, suitable for medium-sized instruments.

Mesh openings of 5x5mm.

Dimensions l x d x h = 450x225x50mm.

**Special trolleys**



**CSK-C**

Stainless steel trolley with 3 washing levels for butchery utensils available on request, suitable for positioning three SCL-23 knife and utensil holders. Upper levels with spraying arm incorporated. Lower level with sprayer at the bottom of the machine.

**CPB1**

Stainless steel upper trolley for wine-tasting glasses. Suitable for washing 14 wine-tasting glasses of max. 220mm in height.

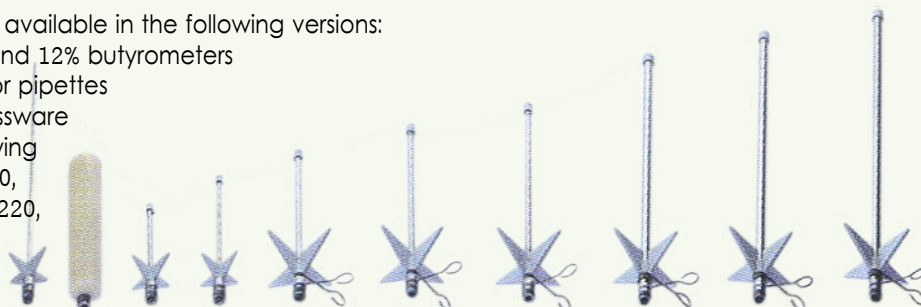
**CPB2**

Stainless steel lower trolley for wine-tasting glasses. Suitable for washing 14 wine-tasting glasses of max. 240mm in height.

**Spigots**

Injection spigots available in the following versions:

- spigot for 6% and 12% butyrometers
- Nylon spigot for pipettes
- Spigots for glassware with the following heights: 90, 110, 140, 160, 180, 220, 240, 260mm.



### Narrow-necked glassware injection carriages



#### **LMP24** (only for WG-2045 model)

Mixed stainless steel flask/pipette carriage with 12+12 positions, suitable for washing narrow-necked glassware up to 490 mm in height. Fitted with the following nozzles: 4 x U6240, 2 x U6220, 2 x U4160, 2 x U4140, 2 x U311 0, 12 x LB40. Maximum glassware height of 490 mm and positioning on the D-CS2 carriage lower level.

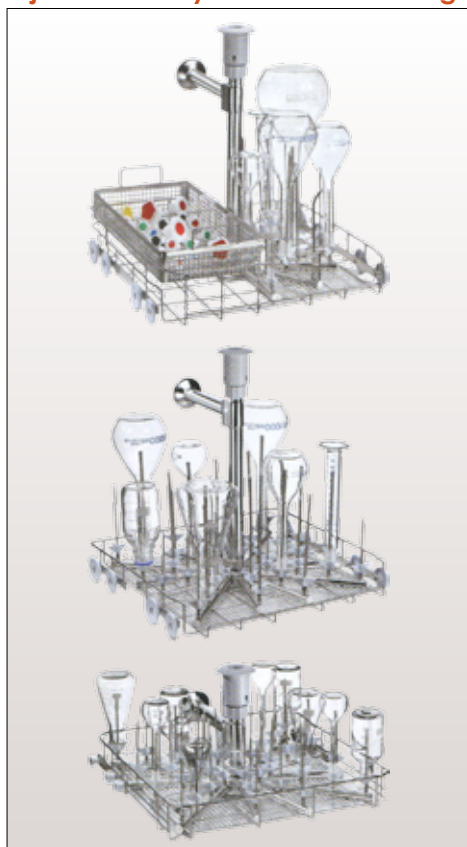
#### **LM24** (only for WG-2045 model)

Universal 24-position stainless steel flask washer, suitable for washing narrow-necked glassware up to 490 mm in height. Fitted with the following nozzles: 6 x U6240, 5 x U6220, 6 x U4160, 5 x U4140, 2 x U311 0. Positioning on the D-CS2 carriage lower level.

#### **LM22S** (only for WG-2045 model)

Universal 22-position stainless steel flask washer, suitable for washing narrow-necked glassware up to 225 mm in height. Fitted with the following nozzles: 12 x U4140, 5 x U311 0, 5 x U390, positioning on the D-CS1 carriage upper level.

### Injection trolleys narrow-necked glassware



#### **LM20DS**

20-position universal flask washing trolley in stainless steel with 20 spigots and drying system connection. Suitable for washing and drying narrow-necked glassware up to 490 mm in height. Half the trolley space is free for mixed glassware suitable for a Y2 basket accessory. Positioning on the lower level.

**LM20** (not shown in the photo):  
version without drying system connection.

#### **LM40DS**

40-position universal flask washing trolley in stainless steel with 40 spigots and drying system connection. Suitable for washing and drying narrow-necked glassware up to 490 mm in height, flasks, round-bottom flasks and graduated cylinders of various sizes. Positioning on the lower level.

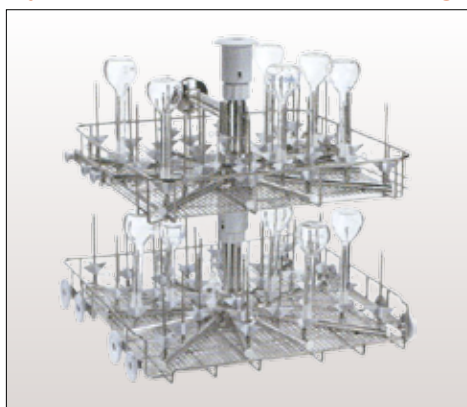
**LM40** (not shown in the photo):  
version without drying system connection.

#### **LM40SDS**

40-position flask washing trolley in stainless steel with forty U4140 spigots and drying system connection. Suitable for washing narrow-necked glassware up to 225 mm in height. Positioning on the upper level.

**LM40S** (not shown in the photo):  
version without drying system connection.



**Injection trolleys narrow-necked glassware (continuation)****LM80DS**

Two-level flask washing trolley with 68 U4140 spigots and 1 UC6 spigot & drying system connection. Suitable for internal injection washing of narrow-necked glassware with a maximum height of 225 mm. Positioning on two levels.

**LM80** (not shown in the photo):  
version without drying system connection.

**Reactor washing****LR4DS**

Stainless steel trolley with drying system connection. Suitable for inside washing and drying of 3/5-way reactors of maximum 3 Liters or up to 1.2 narrow-necked glass items. Fitted with 20 U6260 spigots. Positioning on the lower level.

**LR4** (not shown in the photo):  
version without drying system connection.

**Fischer bottle washing****LT20DS**

Stainless steel trolley with drying system connection for washing and drying of 12 Fischer bottles and graduated cylinders with a maximum height of 55 cm. 6 positions for injection washing of narrow-necked glassware. Fitted with 18 spigots. Positioning on the lower level.

**LT20** (not shown in the photo):  
version without drying system connection.

**Butyrometer washing****LB40DS**

Stainless steel trolley for butyrometer washing with drying system connection. Suitable for washing and drying of 40 butyrometers. Specify the type of butyrometer in the order. Positioning on the upper level.

**LB40** (not shown in the photo):  
version without drying system connection.

## Bottle washing

**LB4DS**

Stainless steel trolley for washing large glass items with drying system connection. Suitable for washing two 10-Liter bottles + two 5-Liter Schott-type bottles. Fitted with 8 special spigots. Positioning on the lower level.

**LB4** (not shown in the photo):  
version without drying system connection.

**LBT5DS**

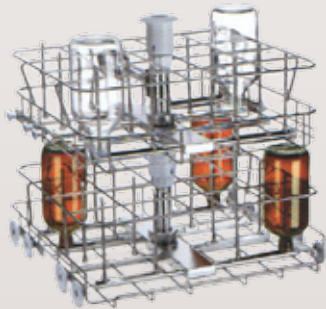
Stainless steel trolley for bottle washing with drying system connection. Suitable for washing and drying of five 5-Liter bottles (dia. 180 x h.500mm, max neck diameter 80 mm). Fitted with 5 special spigots. Positioning on the lower level.

**LBT5** (not shown in the photo):  
version without drying system connection: LBT5

**LB8DS**

Stainless steel trolley for washing large glass items with drying system connection. Suitable for washing 8 bottles of maximum 50 cm in height. Fitted with 8 U6260 spigots and 8 special spigots. Positioning on the lower level.

**LB8** (not shown in the photo):  
version without drying system connection.

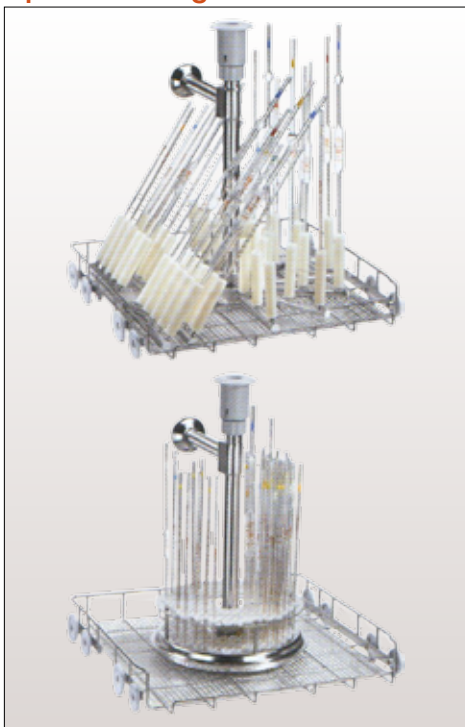
**LB32DS**

Two-level stainless steel trolley for injection washing of bottles with drying system connection. Suitable for washing 32 narrow- or wide-necked bottles of 250–1000ml, max. dia. 101 mm, H.245 mm. Fitted with 32 U6170 spigots. Positioning on 2 levels.

**LB32** (not shown in the photo):  
version without drying system connection.

**LB1-20DS**

Stainless steel trolley for washing universal large glass items with drying system connection. Positioning on lower level.

**Pipette washing****LPV40DS**

Stainless steel trolley for washing volumetric pipettes up to 55 cm in length. 20 positions for pipettes of 55 cm in height and 20 positions for pipettes and/or flasks of 45–49cm in height.

**LPV40** (not shown in the photo):  
version without drying system connection.

**LPT100DS**

Stainless steel pipette washing trolley with drying system connection for washing and drying of 100 pipettes with a capacity of 1 to 20ml.

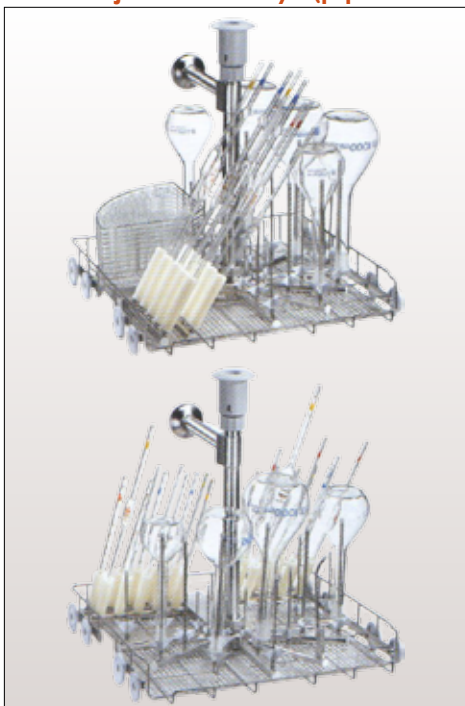
and a height up to 450mm. The pipette washing disc is fitted in a trolley to allow fast loading & unloading access.

**LPT100** (not shown in the photo):  
version without drying system connection.

**Vials and tapered centrifuge test tubes****KP200DS**

Trolley with drying system connection for washing of tapered and cylindrical test tubes by internal injection. It has a maximum capacity of 100 test tubes. Positioning on the upper washing level.

**KP200** (not shown in the photo):  
version without drying system connection.

**Mixed injection trolleys (pipettes + narrow neck)****LPM2010DS**

20-position stainless steel trolley with drying system connection for mixed washing of flasks, pipettes and test tubes. Suitable for washing and drying of 10 pipettes up to 55cm + 20 narrow-necked glass items + 1/4 free space to be filled with a CP Series test tube basket. Fitted with the following spigots: 2 x U6260, 2 x U6240, 2 x U6220, 3 x U4180, 2 x U4160, 2 x U4140, 3 x U311 0,4 x U390, 1 x UC6, 10 x ULB40 for pipettes with a maximum height of 55cm. Positioning on the lower level.

**LPM2010** (not shown in the photo):  
version without drying system connection.

**LPM2020DS**

Injection washing trolley with drying system connection for mixed washing of pipettes and flasks with 20 positions for pipettes up to 550mm in height and 20 positions for narrow-necked glassware with a maximum height of 49cm. Fitted with 38 spigots. Positioning on the lower level.

**LPM2020** (not shown in the photo):  
version without drying system connection.



The strong point of the WG-6090 washing system is that the direct injection systems can be exchanged with the rotating sprayer systems on all three washing levels. By placing the 6 available systems on different levels, many different configurations can be obtained, thus allowing loading capacity to be optimized according to washing requirements. Glassware of various sizes with heights up to 790mm and volumes up to 25 Liters can be washed.

	Direct Injection Systems	Max. Height of Glassware (mm)			Rotating Sprayer System	Max. Height of Glassware (mm)		
3° LEVEL	<b>C63_L690</b> Telescopic base injection system	130	390	130	<b>C62</b> Telescopic base with rotating sprayer	95	360	95
2° LEVEL	<b>C63_L680</b> Telescopic base injection system	180		510		<b>C62</b> Telescopic base with rotating sprayer		170
2° LEVEL	<b>C61_L685</b> Telescopic base with rotating sprayer	220	220				<b>C61</b> Telescopic base using the rotating sprayer at the bottom of the wash tank	390

### Three washing levels



#### Direct injection

Level 1 : C61 basic trolley with L685 direct injection system.  
Maximum useful height 260 mm 76 spigots.  
Level 2: C63 trolley with L680 direct injection system.  
Maximum useful height 210 mm 76 spigots.  
Level 3: C63 trolley with L690 direct injection system.  
Maximum useful height 170 mm 87 spigots.

#### Direct injection/rotating sprayers

Level 1 : C61 basic trolley with L685 direct injection system.  
Maximum useful height 325mm 76 spigots.  
Level 2: C62 upper trolley with rotating sprayer.  
Maximum useful height 150mm, useful washing surface 625x625mm.  
Level 3: C63 telescopic support with L690 direct injection system.  
Maximum useful height 170mm 76 spigots.

#### Rotating sprayers

Level 1 : C61 basic trolley. Maximum useful height 325mm.  
Level 2: C62 upper trolley with rotating sprayer.  
Maximum useful height 195mm.  
Level 3: C63 telescopic support with L690 direct injection system.  
Maximum useful height 105mm.  
Washing surface 625x625 (1.18m<sup>2</sup> total).

**Two washing levels****Direct injection**

Level 1 : C61 basic trolley with L680 direct injection system.  
Maximum useful height 260mm, 76 spigots.

Level 2: C63 telescopic support with L685 direct injection system.

Maximum useful height 440mm, 76 spigots.

**Direct injection and rotating sprayers**

Level 1: C61 basic trolley. Maximum useful height 330mm.

Level 2: C63 telescopic support with L685 direct injection system.

Maximum useful height 450mm, 76 spigots.

**Direct injection and rotating sprayers**

Level 1: C61 basic trolley with L680 direct injection system.

Maximum useful height 300mm 76 spigots.

Level 2: C62 upper trolley with rotating sprayer.

Maximum useful height 380mm.

**Rotating sprayers**

Level 1: C61 basic trolley. Maximum useful height 365mm.

Level 2: C62 telescopic base with rotating sprayer.

Maximum useful height 385mm.

Washing surface 625x625 (0.78m<sup>2</sup> total).

**Direct injection**

Level 1 : C61 basic trolley with L685 direct injection system.  
Maximum useful height 545mm 76 spigots.

Level 3: C63 telescopic support with L690 direct injection system.

Maximum useful height 170mm, 87 spigots.

**Direct injection/rotating sprayers**

Level 1 : C61 basic trolley. Maximum useful height 605mm.

Level 3: C63 telescopic support with L690 direct injection system.

Maximum useful height 170mm, 87 spigots.

### One washing level



#### Injection washing

Level 1 : C61 basic trolley with L685 direct injection system.  
Maximum useful height 720mm, 76 spigots.

#### Rotating sprayers

Level 1: C61 basic trolley.  
Maximum useful height 835mm.

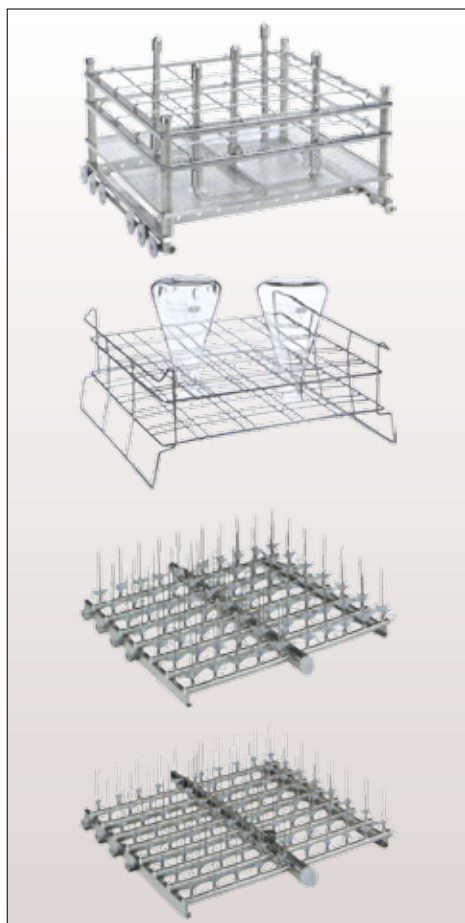
#### Direct injection

This special C64 trolley can be used to wash drums with heights up to 530mm and diameters up to 30 mm using spigots.

Trolleys can be developed for special applications on request.

Level 1 : C64 basic trolley.  
Maximum useful height 835mm.

### Accessories



#### LM6-10U

Stainless steel trolley for bottle washing with drying system connection.

Suitable for washing and drying large glasswares of different sizes.

#### PB6000

Support for wide-mouthed bottles. Capacity 25 flasks from 1000ml to 5000ml and/or 1000ml wide-mouthed bottles (screw cap GL45 IS04796 or ground cap DIN 12038 or non-standard cap). Made of stainless steel.

#### L685

Injection system for large, medium and small glassware with 76 spigots of differing heights:  
90/110/140/160/180/240mm.

The differing spigot heights make it possible to optimise loading of different sized glassware. This spigot configuration allows the system to be used on washing levels 1 and 2.

**L680** Injection system for small and medium glassware with 76 spigots at the same height of 140mm. This spigot configuration makes it suitable for preferential use on 2 work levels.

#### L690

Injection system for small glassware with 86 spigots at the same height of 110mm. This spigot configuration makes it suitable for use on the 3rd work level.



**C61**

Basic level 1 trolley with grid. It is used on its own and is suitable for positioning various glassware supports. Washing is performed by the internal sprayer at the bottom of the machine.

The C61 basic trolley is also used to position the injection systems (L685/L680/L690) on level 1. The injector trolleys are inserted into the guide rails of the C61.

**C63**

Telescopic support for injection systems. The support is used to position the injection systems on levels 2 and 3.

The C63 is inserted into guide rails of the machine.

The injector trolleys (L680/685/690) are inserted in turn into the guide rails of the C63. The system allows the injection systems to be completely removed in order to simplify loading the glassware.

**C62**

Basic trolley with rotating sprayer for levels 2 and 3. It is used on its own and is suitable for positioning glassware supports.

The system is divided into 2 parts:

1. Base with sprayer
2. Telescopic support with top.

**Detergents & Additives**

To achieve excellent washing results and optimize the thermal disinfection of laboratory instruments, specific detergents should be used. MRC has a complete range of alkaline detergents (for use during the washing phase) and neutralizing acid detergents (for use during the neutralization phase) especially designed to guarantee efficient cleaning and optimize the efficiency of the final thermal disinfection phase. MRC also has numerous disinfectants designed for thermolabile instruments and anaesthesia tools for use in the machine during the thermo chemical cycle, as well as special lubricants and additive that can lengthen the lifetime of the medical devices.

**Powder alkaline detergents**

**Deterglass**  
Universal powdered alkaline detergent. 10kg pack.

**Deterglass SP**  
Universal powdered alkaline detergent, phosphate-free. 10kg pack.

**Liquid alkaline detergents**

**Deterliquid D**  
Liquid alkaline detergent. 10 Liter container.

**Deterliquid D2**  
Liquid alkaline detergent, phosphate-free. 5 Liter container.

**Deterliquid SP**  
Liquid alkaline detergent for water & pharmaceutical analysis, phosphate-free. 5 Liter container.

**Liquid acid neutralisers**

**Acidglass P**  
Liquid acid neutralizer for laboratory glassware. 5 Liter container.

**Acidglass P2**  
Liquid acid neutralizer for laboratory glassware. 5 Liter container.

**Acidglass C2**  
Neutralizing acid detergent. 5 Liter container, phosphate-free.

**Special additives**

**Dry clean**  
Special additive for promoting drying. after the rinse phases. 5 Liter container.

**F1S**  
Silicon defoaming additive for petrol cycles, phosphate-free. 1 Liter container.

### Water Treatment

To obtain high quality washing standards, it is fundamentally important to use correctly treated water. In the prewash, washing and neutralization phases, softened water should always be used. Models WG-2045, WG-1060, WG-4060, WG-3060 and WG-4090 range have an efficient built-in decalcifier capable of reducing the hardness of the supply water so as to prevent the classic formation of whitish stains inside the chamber and on the instruments.

MRC also supplies a range of high-performance WS water softeners which are compact and easy to install. Equally important is the rinsing of the instruments with demineralized water in order to eliminate any contaminants remaining in the washing chamber. For this purpose, MRC has the compact and efficient WP3000 mixed resin bed demineralizer.



#### WP3000

##### Resin column water purifier

The WP3000 water purifier is used to produce deionised water at 0.8–1µS/cm, suitable for the final rinsing of instrument washers. The system uses mixed bed resins (disposable) which can also retain silica. When the resins run out, they can simply be replaced with the MI700WP kit. The resin cartridge is made out of stainless steel, as is the entire machine.

Net capacity of cartridge: 15Liters.  
Dimensions: l x d x h = 300x600x850mm.

**MI700WP** Anion/cation mixed bed resins kit for the WP3000 water purifier. Total exchange capacity 42700 Liters/°F# end of cycle at 5µS/cm ("Hardness in French degrees). Supplied with used resin disposal bag.



#### WS9E, WS11E, WS14E, WS17E

##### Water treatment systems

The WSE Series of appliances are technological water softeners capable of completely eliminating lime from water.

The resins are regenerated using normal sodium chloride. Available in versions with flow rates of up to 2700 Liters/hour. The models are fitted with an electronically controlled head which can be programmed depending on the hardness of the water. They provide backflow regeneration based on the volume of water (bearing in mind the resin saturation rate) and proportional brine in order to optimize water and salt consumption.

Model	WS9E	WS11E	WS14E	WS17E
Maximum flow rate	1600 l/h (16.7 l/h)	1800 l/h (43 l/h)	2000 l/h (43 l/h)	2200 l/h (43 l/h)
Nominal flow rate	1000 l/h (16.7 l/h)	1500 l/h (43 l/h)	1600 l/h (43 l/h)	1800 l/h (43 l/h)
Resin capacity in litres	9	11	14	17
Exchange capacity (m <sup>3</sup> /°f)	54	66	84	102
Cycle capacity at 4°f	1350	1650	2250	2700
Programmable residual hardness	0–10°f			
Regenerating agent type	NaCl Salt			
Regenerating agent consumption	0.9 kg/cycle	1.0 kg/cycle	1.2 kg/cycle	1.8 kg/cycle
Dimensions ØxH (mm)	300x470x540	300x470x660	300x470x815	300x470x1070
Salt tank dimensions L x P x H (mm)	Integrated			
Capacity litres (SALT)	About 15	About 20	About 30	About 40
Connections	1#			



**PROGRAMMABLE:**

The heart of the new generation of MRC disinfectors is the leading-edge management system controlled by microprocessors which can control at all the activities performed & monitor, using redundant systems, the entire flow of information processed by the equipment. The entire WG Series allows operators to programme all washing parameters as they prefer, using the multi-function membrane keypad or the PC directly via the RS232 or LAN connections & the WD-TRACE software ®. All significant parameters can be set. These include: execution times, operating temp., quantity of additives, number of phases, and so on. Access to the control operations is protected by a system of four user passwords.

**DRYING SYSTEM:**

The forced-air "Drying System", completely modified in the new WG Series, is a high-performance rapid drying system. The system, comprising an efficient hot air generator & a powerful fan, is directly managed by the programmer which allows both operating time and temperature parameters to be modified. The microprocessor assures "intelligent" management of the drying circuit by automatically adjusting fan speed (thereby reducing power consumption) according to the temperature measured in the washing chamber. The air intake passes through a class C filter with a 98% efficiency rating.

**PERISTALTIC PUMPS DETERGENT AND NEUTRALIZER:**

Disinfection effectiveness mainly depends on the correct performance of the washing phases and the neutralization of the treated material. Models WG-3060 and WG-4090 feature two peristaltic pumps dedicated to dispensing the alkaline detergent during the cleaning phase and the acid neutralizer during the neutralization phase respectively. Each pump is equipped with a level sensor to be positioned directly in the can of the products used. About the models WG-2045, WG-1060 e WG-4060, it is possible to install a specific optional pump to dispensing the alkaline detergent.

**ADDITIONAL PERISTALTIC PUMPS FOR ADDITIVES:**

The new WG models can have up to two additional peristaltic pumps dedicated to dispensing additives (caustic soda, defoamers, inhibitors, disinfectants). Each pump is equipped with a level sensor to be positioned directly in the can of the products used. system of four user passwords.

**DETERGENT STORE:**

Ergonomics, reduced dimensions and practicality are indispensable requirements for all equipment used in busy professional surroundings. With these requirements in mind, MRC has designed a detergent store located inside the reduced dimension of the glassware washer itself. It can contain up to four 2-Liter containers for the WG-4090 Series and four 5-Liter containers for the WG-6090 Series. No product feed pipes project from the volume of the glassware washer.

**LAN CONNECTION:**

Thanks to the dedicated MRC WD-TRACE software ® it is possible to visualise each piece of equipment as though it were a terminal, thus being able to store all the machine data directly on PC. As information communication is two-way, it is possible to directly dialogue with the disinfectant microprocessors, for example, in order to change the cycle parameters or display a chart of internal temperatures.

**PRINTER:**

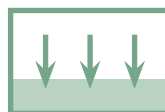
The traceability of the washing and thermal disinfection cycles performed in professional glassware washers is required in order to check the operations have been successfully completed. The printer is an accessory which can provide a detailed report containing all information relative to cycle performance. In both the free-standing and panel versions, the thermal printers used in the WG Series provide complete supporting documentation for operators.

**CONNECTION RS232:**

A significant feature of the new-generation equipment is that it incorporates the devices required for the complete communication of data relative to completed processes. The range of last-generation WG features two standard RS232 outputs, one for connection with the printer and the other for connection with the PC in order to download all the information relative to completed washing and disinfection programmes.

**THE PARAMETER Ao:**

Is a numerical value deriving from an equation that directly relates two fundamental parameters: temperature and thermal disinfection time. Basically, the value of Ao defines the level of lethality of the process expressed in seconds. The value appears directly on the display and, if a printer is installed, it is also included in the end-of-cycle report.

**STEAM CONDENSER:**

The steam condenser rapidly reduces the saturated steam from the washing water, especially during the thermal disinfection phases. This device eliminates the formation of condensation near the glassware washer and prevents humidity and smells from escaping into the air, especially in the versions positioned underneath worktops. In air-conditioned rooms moreover, limiting the dispersion of heat from the glassware washer reduces the work load of the air-conditioning system, considerably decreasing electricity consumption and unwanted temperature changes.



PL-600

### PL-600, Bench Top pH mV/Temp/Meter, Complete Kit

- Microprocessor based designed. Simultaneous display pH & Temperature, C/F switchable.
- Compensation by ATC or MTC. Backlight for operating conveniently anytime.
- Stores up to 64 readings which you can download to your computer via R232 output.
- All reading feature stamp meeting GLP guidelines.
- pH electrode (glass, GL-42)
- Temperature probe (Pt 100)
- Electrode holder.
- Buffer solution 4 & 7
- AC/DC adaptor
- Instruction manual, Gift box.

**Option:** Model: PL-700 magnetic stirrer with clamp for holding ph electrode & temp. probe.

Model	PL-600		
	pH	mV	Temp.
<b>Range</b>	0-14pH	-2000 - (+2000)	-0.5 - 105°C
<b>Accuracy</b>	±0.01pH+1digit	0.1% mV/F.S	±0.2°C+1digit
<b>Resolution</b>	0.01pH	1mV	0.1°C
<b>ATC</b>	0-100°C		
<b>Memory data logging</b>	64 reading		
<b>Output</b>	RS-232		
<b>Power</b>	DC 9V by AC adapter		
<b>Dimensions</b>	200x160x65mm		
<b>Weight</b>	650g		



### WA-2017SD, pH/ORP, DO, CD/TDS, Salt, SD Card, Real time Data logger, Water Quality, Patent

- One meter for multi purpose operation: PH/ORP, CD/TDS, Dissolved Oxygen, Salt measurement. • pH: 0 to 14.00 pH, ORP: ± 1999 mV.
- Conductivity: 200 uS/2 mS/20 mS/200 mS. • Dissolved oxygen: 0 to 20.0 mg/L. • Salt: 0 to 12 % salt (% weight). • Optional PH, ORP, CD/TDS/Salt, Dissolved Oxygen and ATC probe. • DC 1.5V (UM-3, AA) x 6 PCs or DC 9V adapter in. • PH meter function can select PH or ORP. • PH measurement can select ATC or manual temperature adjustment. • PH measurement can make the auto calibration for pH 7, pH 4 and pH 10 or other value.
- Conductivity measurement can select uS/mS or TDS • Conductivity measurement can select Temp. Coefficient of measurement solution.
- ATC for the conductivity measurement. • Dissolved use the polar graphic type oxygen probe with temperature sensor, high precision measurement for Dissolved Oxygen (DO) and temperature measurement. • Heavy duty dissolved oxygen probe, probe head can connect with BOD bottle. • DO use the automatic Temp. compensation. • DO meter build in "% SALT" & "Mountain Height" compensation value adjustment. • Separate probe, easy

for operation of different measurement environment. • Wide applications: water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, school & college, water conditioning. • Real time SD memory card Datalogger, it Built-in Clock and Calendar, real time data recorder, sampling time set from 1 sec to 8 hour 59 min. 59 sec. • Manual datalogger is available (set the sampling time to 0), during execute the manual datalogger function, it can set the different position (location) No. (position 1 to position 99). • Innovation and easy operation, computer is not need to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can down load the all the measured value with the time information (year/month/date/ hour/minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves. • SD card capacity: 1 GB to 16 GB.

- LCD with green light backlight, easy reading. • Can default auto power off or manual power off. • Data hold, record max. and min. reading. • Microcomputer circuit, high accuracy. • Power by UM3/AA (1.5 V) x 6 batteries or DC 9V adapter. • RS232/USB PC COMPUTER interface.

<b>Model</b>	<b>WA-2017SD</b>	
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.	
<b>Display</b>	LCD size : 52 mm x 38 mm LCD with green backlight ( ON/OFF ).	
<b>Measurement</b>	PH/ORP, Conductivity/TDS(Total Dissolved Solids), Dissolved Oxygen, Salt	
<b>Datalogger Sampling Time Setting range</b>	Auto	1 sec to 8 hour 59 min. 59 sec. @ Sampling time can set to 1 second, but memory data may loss.
	Manual	Push the data logger button once will save data one time. @ Set the sampling time to 0 second. @ Manual mode, can also select the 1 - 99 position (Location) no.
<b>Memory Card</b>	SD memory card. 1 GB to 16 GB.	
<b>Advanced setting @ main setting</b>	* SD memory card Format * Set clock time * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Set temperature unit to °C or °F * Set DO salt% compensation value * Set DO height ( meter ) compensation value * Set DO height (feet) compensation value * Set CD temperature compensation factor * Set CD to TDS or TDS to CD, CD only * Set pH manual Temp. compensation value	
<b>Data Hold</b>	Freeze the display reading	
<b>Memory Recall</b>	Maximum & Minimum value	
<b>Sampling Time of Display</b>	Approx. 1 second	
<b>Data Output</b>	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
<b>Power Supply</b>	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent	
	* DC 9V adapter input. (AC/DC power adapter is optional)	
<b>Power Current</b>	Normal operation (w/o SD card save data and LCD Backlight is OFF): Approx. DC 14 mA	
	When SD card save the data and LCD Backlight is OFF): Approx. DC 37 mA	
	* If LCD backlight on, the power consumption will increase approx. 12 mA	
<b>Operating Temperature</b>	0 to 50°C (32 to 122°F)	
<b>Operating Humidity</b>	Less than 85% R.H.	
<b>Weight</b>	489 g/1.08 LB.	
<b>Dimension</b>	177 x 68 x 45 mm, (7.0 x 2.7x 1.9 inch)	
<b>Accessories Included</b>	* Instruction manual: 1PC * Hard carrying case, CA-06: 1PC * Conductivity/TDS probe, Salt probe CDPB-03: 1PC	
<b>Optional Accessories</b>	* PH electrode: PE-03, PE-11, PE-01, PE-06HD, PE-04HD, PE-05T, PE-03K7 * ATC (Automatic Temperature Probe): TP-07, * pH 7 buffer solution: PH-07, * pH 4 buffer solution PH-04 * Conductivity/TDS probe, Salt probe CDPB-03 * 1.413 mS Conductivity Standard Solution CD-14 * Oxygen probe OXPB-11 * Spare Probe head with Diaphragm set OXHD-04 * Probe-filling Electrolyte OXEL-03 * ORP Electrode ORP-14 * SD memory card ( 1 GB ) * SD memory card ( 2 GB ) * AC to DC 9V adapter. * USB cable, USB-01. * RS232 cable, UPCB-02. * Data Acquisition software,SW-U801-WIN.	

**Electrical Specifications (23±5°C):**

**PH/mV**

<b>PH Electrode</b>	Optional, Any PH electrode with BNC connector.	
<b>Measurement</b>	<b>PH</b>	0 to 14 PH
	<b>mV</b>	-1999 mV to 1999 mV
<b>Input Impedance</b>	<b>10<sup>12</sup> ohm</b>	
<b>Temperature Compensation for pH measurement</b>	<b>Manual</b>	0 to 100°C, be adjusted by push button on front panel.
	<b>Automatic (ATC)</b>	With the optional temperature probe ( TP-07 ) 0 to 65°C.
<b>pH Calibration</b>	PH7, PH4, and PH10, 3 points calibration ensure the best linearity and accuracy.	
<b>Optional probe and accessories</b>	* PH electrode PE-03, PE-11, PE-01, PE06HD, PE-04HD, PE-05T, PE-03K7 * ATC (automatic temperature probe) TP-07 * pH 7 buffer solution PH-07 * pH 4 buffer solution PH-04 * ORP electrode ORP-14	

Measurement	Range	Resolution	Accuracy
<b>PH</b>	0 to 14 PH	0.01 PH	±(0.02 PH+2d)
<b>mV</b>	0 to 1999 mV	1 mV	±(0.5%+2d)
* PH accuracy is based on calibrated meter only.			

# WATER QUALITY PH/ORP/DO/CD/TDS/Salt, Data Logger

## Conductivity

<b>Conductivity probe</b>	Optional, Carbon rod electrode for long life.
<b>Function</b>	* Conductivity (uS, mS) * TDS (Total Dissolved Solids, PPM) * Temperature (°C, °F)
<b>Temperature Compensation</b>	Automatic from 0 to 60 °C (32 - 140 °F), with temperature compensation factor variable between 0 to 5.0% per C.
<b>Probe Operating Temp.</b>	0 to 60 °C
<b>Probe Dimension</b>	Round, 22 mm Dia. x 120 mm length.
<b>Optional probe &amp; accessories</b>	* Conductivity probe CDPB-03 * 1.413 mS Conductivity Standard Solution CD-14

## Conductivity (uS, mS)

Range	Measurement	Resolution	Accuracy
200 uS	0 to 200.0 uS	0.1 uS	±(2% F.S.+1d) * F.S. - full scale
2 mS	0.2 to 2.000 mS	0.001 mS	
20 mS	2 to 20.00 mS	0.01 mS	
200 mS	20 to 200.0 mS	0.1 mS	

\* Temperature Compensation: Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C. \* The accuracy is specified under measurement value ≤ 100 mS. \* mS - milli Simens \* @ 23± 5°C

## TDS (Total Dissolved Solids)

Range	Measurement	Resolution	Accuracy
200 PPM	0 to 132 PPM	0.1 PPM	±(2% F.S.+1d) * F.S. - full scale
2,000 PPM	132 to 1,320 PPM	1 PPM	
20,000 PPM	1,320 to 13,200 PPM	10 PPM	
200,000 PPM	13,200 to 132,000 PPM	100 PPM	

\* Temperature Compensation: Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C. \* The accuracy is specified under measurement value ≤ 100 mS. \* mS - milli Simens \* @ 23±5°C

## Temperature

Function	Measuring Range	Resolution	Accuracy
°C	0°C to 60°C	0.1 °C	± 0.8 °C
°F	0°F to 140°F	0.1 °F	± 1.5 °F

@ 23± 5°C

## Salt

<b>Conductivity probe</b>	Optional, Carbon rod electrode for long life.
<b>Measurement Range/Resolution</b>	0 to 12 % salt (% weight) / 0.01 % salt.
<b>Accuracy</b>	0.5 % salt value * F.S.: full scale.
<b>Temperature Compensation</b>	Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C.
<b>Probe Dimension</b>	Round, 22 mm Dia. x 120 mm length.
<b>Optional probe &amp; accessories</b>	* Salt probe (Conductivity probe) CDPB-03

## Dissolved oxygen

<b>Oxygen Probe</b>	Optional, The polarographic type oxygen probe with	
<b>Measurement &amp; Range</b>	<b>Dissolved Oxygen</b>	0 to 20.0 mg/L (liter).
	<b>Oxygen in Air</b>	0 to 100.0 %.
	<b>Temperature</b>	0 to 50 °C.
<b>Resolution</b>	<b>Dissolved Oxygen</b>	0.1 mg/L.
	<b>Oxygen in Air</b>	0.1 % O <sub>2</sub> .
	<b>Temperature</b>	0.1 °C.
<b>Accuracy (23± 5 °C)</b>	<b>Dissolved Oxygen</b>	± 0.4 mg/L.
	<b>Oxygen in Air</b>	± 0.7% O <sub>2</sub> .
	<b>Temperature</b>	± 0.8 °C/1.5 °F.
<b>Probe Compensation &amp; Adj.</b>	<b>Temperature</b>	0 to 50 °C, Automatic
	<b>Salt</b>	0 to 50 % Salt
	<b>Height ( M. T.)</b>	0 to 8900 meter
<b>Probe Weight</b>	335 g/0.74 LB ( batteries & probe included )	
<b>Probe Size</b>	190 mm x 28 mm Dia. ( 7.5" x 1.1" Dia. )	
<b>Optional Accessories</b>	* Oxygen probe OXPB-11 * Spare Probe head with Diaphragm set OXHD-04 * Probe-filling Electrolyte OXEL-03	



MP-103

### MP-103, PH/MV/Temp. Meter

**Features:** Microprocessor based with splash proof housing. Rubber protective holster with magnetic • Simultaneous display pH and Temperature • Simple to calibrate by one keyboard for 3 points buffer. Calibration value can be adjusted as needed • Compensation by ATC or MTC. Indicate percentage of slope(PTS) after calibration • Low battery & consumption indicator. Auto shut off after 10 minutes of non use.

**Accessories:** Buffer solution 4 & 7 • 9V Battery • Electrode holder • Instruction manual • Gift box • pH electrode with Pt 100.

	pH	mV	Temp.
<b>Range</b>	0-14.00	±1999	0-100°C
<b>Accuracy</b>	±0.01+1 digit	±1mV+1 digit	±0.2°C+1 digit
<b>Resolution</b>	0.01	1	0.1°C
<b>Compensation</b>	ATC:0-100°C		
<b>Calibration</b>	pH 4.00, 7.00, 10.00		
<b>Battery</b>	9V		
<b>Dimensions</b>	108 x 75 x 30 mm		
<b>Weight</b>	135g (with battery)		



PH-207

### PH-207, PH/MV/Temp. Meter

**Features:** Multi-measurement : pH, mV, Temperature • Dual display, show the pH & Temp. value at the same LCD display • High input impedance • Wide automatic & manual temperature compensation range • With the optional temp. probe for temp. compensation automatically or temperature measurement • The instrument build in mV (millivolt) measuring function, useful for making ion-selective, ORP, and other precise mV measurement • Built in Slope (PH 4) & Cal. (PH 7) calibration VR on the front panel, easy for single point or 2 points pH calibration • Heavy duty & compact housing case • Records Maximum, Minimum & Average readings with recall • Data hold • RS 232 PC serial interface.

<b>Display</b>	Dual function meter's display, 13mm(0.5"), Super large LCD display with contrast adjustment for best viewing angle
<b>Data Hold</b>	To hold the reading values on display
<b>Memory Recall</b>	Records Max., Min. & Average readings with RECALL
<b>Power off</b>	Auto shut off saves battery life, or manual off by push button
<b>Data Output</b>	RS232 PC serial Interface
<b>Standard Accessories</b>	Carrying case, pH electrode, PE-01, ATC temp. probe, TP-07 PH 4 buffer solution, PH-04. PH 7 buffer solution, PH-07

Measurement	Range	Resolution	Accuracy
<b>PH</b>	0 to 14PH	0.01PH	±(0.03PH+2d)
<b>mV</b>	0 to 1999mV	1mV	±(0.5%+1d)
<b>Temp. (°C)</b>	0 to 65°C	0.1°C	±1°C(0-50°C) ±4°C(>50°C)
<b>Temp. (°F)</b>	32 to 150°F	0.1°F	±1.8°F(32-122°F) ±7.2°F(>122°F)



PH100

### PH100, ExStik® PH Meters

Flat Surface electrode provides on-the-spot pH measurements

- RENEW feature tells you when it's time to replace your pH electrode
- CAL feature tells you when it's time to recalibrate your meter
- Flat Surface pH electrode rugged design measures pH on solid and semi-solid surfaces
- Analog bargraph originates at neutral point (pH 7.00) to view trends in acidity or alkalinity
- 1, 2 or 3 point calibration (order pH buffers separately)
- ATC plus measures Temperature
- Memory stores 15 labeled data
- Waterproof to IP57 protects meter from wet environment
- Includes fl at surface pH electrode, sensor cap, sample cup with cap, four 3V CR2032 button batteries and 48" (1.2m) neckstrap.

Model	PH100
<b>pH</b>	0.00 to 14.00pH
<b>Temperature</b>	23° to 194°F (-5 to 90°C)
<b>Max. Resolution</b>	0.01pH, 0.1°
<b>Basic Accuracy</b>	±0.01pH, ±1.8°F/1°C
<b>Dimensions</b>	1.4x6.8x1.6" (35.6x172.7x40.6mm)
<b>Weight</b>	3.8oz (110g)
<b>Warranty</b>	1yr (meter)/6mo conditional warranty (electrode)

## pH Electrodes



### PE-01 - Plastic

Rugged, polycarbonate construction features glass pH sensing bulb surrounded by protective teeth. pH range (0-14pH).

- Professional, laboratory & field usage.
- Size: 130x9.5mm.
- Epoxy body.



### GL42 - Glass

- Range: 0-14pH.
- Temp. 0-90°C.
- Ceramic Junction Glass body.
- 0 - 14 pH.
- BNC Connector.
- Size: 155x12mm.
- Cable: 1m.



### PE-08 - Flat Glass Surface

- Professional plane pH electrode, application for Laboratory, high quality & field usage, such as skin and food.
- Size: 137.5x15mm.
- Glass body.
- BNC Connector.
- 0 - 14 pH.



### PF47 - Flat Surface

Flat surface electrode (Easy to clean). PVC bodied electrode, ideal for pH of solid products with minimal moisture like cheese, soils or electrophoretic/agar gels creams. pH range (0 to 14pH), operating temperature (5 to 80°C).

- Cricoid Teflon Junction PVC body.
- Size: 106x15mm.
- BNC Connector.
- Cable: 1m.



### PE-06HD - Pierce

**Features:** The "Spear Tip pH electrode" is perfect for those pH measurements in applications where sample piercing is required. Meat, sausage and cheese are ideal applications. The electrode features a very durable glass measuring spear packaged in a rugged virtually unbreakable epoxy body.

- Size: 160x12mm, Cable: 1m.
- Weight: 68g (including cable & socket).
- Response time: ≤2 minutes.
- Epoxy body.
- BNC Connector.
- 1 - 13 pH, 5°C - 60°C
- Combination type, Ag/AgCl, Double Junction
- pH value of zero mV: 7± 1 pH.
- Repeatability: ≥0.05 pH.
- Mechanical Protection: With protection bottle on the electrode head.



## YK-23RP+ORP-14, ORP Meter+Electrode

**Applications:** Use for oxidation/reduction measurement in plating baths, waste water monitoring and other applications such as Aquarium, Beverage, Fish Hatcheries, Food Processing, Photography, Laboratory, Quality Control, School & Colleges and Swimming Pools.

Model	YK-23RP
<b>Features</b>	Easy operation, compact size. Water resistance on the front panel. All function keys are used the rubber button.
<b>Display</b>	LCD, 21.5 mm ( 0.7" ) digit height
<b>Range</b>	-1,999 mV to +1,999 mV
<b>Resolution</b>	1 mV
<b>Accuracy</b>	± (0.8 % + 1d) @ 23 ± 5°C
<b>Data Hold</b>	To freeze the measured pH value on the display
<b>Power Supply</b>	DC 9V battery
<b>Dimensions</b>	205x68x30mm (8.1x2.7x1.2inch)
<b>Weight</b>	200 g/0.44 LB

Model	ORP-14
<b>Features</b>	Professional ORP electrode with high accuracy & extreme reliability
<b>Electrode Structure</b>	Silver-silver/chloride reference gel
<b>Measure Range</b>	-2,000 to 2,000 mV
<b>Body Material</b>	Epoxy
<b>Connector</b>	BNC
<b>Mechanical Protection</b>	With protection bottle on the electrode head
<b>Dimensions</b>	Body length - 150mm. Body Dia. - 12.5mm. Cable length - 3meter.



**PH-230SD, PH meter, SD Card, Real time Datalogger, Patent + ORP**

- pH : 0 to 14.00 pH, mV (ORP) : ± 1999 mV.
- pH measurement can select ATC or manual Temp. adj.
- Optional ATC probe for pH measurement.
- pH measurement can make the auto calibration for pH 7, pH 4 and pH 10 or other value.
- Real time SD memory card Datalogger, it Built-in Clock and Calendar, sampling time set from 1 sec to 8 hour 59 min. 59 sec.
- Manual datalogger is available (set the sampling time to 0), during execute the manual datalogger function, it can set the different position (location) No. (position 1 to position 99).
- Innovation and easy operation, computer is not need to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can down load the all the measured value with the time information (year/month/date/hour/minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves.
- SD card capacity : 1 GB to 16 GB.
- LCD with green light backlight, easy reading.
- Can default auto power off or manual power off.
- Data hold, record max. and min. reading.
- Microcomputer circuit, high accuracy.
- Power by UM3/AA (1.5V) x 6 batteries or DC 9V adapter.
- RS232/USB PC COMPUTER interface.
- Wide applications: water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, school & college, water conditioning.

<b>Model</b>	<b>PH-230SD</b>	
<b>Circuit</b>	Custom one-chip of microprocessor LSI circuit.	
<b>Display</b>	LCD size : 52 mm x 38 mm LCD with green backlight ( ON/OFF ).	
<b>Measurement Function</b>	pH, ORP (mV)	
<b>Datalogger Sampling Time Setting range</b>	Auto	1 sec to 8 hour 59 min. 59 sec. @ For anemometer measurement, the sampling time setting value should be ≥ 2 seconds. @ Sampling time can set to 1 second, but memory data may loss.
	Manual	Push the datalogger button once will save data one time. @ Set the sampling time to 0 second. @ Manual mode, can also select the 1 – 99 position (Location) no.
<b>Memory Card</b>	SD memory card. 1 GB to 16 GB.	
<b>Advanced setting</b>	* SD memory card Format * Set clock time ( Year/Month/Date, Hour/Minute/ Second ) * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Set temperature unit to °C or °F * Set pH manual Temp. compensation value	
<b>Data Hold</b>	Freeze the display reading	
<b>Memory Recall</b>	Maximum & Minimum value	
<b>Sampling Time of Display</b>	Approx. 1 second	
<b>Data Output</b>	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
<b>Power Supply</b>	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent	
	* DC 9V adapter input. (AC/DC power adapter is optional)	
<b>Power Current</b>	Normal operation ( w/o SD card save data and LCD Backlight is OFF ) : Approx. DC 15 mA.	
	When SD card save the data and LCD Backlight is OFF ) : Approx. DC 37 mA.	
<b>Operating Temperature</b>	0 to 50°C	
<b>Operating Humidity</b>	Less than 85% R.H.	
<b>Weight</b>	489 g/1.08 LB.	
<b>Dimension</b>	177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch)	
<b>Accessories Included</b>	* Instruction manual: 1PC	
<b>Optional Accessories</b>	* PH electrode PE-03, PE-11, PE-01, PE-02, PE-07, PE-06HD, PE-04HD, PE-05T, PE-03K7 * ATC Temp. probe TP-07 * pH 7 buffer solution PH-07 * pH 4 buffer solution PH-04 * ORP Electrode ORP-14 * Hard carrying case CA-06 * Soft carrying case CA-05A * SD memory card ( 1 GB ) * SD memory card ( 2 GB ) * AC to DC 9V adapter. * USB cable, USB-01. * RS232 cable, UPCB-02. * Data Acquisition software, SW-U801-WIN.	

**Electrical Specifications (23±5°C):**

<b>PH Electrode</b>	Optional, Any PH electrode with BNC connector.	
<b>Measurement</b>	<b>PH</b>	0 to 14 PH
	<b>mV</b>	-1999 mV to 1999 mV
<b>Input Impedance</b>	10 <sup>12</sup> ohm	
<b>Temperature Compensation for pH measurement</b>	<b>Manual</b>	0 to 100°C, be adjusted by push button on front panel.
	<b>Automatic (ATC)</b>	With the optional temperature probe ( TP-07 ) 0 to 65°C.
<b>pH Calibration</b>	PH7, PH4, and PH10, 3 points calibration ensure the best linearity and accuracy.	

Measurement	Range	Resolution	Accuracy
<b>PH</b>	0 to 14 PH	0.01 PH	±(0.02 PH+2d)
<b>mV (ORP)</b>	0 to 1999 mV	1 mV	±(0.5%+2d)

\* PH accuracy is based on calibrated meter only.



## 86505/86555, BenchTop PH/ORP/COND/TDS/Salt, With Printer

- Programmable ph/orp(mv)/conductivity/tds/salinity w/temperature & real time clock stamped (86555 with easy & convenient to operate printer) •
- Powered by adaptor for continuously using super large lcd multi-display (or Batteries for 86555) • Collect data via rs232 by linking with a pc • Automatic ph buffer recognition for calibration up to 5 points hold function • Freezes the current readings • Maxi min review the memorized data • Reliable probes with temp. compensation • Convenient to view calibration information of probes • Ready indicator shows on lcd is selectable • Stores up to 99 memories stamped w / real time • Automatic or manual temp. compensation • Able to read ph slope(%)/offset(mv) displays • **optional & replacement accessories:** condo electrode: vz830paz-graphite or vz831 paz-platinum , ph electrode:vz86p3az-atc,vz86p2az-w/0 atc, orp electrode:vz850paz-platinum pin type, vz86p5az-platinum band type.

Model	86505	86555 with printer
Cond. Range	0-19.99,0-199.9,0-1999uS/cm, 0-19.99mS/cm, 0-199.9mS/cm	
Cond. Accuracy	±(1%FS+1digit) Under good calibration	
Cond. Resolution	0.01 uS/0.1 uS/1 uS/0.01 mS/0.1 mS	
Cond. Sell constant	1.0	
mV Range	-1999~+1999mV	
mV Resolution	0.1mV (± 199.9mV) or 1mV (others)	
pH Accuracy	±0.02 pH	
TDS Range	(f: TDS conversion factor) 0.00~(19.99*f)ppm 0.0~(199.9*f)ppm 0~(1999*f)ppm 0.00~(19.99*f)ppt, 0.1~(199.9*f)ppt	
TDS Accuracy	±(1% FS+1 digit)	
TDS Resolution	0.01/0.111 ppm, 0.01/0.1 ppt	
Salinity Range	0~11.38ppt 0~80.0ppt (Based on NaCl)	
Salt Accuracy	±(1% FS+1 digit)	
Salt Resolution	0.01 ppt , 0.1 ppt	
Temp.(TpH & Tcond)	-5.0~80.00°C(23.0~176.0°F)	
Temp. Accuracy	±0.50°C(±0.9°F)	
Cond-TDS conversion factor	0.300-1.000	
Cond/Temp. coefficient	0.0 to 10.0% per °C	
Power	Adaptor 9VDC (Recommend Linear AC adaptor)	AA bat. X4pcs or Adaptor 9VDC (Optional)
Operating Temperature	5~40°C (41~104°F)	
Operating/storage RH	Up to 95% w/o condensation	
Storage Temperature	-20~60°C (-4~140°F)	
Dimensions (mm)	L217xW168xH58	L260xW169xH56.8
Weight	137g	150g





## CD-4307SD, Conductivity Meter, SD Card, Real time Datalogger, TDS, Salt, Patent

- One meter for multi purpose operation: Conductivity, TDS (Total dissolved solids), Salt measurement.
- Conductivity : 200 uS/2 mS/20 mS/200 mS.
- Salt : 0 to 12 % salt (% weight).
- Conductivity measurement can select Temp. Coefficient of measurement solution.
- ATC for the conductivity measurement.
- Separate probe, easy for operation of different measurement environment.
- Real time SD memory card Datalogger, built-in Clock and Calendar, sampling time can set from 1 sec to 8 hour 59 min. 59 sec.
- Manual datalogger is available, during execute the manual datalogger function, it can set the different location no. (position 1 to position 99).
- Innovation and easy operation, computer is not needed to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can download all the measured values with the time information (year/month/date/hour/minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves.
- SD card capacity : 1 GB to 16 GB.
- LCD with green light backlight, easy reading.
- It can default auto power off or manual power off.
- Data hold, record max. and min. reading.
- Microcomputer circuit, high accuracy.
- Power by UM3/AA (1.5 V) x 6 batteries or DC 9V adapter.
- RS232/USB PC COMPUTER interface.

**Wide applications:** water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, school & college, water conditioning.

Model	CD-4307SD	
Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 52 mm x 38 mm LCD with green backlight ( ON/OFF ).	
Measurement Function	* Conductivity (uS, mS) * TDS (Total Dissolved Solids, PPM) * Salt (% Weight) * Temperature (°C, °F)	
Temperature Compensation	Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C.	
Conductivity Probe	Carbon rod electrode for long life.	
Datalogger Sampling Time Setting range	Auto	1 sec to 8 hour 59 min. 59 sec. @ Sampling time can set to 1 second, but memory data may loss.
	Manual	Push the datalogger button once will save data one time. @ Set the sampling time to 0 second. @ Manual mode, can also select the 1 - 99 position (Location) no.
Memory Card	SD memory card. 1 GB to 16 GB.	
Advanced setting	* SD memory card Format * Set clock time (Year/Month/Date, Hour/Minute/ Second) * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Set temperature unit to °C or °F * Set CD temperature compensation factor	
Data Hold	Freeze the display reading	
Memory Recall	Maximum & Minimum value	
Sampling Time of Display	Approx. 1 second	
Data Output	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
Power Supply	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent	
	* DC 9V adapter input. (AC/D C power adapter is optional)	
Power Current	Normal operation (w/o SD card save data and LCD Backlight is OFF): Approx. DC 14 mA	
	When SD card save the data and LCD Backlight is OFF): Approx. DC 37 mA	
	* If LCD backlight on, the power consumption will increase approx. 12 mA	
Operating Temperature	Meter	0 to 50 °C
	probe	0 to 60 °C
Operating Humidity	Less than 85% R.H.	
Weight	489 g/1.08 LB.	
Dimension	Meter	177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch)
	probe	Round, 22 mm Dia. x 120 mm length.
Accessories Included	* Instruction manual: 1PC * Conductivity/TDS/Salt probe, CDPB-03: 1PC * Hard carrying case, CA-06: 1PC	
Optional Accessories	* 1.413 mS Conductivity Standard Solution: CD-14 * SD memory card (1 GB)* SD memory card (2 GB) * AC to DC 9V adapter * USB cable, USB-01 * RS232 cable, UPCB-02 * Data Acquisition software, SW-U801-WIN.	

# WATER QUALITY Conductivity, PH Pocket

## Electrical Specifications (23±5°C): Conductivity (uS, mS)

Range	Measurement	Resolution	Accuracy
200 uS	0 to 200.0 uS	0.1 uS	±(2% F.S.+1d) * F.S. - full scale
2 mS	0.2 to 2.000 mS	0.001 mS	
20 mS	2 to 20.00 mS	0.01 mS	
200 mS	20 to 200.0 mS	0.1 mS	

\* Temperature Compensation: Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C. \* The accuracy is specified under measurement value ≤ 100 mS. \* mS - milli Simens \* @ 23± 5°C

## TDS (Total Dissolved Solids)

Range	Measurement	Resolution	Accuracy
200 PPM	0 to 132 PPM	0.1 PPM	±(2% F.S.+1d) * F.S. - full scale
2,000 PPM	132 to 1,320 PPM	1 PPM	
20,000 PPM	1,320 to 13,200 PPM	10 PPM	
200,000 PPM	13,200 to 132,000 PPM	100 PPM	

\* Temperature Compensation: Automatic from 0 to 60°C (32 - 140°F), with temperature compensation factor variable between 0 to 5.0% per C. \* The accuracy is specified under measurement value ≤ 100 mS. \* mS - milli Simens \* @ 23± 5°C

## Temperature

Function	Measuring Range	Resolution	Accuracy
°C	0°C to 60°C	0.1 °C	± 0.8 °C
°F	0°F to 140°F	0.1 °F	± 1.5 °F

@ 23± 5°C

## Salt

<b>Measurement Range</b>	0 to 12 % salt (% weight).
<b>Resolution</b>	0.01 % salt.
<b>Accuracy</b>	0.5 % salt value * F.S.: full scale.

## EC410, ExStik® II\* Conductivity Kit

Highly accurate multi-ranging sensor that measures Conductivity, TDS, Salinity, and Temperature.

- EC400 ExStik® II Conductivity/TDS/Salinity/Temperature meter with sensor, protective cap, 84µS, 1413µS and 12880µS standards (30mL bottle each), weighted base, 3 sample plastic cups with caps, four 3V CR2032 button batteries, 48" (1.2m) neckstrap, and carrying case.



Model	EC410		
Spec.	Ranges	Max. Resolution	Basic Accuracy
<b>Conductivity</b>	0 to 199.9µS/cm 200 to 1999µS/cm 2.00 to 19.99mS/cm	0.1µS/cm 1µS/cm 0.01mS/cm	±2% FS
<b>TDS</b>	0 to 99.9ppm (mg/L) 100 to 999ppm (mg/L) 1.00 to 9.99ppt (g/L)	0.1ppm (mg/L) 1ppm (mg/L) 0.01ppt (g/L)	±2% FS
<b>Salinity</b>	0 to 99.9ppm (mg/L) 100 to 999ppm (mg/L) 1.00 to 9.99ppt (g/L)	0.1ppm (mg/L) 1ppm (mg/L) 0.01ppt (g/L)	±2% FS
<b>Temperature</b>	32° to 149°F (0° to 65°C)	0.1°	±1.8°F/1°C
<b>Power</b>	Four SR44W button batteries		
<b>Dimensions</b>	Meter: 1.4 x 6.8 x 1.6" (36 x 173 x 41mm) Kit: 9.5 x 6.8 x 2.8" (241 x 173 x 71mm)		
<b>Weight</b>	Meter: 3.8 oz (110g), Kit: 1.56 lbs (708g)		

## EC510 ExStik® II PH/Conductivity Kit

Measures pH, Conductivity, TDS, Salinity, and Temperature using a combination electrode.

- EC500 ExStik II pH/Conductivity/TDS/Salinity/Temperature meter with combination electrode module, 84µS, 1413µS, 12880µS calibration standards, pH buffer pouches (1 each of 4, 7, 10pH plus rinse solution), weighted base, three sample cups with caps, four 3V CR2032 batteries, neckstrap, and case.



Model	EC510		
Spec.	Ranges	Max. Resolution	Basic Accuracy
<b>Conductivity</b>	0 to 199.9µS/cm 200 to 1999µS/cm 2.00 to 19.99mS/cm	0.1µS/cm	±2% FS
<b>TDS/Salinity</b>	0 to 99.9ppm (mg/L) 100 to 999ppm (mg/L) 1.00 to 9.99ppt (g/L)	0.1ppm (mg/L)	±2% FS
<b>PH</b>	0.00 to 14.00pH	0.01pH	±0.01pH
<b>Temperature</b>	23° to 194°F (-5 to 90°C)	0.1°F/°C	±1.8°F/1°C
<b>Waterproof</b>	IP57		
<b>Memory</b>	25 datasets		
<b>Dimensions</b>	1.4 x 7.3 x 1.6" (36 x 186 x 41mm)		
<b>Weight</b>	3.8oz (110g)		

## CD-4303, 200 uS/2 mS/20 mS, RS-232, Conductivity Meter

**Features:** Wide applications: water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, quality control, school & college, water conditioning • Innovative feature with built-in automatic temperature compensation • Carbon rod electrode for long life • Dual LCD display, show both conductivity & temp. values • Heavy duty & compact housing case • Records Maximum, Minimum & Average readings with RECALL • Data Hold function • Auto shut off saves battery life • Operates from DC 9V battery • RS 232 PC serial interface.



<b>Model</b>	<b>CD-4303</b>
<b>Measurement</b>	Conductivity: 3 ranges, 199.9 uS, 1.999 mS, 19.99 mS
<b>Memory Recall</b>	Records Max., Min. & Average readings with recall facility
<b>Power off</b>	Manual off by push button or Auto shut off offer 10 minutes(not activated during memory record function)
<b>Data Output</b>	RS 232 PC serial interface
<b>Power Supply</b>	DC 9V battery
<b>Weight</b>	350g
<b>Size</b>	Main instrument: 180 x 72 x 32 mm (7.1 x 2.8 x 1.3 inch)
	Probe: Round, 22mm Dia. x120mm length
<b>Accessories Included</b>	Instruction Manual - 1 PC. Sensor Probe - 1 PC. Carrying case - 1 PC.

### Conductivity:

Range	Measurement	Resolution	Accuracy
200 uS	0.1 to 199.9 uS	0.1 uS	±(2%F.S. +1d) *F.S. - Full scale
2 mS	0.2 to 1.999 mS	0.001 mS	
20 mS	2 to 19.99 mS	0.01 mS	

\* uS - micro Simens, mS - milli Simens

### Temperature:

<b>Measuring Range</b>	0°C to 60°C/ 32°F to 140°F
<b>Resolution</b>	0.1°C/ 0.1°F

## DO-5510, Dissolved & Atmospheric Oxygen Meter

**Features:** The polarographic type oxygen probe with an incorporated Temp. sensor, high precision measurement for Dissolved Oxygen(DO), Oxygen in air(O<sub>2</sub>) & Temp. measurement • Heavy duty dissolved oxygen probe, probe head can connect with BOD bottle • Automatic Temp. compensation from 0 to 50°C for sensor probe • Build in " % SALT " & " Mountain Height " compensation • adjustment button • Microprocessor circuit • Records Maximum, Minimum value • RS 232 PC serial interface.



<b>Model</b>	<b>DO-5510</b>	
<b>Display</b>	Dual function meter's display, 13 mm(0.5"). Super large LCD display with contrast adjustment for best viewing angle.	
<b>Measurement &amp; Range</b>	Dissolved Oxygen	0 to 20.0 mg/L(Liter)
	Oxygen in Air	0 to 100.0 %
	Temperature	0 to 50°C
<b>Resolution</b>	Dissolved Oxygen	0.1 mg/L
	Oxygen in Air	0.1% O <sub>2</sub>
	Temperature	0.1
<b>Accuracy (23±5°C)</b>	Dissolved Oxygen	±0.4mg/L
	Oxygen in Air	±0.7% O <sub>2</sub>
	Temperature	±0.8°C/1.5°F
<b>Sensor Structure</b>	The polarographic type oxygen probe with an incorporated temperature sensor.	
<b>Probe Compensation &amp; Adg.</b>	Temperature	0 to 50°C Automatic
	Salt	0 to 39% Salt
	Height (M.T.)	0 to 3900 meter
<b>Memory Recall</b>	Records Maximum, Minimum and Average readings with RECALL	



## DO-5512SD, dissolved oxygen meter, SD Card, real time datalogger, Patent

- Precision Dissolved Oxygen measurement • Dissolved oxygen: 0 to 20.0 mg/L • Dissolved oxygen meter use the polar graphic type oxygen probe with temperature sensor, high precision measurement for Dissolved Oxygen (DO) and temperature measurement. • Heavy duty dissolved oxygen probe, probe head can connect with BOD bottle. • DO use the automatic Temp. compensation. • DO meter build in " % SALT " & "Mountain Height" compensation value adjustment. • Separate probe, easy for operation of different measurement environment. • Real time SD memory card Datalogger, it Built-in Clock and Calendar, real time data recorder, sampling time set from 1 sec to 8 hour 59 min. 59 sec. • Manual datalogger is available (set the sampling time to 0), during execute the manual datalogger function, it can set the different position (location) No. (position 1 to position 99). • Innovation and easy operation, computer is not need to setup extra software, after execute datalogger, just take away the SD card from the meter and plug in the SD card into the computer, it can down load the all the measured value with the time information (year/month/date/hour/minute/second) to the Excel directly, then user can make the further data or graphic analysis by themselves. • SD card capacity : 1 GB to 16 GB. • LCD with green light backlight, easy reading. • Can default auto power off or manual power off. • Data hold, record max. and min. reading. , high accuracy. • Power by UM3/AA (1.5V) x 6 batteries or DC 9V adapter. • RS232/USB PC COMPUTER interface. • Wide applications: water conditioning, aquariums, beverage, fish hatcheries, food processing, photography, laboratory, paper industry, plating industry, quality control, school & college, water conditioning.

Model	DO-5512SD	
Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 52 mm x 38 mm LCD with green backlight (ON/OFF).	
Measurement	Dissolved Oxygen, Air oxygen (for reference only)	
Measurement & Range	Dissolved Oxygen	0 to 20.0 mg/L (Liter).
	Oxygen in Air	0 to 100.0 %.
	Temperature	0 to 50°C.
Resolution	Dissolved Oxygen	0.1 mg/L.
	Oxygen in Air	0.1 % O <sub>2</sub> .
	Temperature	0.1°C.
Accuracy (23± 5°C )	Dissolved Oxygen	± 0.4 mg/L.
	Oxygen in Air	± 0.7% O <sub>2</sub> .
	Temperature	± 0.8 °C/1.5 °F.
Probe Compensation & Adj.	Temperature	0 to 50 °C, Automatic
	Salt	0 to 50 % Salt
	Height ( M. T.)	0 to 8900 meter
Oxygen Probe	The polarographic type oxygen probe with temp. sensor.	
Datalogger Sampling Time Setting range	Auto	1 sec to 8 hour 59 min. 59 sec. @ Sampling time can set to 1 second, but memory data may loss.
	Manual	Push the datalogger button once will save data one time. @ Set the sampling time to 0 second. @ Manual mode, can also select the 1 - 99 position (Location) no.
Memory Card	SD memory card. 1 GB to 16 GB.	
Advanced setting	* SD memory card Format * Set clock time (Year/Month/Date, Hour/Minute/ Second) * Set sampling time * Auto power OFF management * Set beep Sound ON/OFF * Decimal point of SD card setting * Set temperature unit to °C or °F * Set DO salt% compensation value * Set DO height ( meter ) compensation value * Set DO height ( feet ) compensation value	
Data Hold	Freeze the display reading	
Memory Recall	Maximum & Minimum value	
Sampling Time of Display	Approx. 1 second	
Data Output	RS 232/USB PC computer interface. * Connect the optional RS232 cable UPCB-02 will get the RS232 plug * Connect the optional USB cable USB-01 will get the USB plug.	
Power Supply	* Alkaline or heavy duty DC 1.5 V battery (UM3, AA) x 6 PCs, or equivalent * DC 9V adapter input. (AC/D C power adapter is optional)	
Power Current	Normal operation (w/o SD card save data and LCD Backlight is OFF): Approx. DC 14 mA	
	When SD card save the data and LCD Backlight is OFF): Approx. DC 37 mA	
	* If LCD backlight on, the power consumption will increase approx. 12 mA	
Operating Temperature	0 to 50 °C	
Operating Humidity	Less than 85% R.H.	
Weight	Meter: 489 g/1.08 LB. probe: 335 g/0.74 LB	
Dimension	Meter: 177 x 68 x 45 mm (7.0 x 2.7x 1.9 inch) probe: 190 mm x 28 mm Dia. ( 7.5" x 1.1" Dia. )	
Accessories Included	* Oxygen probe ( OXPB-11 ): 1PC * Hard carrying case ( CA-06 ): 1PC * Operation manual: 1PC * Spare Probe head with Diaphragm OXHD-04: 2 set * Probe-filling Electrolyte OXEL-03: 1 set	
Optional Probe & Accessories	*Oxygen probe: OXPB-11 * Spare Probe head with Diaphragm set: OXHD-04 * Probe-filling Electrolyte: OXEL-03 * RS232 cable: UPCB-02 * USB cable: USB-01 *Data Acquisition software: SW-U801-WIN * AC to DC 9V adapter	



**ITS-486911, 476 nm Photometer**

On-Site testing for Lead, Mercury and Cadmium in Water. Meter also can be used to detect Lead in Paint, Soil, Glassware, Crystal and Ceramics.

- Accurate results with fewer steps
- Non-Technical Procedure
- 3 ppb (pg/L) or .03 pg lead detection
- Affordable (as little as £.80 per test)
- Uses patented technology (U.S. Patent 7333194)
- 2-Year warranty with satisfaction guarantee.



Menu	Tests for	Range	Resolution	± Accuracy
PA1	Diluted Homogenized Paint Lead	0.000 to 1.99	0.001	0.003 or 6%
PB2	Lead in Water (auto-zero)	1-500 µg/L	1 µg/L	3 µg/L or 6%
HG3	Mercury in Water (auto-zero)	10-600 µg/L	1 µg/L	6 µg/L or 6%
CD4	Cadmium in Water (auto-zero)	0.01-0.80 mg/L	0.01 mg/L	0.06 mg/L or 6%
AB5	Future or Custom Tests Absorbance	0.000-1.99 abs	0.001 abs	0.003 or 6% abs
PB6	Lead in Water	1-500 µg/L	1 µg/L	3 µg/L or 6%

**Tests:**

Part	Parameter/Product
486900	eXact® LEADQuick™ Photometer – Meter only (476 nm) Meter Only. For use with reagent sets below.
486001	Carrying case with foam for eXact® LEADQuick™
486900-W	eXact® LEADQuick™ Water Test Kit Kit includes eXact® LEADQuick™ Photometer (486900), carrying case, and reagents (486901)
486901	eXact® LEADQuick™ Water Reagent Set (For use with 486900) Reagent Set includes: ACID-1, PB-2, PB-3, PB-4, MSDS Sheet
486904	eXact® Cadmium (as Cd <sup>+2</sup> ) Reagent Set (For use with 486900) Reagent Set includes: HCl-1, PB-2, P6-3, PB-4, MSDS Sheet
486911	LeadPaintCheck Startup Kit Kit includes: Instructions, eXact® LEADQuick™ Photometer (486900), LeadPaintCheck Reagents (486905)x2, Homogenizer Kit by Omni (486950), 500ml Wash Bottle, 15ml Plastic Conical Tube with rack x 50 (486952), 50ml Plastic Conical Tubex50 (486953), ½" Cork Bore, Cork Bore Sharpener (48954), Accumax Jr. 100p1 Pipette (486955), Pipette Tip for 100p1 Pipette x 96 (486956), ¼" Cork Bore, Sharp Scissors, Forceps, Rob and Base for Homogenizer (S1000), Small Brush, Funnel System, Scalpel with Blades, Masking Tape, Cork Bore Remover, Video on CD.
486905	LeadPaintCheck Replacement Reagent Set (For use with 486900) Reagent Set includes: ACID-1 (x6 bottles), PB-2, PB-3, MSDS Sheet
487925-V	LEADQuick™ Paint – Home Visual Lead Paint Test Kit Kit includes: Instructions, PB-1P (487925-P), PB-2 (488375-B), PB-3 (488375-C), Small Tube x 5, Color Chart



**ITS-486696-PLUSK, 525 nm Chlorine Plus**

**Specifications:**

Menu	Tests for	Range	Resolution	+/- Accuracy
CL1	Free Chlorine & Total Chlorine	0-11 ppm	0.01 (0-5.99ppm)	±3% (0-3.00ppm)
			0.1 (6-11ppm)	±7% (3.01-5.99ppm)
bR2	Bromine	0-14 ppm	0.01 (0-5.99ppm)	±3% (0-2.50ppm)
			0.1 (6-14ppm)	±6% (2.51-14ppm)
O3	Ozone	0.01-9 ppm	0.01 (0.01-5.99ppm)	±8% (0.01-5.99ppm)
			0.1 (6-9ppm)	±16% (6.0-9ppm)
Cd4	Chlorine Dioxide	0-12 ppm	0.01 (0-5ppm)	±8%
			0.1 (5.01-12ppm)	
PA5	Peracetic Acid	0-9 ppm	0.01 (0-5ppm)	±8% (0-5.00ppm)
			0.1 (5.1-9ppm)	±9% (5.1-9ppm)
HP6	Hydrogen Peroxide	0-3 ppm	0.01 (0-1ppm)	±10% (0-1.00ppm)
			0.01 (1.1-3ppm)	±13% (1.1-3ppm)
TR7	Transmission	99.9-0.01 %T	0.01 (0.01-9.99 %T)	±1%
			0.1 (10-99.9 %T)	
HR8	High Range Chlorine	0-300 ppm	1	±8%

\* Performance verified with various water Samples With optimal water temp. at 10-40°C.

Part	Parameter/Product
486696-PLUSK	eXact® Chlorine Plus Kit Kit includes 25 tests of CL (DPD-1) (486637-25), bR (486636-25), O3 (486634-25), Cd (486633-25), PA (486674-25), HP (486616-25), HR (486672-25), 50 Glycine (484014) strips

## ITS-486698-K, 525nm & 638nm Dual Wavelength Photometer



ITS-486698-K

- Ideal for accurate Environmental Testing and Aquaculture Monitoring

Menu	Tests for	Range	Resolution	± Accuracy
AL1	Total Alkalinity (as CaCO <sub>3</sub> ) <sup>1</sup>	1 -320ppm	0.01 (0-50.0ppm)	10 (1-100ppm)
			1 (51-320ppm)	7.5 (101-200ppm) 11 (201-320ppm)
NO2	Nitrite (as NO <sub>2</sub> ) <sup>1</sup>	0.01-1.8ppm	0.01	5
NO3	Nitrate (as NO <sub>3</sub> )	0.12-30ppm	0.01 (0-5.00ppm)	20
			0.1 (5.1-30ppm)	
NH4	Ammonia (as NH <sub>3</sub> ) <sup>1</sup>	0.01-2.4ppm	0.01	5
TH5	Total Hardness (as CaCO <sub>3</sub> ) <sup>1</sup>	5-300ppm	1	19 (5-80ppm) 17 (81-180ppm) 16(181-300ppm)
CL6	Free & Total Chlorine <sup>1</sup>	0.01-5ppm	0.01	3 (0.01-1.50ppm)
				6 (1.51-5ppm)
bt7	pH, BT	4.5-9.2 pH	0.01	0.2 pH (4.5-7.50) 0.5pH (7.51-9.2)
PO8	Phosphate (as PO <sub>4</sub> ) <sup>1</sup>	0.01-4 ppm	0.01 (0-2.50ppm)	4 (0301-2ppm)
			0.1 (2.6-4ppm)	7.5 (2.01-4ppm)
CU9	Copper (as Cu <sup>+2</sup> ) <sup>1</sup>	0.01-11ppm	0.01 (0-4.00ppm)	2
			0.1 (4.1-11ppm)	
CH0	Salt (as NaCl) <sup>1</sup>	1-430ppm	1	20 (1-100ppm)
				24 (101-250ppm)
				21 (251-430ppm)
P11	pH, BT	4.5-9 pH	0.01	0.2 pH (4.5-7.5)
				0.6 pH (7.6-9)

<sup>1</sup> Performance verified with various salt Systems and water Samples With optimal water temperature at 10-40°C. Optimal water temperature for Total Alkalinity test is 15-40°C.

Part	Parameter/Product
486698-K	eXact® Eco-Check Kit Kit includes: 25 tests of CL (DPD-4) (486670-25), AL (486641-25), BTPH (486652-25), BTPH Reagent (486657-25), CH (481657-II), NH3 (486654), Cu (486632-25), NO <sub>3</sub> (486655-25), NO <sub>2</sub> (486623-25), PO <sub>4</sub> (486814-25), TH (486673-25) strips & Mini Dilution Kit II (487202)

## ITS-486700, 525nm & 638nm Dual Wavelength Photometer

Introducing the ultimate Water Quality Tester, the eXact® Micro 20 dual wavelength photometer. It features ultra-performance using narrow band wavelength filters for enhanced results and stable, long-life LED light sources and a built-in cell that uses a simple patented system for colorimetric analysis. All tests are designed to use an identical 20-second procedure called the EZ-3™ Reagent Delivery methodology that minimizes confusion for non-technical users. The eXact® Micro 20 delivers lab-quality results at minimal cost.



ITS-486700

### Reagents:

parameter/test	Part	Range	Resolution	Chemistry	Tests
Alkalinity, Total	486641	0 - 200ppm	1	Alizarin Red S+Citrate	100
Aluminum	486821	0 - 0.9ppm	0.01	PV	50
Ammonia	486654	0 - 2.3ppm	0.01	Salicylate Method	25
Biguanide	486810	0 - 250ppm	1	Bromophenol Blue	50
Bromine (DPD-1)	486636	0 - 12ppm	0.1	DPD	100
Chloride (as NaCl) II	481657-II	0 - 400ppm	5	Silver (ppt)	25
Chlorine Dioxide (DPD-1)	486633	0 - 10ppm	0.1	DPD	100
Chlorine, Free (DPD-1)	486637	0 - 4.5ppm	0.01	DPD	100
Chlorine, High Range Free	486672	0 - 300ppm	1	KI + Buffer	50
Chlorine, Total (DPD 3)**	486638	0 - 4.5 ppm	0.01	KI	100
Chlorine, Total (DPD-4)	486670	0 - 4.5ppm	0.01	DPD + KI	100
Chromium (VI)	486614	0 - 1.8ppm	0.01	Diphenylcarbazide	50
Copper (Cu <sup>+2</sup> )	486632	0 - 11ppm	0.01, 0.1	Biquinoline	50
Cyanide	486812	0 - 2.3ppm	0.01	Isonicotinic/Barbituric Acid	50
Cyanuric Acid II	481652-II	0 - 110ppm	1	Melamine (ppt)	60
Fluoride	486643	0 - 1.5ppm	0.01	SPADNS	25
Glycine (used for Chlorine Dioxide)	484014	N/A	N/A	Glycine	50
Hydrogen Peroxide LR	486616	0 - 2ppm	0.01	DPD+PO <sub>4</sub> +MoO <sub>4</sub> +KI	50
Total Hardness (as CaCO <sub>3</sub> )	486673	0 - 300ppm	1	Phthalein Purple	50
Manganese	486606	0 - 1.5ppm	0.01	PAN + Cyanide	24
Nitrate (as NO <sub>3</sub> )	486655	0 - 16ppm	0.01, 0.1	Zinc Reduction	50
Nitrite (as NO <sub>2</sub> )	486623	0 - 1.6ppm	0.01	Chromotropic Acid	50
Ozone (DPD-4)	486634	0 - 4.5ppm	0.01	DPD + KI	100
Peracetic Acid (DPD-4)	486674	0 - 5ppm	0.01	DPD + KI	100
Permanganate (DPD-1)	486676	0 - 4.5ppm	0.01	DPD	100
pH	486639	5.5-8.4ppm	0.1	Phenol Red	100
pH, BT	486652	4 - 9ppm	0.1	Bromothymol Blue & Thymol Blue	100
Phosphate	486814	0 - 6.5ppm	0.01, 0.1	Molybdate Method	50
Quaternary Ammonia	486823	0 - 250ppm	1	Bromophenol Blue & Citrate Buffer	100
Sulfate	486608	0 - 200ppm	1	Barium (ppt)	50
Sulfide	486818	0 - 1.6ppm	0.01	DPD Reagent/FeCl <sub>3</sub>	50
Total Iron, TPTZ	486650	0 - 7.5ppm	0.01, 0.1	TPTZ + PP	50

**ITS-486691-K, 525 nm Photometer Specifications:**

- Directly reads 14 parameters
- Uses patented technologies (U.S Patent 7333194, 7491546)
- 0.01 ppm (mg/L) resolution
- Built-in cell and countdown timer
- Accurate, reliable, and portable
- 20-Test memory for each menu (160 total)
- 2-Year warranty with satisfaction guarantee.



Menu	Tests for	Range	Resolution	± Accuracy
CL1	Free Chlorine & Total Chlorine	0-11 ppm	0.01 (0-5.99ppm)	2 (0-3.00ppm)
			0.1 (6-11ppm)	7 (3.01-5.99ppm)
				12 (6.0-11ppm)
PH2	pH	6.2-8.4 pH	0.1	0.4pH
BR3	Bromine	0-14 ppm	0.01 (0-5.99ppm)	3 (0-2.50ppm)
			0.1 (6.0-14ppm)	8 (2.51-14ppm)
AL4	Total Alkalinity (as CaCO <sub>3</sub> )	5-300 ppm	1	12 (5-50ppm)
				10 (51-200ppm)
				13 (201-300ppm)
TH5	Total Hardness (as CaCO <sub>3</sub> )	1-320 ppm	1	10
CU6	Copper (as Cu <sup>+2</sup> )	0.04-8 ppm	0.01 (0.04-2.99ppm)	3
			0.1 (3.0-8ppm)	
FE7	Total Iron (as Fe)	0.03-5 ppm	0.01	3 (0.03-1ppm)
				4 (1.01-3.5ppm)
				10 (3.51-5ppm)
HR8	High Range Chlorine	0-300 ppm	1-300 ppm	8

\* Performance verified with various salt Systems and water Samples With optimal water temperature at 10-40°C. Optimal water temperature for Total Alkalinity test is 15-40°C. Optimal water temperature for High Range Chlorine test is 0-40°C.

Part	Parameter/Product
486691-K	eXact <sup>®</sup> Micro 7+ Standard Kit Kit includes Micro 7+ (486691), 25 tests of CL (DPD-1) (486637-25), CL (DPD-3) (486638-25), AL (486641-25), PH (486639-25), CA (486629-25), CU (486632-25), HR (486672-25) strips
486678	eXact <sup>®</sup> Micro Combo Lab Kit includes Micro 7+ (486691), Micro 8(486800), tests of each: CL (DPD-1) (486637-25), CL (DPD-3) (486638-25), AL (486641-25), CA (486629-25), CU (486632-25), PO <sub>4</sub> (486814), NH <sub>3</sub> (486654), BT-PH (486652), FE (TPTZ) (486650), and HR (486672)

**Reagents:**

parameter/test	Part	Range	Chemistry	Tests
Alkalinity, Total	486641	5 - 300 ppm	Alizarin Red S + Citrate	100
Bromine (DPD-1)	486637	0-14 ppm	DPD	100
Chlorine, Free (DPD-1)	486637	0- 11 ppm	DPD	100
Chlorine, Free (DPD-1)	484051	0- 11 ppm	DPD	100 Foils
Chlorine, Total (DPD-3)*	486638	0- 11 ppm	KI	100
Chlorine, Total (DPD-3)*	484103	0-11 ppm	KI	100 Foils
Chlorine, Total (DPD-4)	486670	0-11 ppm	DPD + KI	100
Chlorine, Total (DPD-4)	484054	0-11 ppm	DPD i.- KI	100 Foils
Chlorine, High Range Free	486672	0- 300 ppm	K) + Buffer	50
Copper (Cu <sup>+2</sup> )	486632	0.04 - 8 ppm	Biguinoline	50
Hardness, Total	486673	1 -320 ppm	Phthalein Purple	50
Total Iron, TPTZ	486650	0.03 - 5 ppm	TPTZ + PP	50
Ozone (DPD-4)	486670	0-11 ppm	DPD + KI	100
Permanganate (DPD-1)	486637	0 - 11 ppm	DPD	100
pH	486639	6.2 - 8.4 pH	Phenol Red	100

Total Chlorine DPD-3 Test requires Free Chlorine DPD-1 (486637) to be run first. For resellers and distributors - products sold in case quantities (12 units per case).



**TU-2016**

### TU-2016, Turbidity Meter

- Designed to meet ISO 7027.
- NTU (Nephelometric TURBIDITY Unit) measuring unit.
- Wide and auto measurement range : 0 to 1,000 NTU.
- High resolution : 0.01 NTU/1 NTU.
- The unique optics structure, enables the instrument to read low value of TURBIDITY to the high level up to 1,000 NTU.
- Four operation buttons and two calibration points, easy operation.
- Jumbo LCD, easy readout.
- Microprocessor circuit assures maximum possible accuracy, provides special functions and features.
- Battery operated for field and on-site testing convenience.
- Data hold function for freezing the desired value on display.
- Records Maximum and Minimum readings with Recall.
- Heavy duty & compact housing with hard carrying case, designed for easy carry out & operation.
- Auto shut off is available to save battery life.
- Application : Test municipal water, food and beverage water, or other aqueous solution where fluid clarity is important.

Model	TU-2016	
Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 41 mm x 34 mm	
Range	0.00 to 50.00 NTU, 50 to 1,000 NTU * NTU : Nephelometric Turbidity Unit * Auto range	
Resolution	0.01 NTU/ 1 NTU	
Accuracy	± 5 % F.S. or ± 0.5 NTU, which ever is greater.	
Light source	LED, 850 nm.	
Detector	Photo diode	
Standard	Meet ISO 7027.	
Response time	Less than 10 seconds.	
Sample volume needed	10 mL.	
Data Hold	Freeze the display reading.	
Memory Recall	Maximum & Minimum value.	
Sampling Time	Approx. 1 second.	
Power off	Auto shut off saves battery life or manual off by push button.	
Calibration points	0 NTU, 100 NTU.	
Operating Temperature	0 to 50°C.	
Operating Humidity	Less than 85% R.H.	
Power Supply	DC 1.5 V battery ( UM4, AAA ) x 6 PCs, or equivalent.	
Power Current	Stand by	Approx. DC 3.5 mA.
	Testing	Approx. DC 36 mA.
Weight	320 g/0.70 LB. @ Battery is included.	
Dimension	155 x 76 x 62 mm ( 6.1 x 3.0 x 2.4 inch)	
Accessories Included	* Testing bottle with 0 NTU standard solution: 1 PC * Testing bottle with 100 NTU standard solution: 1 PC * Empty testing bottle: 2 PCs * Clean cloth: 1 PC * Clean solution (Distill water): 1 bottle* Hard carrying case, CA-08: 1 PC	
Optional Accessories	* Testing bottle with 100 NTU standard solution, TU-100NTU * Testing bottle with 0 NTU standard solution, TU-0NTU * Empty testing bottle, 0601	



## WPL Series, Laboratory Water Purification Systems

- **WPL-RO** Series deionized water system (Tap water inlet)
- **WPL-RO-S** Series ultra pure water system (Tap water inlet)
- **WPL-RO-D** Series ultra pure water system (DI water inlet).



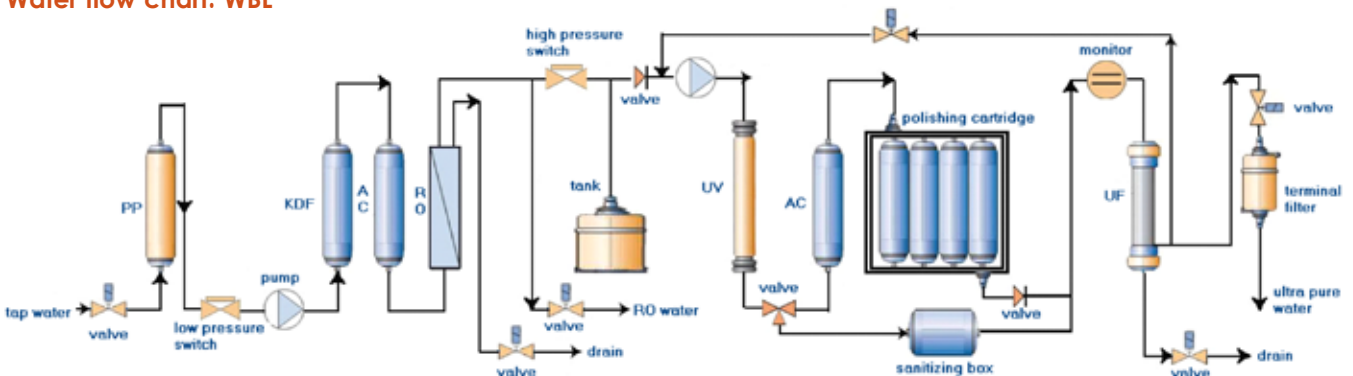
### LCD display function:



### Features and Advantage:

<b>Control System</b>	Microprocessor control
<b>Display System</b>	240x128 Graphical LCD display
<b>Quality Monitor</b>	3-way online sensor, detecting the quality of inlet, RO outlet and ultrapure water respectively
<b>Visual and Audio Alarm</b>	Multiple alarm—including inlet water over standard, no water, full water, outlet water over standard, Consumable' life-span ends, malfunction auto-detect
<b>Recirculation System</b>	Manual and auto, freely switchable, ultra-pure water recirculation system, keeping a low polluted-level of bacteria
<b>Safety System</b>	With factory and clients' two password, every system setting can be protected, avoiding unauthorized operating
<b>Filter replacement remainder</b>	The life-span can be set and the time used and left can be displayed, replacing auto-reminding, avoiding the decline of water quality.
<b>Sanitization system</b>	Ultra pure water pipeline can be regularly disinfected to keep a high quality water
<b>RO membrane flush</b>	Automatically RO membrane flushing function, extending its life-span
<b>"on-off duty" mode</b>	On/off duty mode increase filter life span
<b>Water tank</b>	Various kind of tanks to meet different needs and assure water-supply
<b>Machine case</b>	Human engineering design, streamline case
<b>Pipeline and adaptor</b>	Pipeline with NSF authorization to assure high quality ultrapure water; new easy-inserting adaptor to make convenience of cartridge maintaining and replacing
<b>Pretreatment cartridge</b>	Ultra long-life pre-cartridge, 6-8 times of normal active carbon (expect PP filter), unnecessary replacement for 2 year most, reducing the working cost
<b>RO membrane</b>	Manufactured by DOW or FCS, realize the combination of long-life and high-quality
<b>Ultra purification cartridge</b>	4 cartridges of ultra purification, using famous nuclear resin to assure best quality
<b>UV module</b>	Double wavelength (185nm & 254nm) UV lamp, restraining bacteria's increase, reducing TOC & enhancing the applicability
<b>UF module</b>	MWCO 5000D PES UF module, effectively eliminating endotoxin, can be used for precise cell cultivating and IVF
<b>Terminal Filtration</b>	Sartorius high-speed and large flux 0.45+0.2 $\mu\text{m}$ polyether alternative compound filter terminal disinfection filter, assuring the quality absolutely axenic

### Water flow chart: WBL



**Accessories:**

**Extra pretreatment**  
Including: microfiltration, soft water, KDF filter cartridge, dislodge granular, residual chlorine, organics, heavy metal in case of scaling, bacterial growth & hard water.

**Built-in tank**  
It has 2 pieces of 15 Liter tank, and save more room.

**Humanized tray**  
It's a good place for water cup.

**Built-in polishing resin cartridge**  
The capacity is 12 Liter, ensure the resistivity is more than 10MΩ-cm, and it could produce about 20000 Liter water.

**Remote water gun**  
You could take the water from 3 meters away, if has the water gun.

**Portable resistivity meter**  
Measure the resistivity easily in any place.

**Utilizing global high-quality parts:**

- RO membrane: DOW or CSM
- Ultra purification cartridge: Rohm & hass or DOW
- UV, UF cartridge: world famous brand
- Terminal filtration: world famous brand
- Pump: world famous brand
- Water quality monitor system: world famous brand
- Other components: world famous brand.



**Incorporating cutting-edge technology:**

- RO Series uses the reverse osmosis technology of NASA. Desalination rate ≥99%, eliminating virus rate ≥99.5%
- Special circle-inside function to guarantee water quality
- II mixed beds guarantees water quality and increase the life-span of ultra purification cartridge
- Double wave length UV lamp efficiently decreases virus and TOC
- Ultra purification cartridge efficiently eliminates endotoxin
- High flux terminal filtration with pre-filtration function.

**Options:**

Model	Description
171-1-000010	Bottom layer
171-1-000011	10' pretreatment filter, including 10' spun fiber filter, water softener, KDF
171-1-000012	Pure polishing resin cartridge, Capacity is 12 Liter
171-1-000013	Tank, Capacity is 15 Liter
171-1-000014	Water gun, Including PFA telescopic pipe 1/4" 3M
171-1-000015	Water gun, Including PP telescopic pipe 1/4" 3M
171-1-000016	Portable resistivity meter

**WPL-RO-HP-15/30 Systems, Deionized Pure Water Systems (Tap water inlet)**

Model		Reverse osmosis deionized water purification system			
		WPL-RO-15	WPL-RO-HP-15	WPL-RO-30	WPL-RO-HP-30
<b>Flow procedure</b>		PF+KDF+AC+RO+AC-DI	PF+KDF+AC+RO+AC+UV+DI+TF	PF+KDF+AC+RO+AC+DI	PF+KDF+AC+RO+AC+UV+DI+TF
<b>Application</b>		<ul style="list-style-type: none"> <li>• ware washing • Agricultural • General biological • Aquatic products feeding</li> <li>• Inlet water for Ultra pure water machine • water for sterilizer/ T&amp;H chamber</li> <li>• Buffer disposing • Aseptic drinking water • Physical and chemical analysis</li> <li>• Fine chemistry industry • Inlet water for Ultra pure water machine • GC/HPLC</li> </ul>			
<b>Pure water Index</b>		High pure water resistivity:17.5-13 MΩ-cm, RO water(TDS):10-5ppm*, Heavy metal<0.1ppb, TOC<30ppb. Bacteria <1 CFU/ml(Only for UT model), Particle(>0.22µm)<1/ml(Only for UT model)			
<b>Technical spec.</b>	<b>Output(25°C)</b>	15 Liters/hour* / 30 Liters/hour*			
	<b>Moment output</b>	1.5 Liters/min (with pressure tank)			
	<b>Pure water outlet</b>	RO Water, High pure water			
	<b>Dimension / Weight / Power</b>	WxDxH:54x36x50cm/ 30-20 Kg/ 220V/50HZ, 120W			
<b>Control system</b>	<b>Mode display</b>	Power on, program, inlet rinse, producing, full, circle, regular outlet, disinfection, consumables replacing reminder			
	<b>Safety</b>	Low pressure and full water alarm, password,auto-reset, outlet forbidden if alarm or disinfection			
	<b>System monitor</b>	Monitoring quality of inlet water, RO water and ultrapure water, temperature, used and left time of consumables			
<b>Water source required</b>		Tap water; inlet TDS<200 ppm, 1-40°C, 1.0-3.5 kg/cm2 (if inlet TDS>200ppm, pretreatment is recommended)			
<b>Purification system</b>	<b>Pretreatment unit</b>	5µm spun fiber filterx+1 Long-effective KDF filterx+1 Granular active carbon filterx1			
	<b>RO unit</b>	100 GPD RO membranex1 (30L model: 2x100 GPD RO membrane)			
	<b>Subsequent unit</b>	Post active carbon filterx1 + Mixed resin cartridgex3 {30L model: Mixed resin cartridgex4} UT model: 254nm UV cartridgex1 + 0.2µm terminal filterx1			
<b>Standard configuration</b>		Main body(including:1 set cartridge)+4gallon tank			

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate.

\*\* GPD=gallon per day 1gallon=3.8L.

\*\*\* The quality of inlet water will effect output's and cartridge's life.

PF: Pretreating, KDF: Kinetic degradation fluxion, AC: Active carbon, RO: Reverse osmosis, DI: Ion exchange, UV: Ultraviolet, TF: Terminal filter.



## WPL-RO-UP Systems, Ultra Pure Water Systems (Tap water inlet)

Model		Standards	Eliminating endotoxin	Low TOC	Comprehensive
		WPL-RO-UP-15-S WPL-RO-UP-30-S	WPL-RO-UP-15-UF WPL-RO-UP-30-UF	WPL-RO-UP-15-UV WPL-RO-UP-30-UV	WPL-RO-UP-15-UVF WPL-RO-UP-30-UVF
<b>Flow procedure</b>		PF+KDF+AC+RO+AC-DI+TF	PF+KDF+AC+RO+AC+DI+UF+TF	PF+KDF+AC+RO+UV+AC+DI+TF	PF+KDF+AC+RO+UV+AC+DI+UF+TF
<b>Application</b>		GC,HPLC,IC,ICP PCR, weather analysis Amino acid analysis Reagent preparation	Molecular biology Cell & tissue cultivation Life science,IVF electrophoresis	HPLC,IC,ICP-MS TOC & organism analyse CF-AAS,toxicology study Environmental analyse	HPLC,IC,ICP-MS,CF-AAS Physics,electrochemistry, Molecular biology, Cell cultivation
<b>Pure water quality</b>	<b>Resistivity</b>	18.2 MΩ-cm@25°C			
	<b>Heavy metal</b>	< 0.1ppb			
	<b>TOC</b>	<10 ppb		<3 ppb	
	<b>Bacteria</b>	<1 CFU/ml			
	<b>Endotoxin</b>	-	<0.001 EU/ml	-	<0.001 EU/ml
	<b>Particle(&gt;0.22µm)</b>	<1 / ml			
	<b>TDS (RO water)</b>	5-10 ppm*			
<b>Technical spec.</b>	<b>Output(25°C)</b>	15/30 Liters/hour*			
	<b>Moment output</b>	1.5 Liters/min (with pressure tank) (Less output with UF/UV cartridge)			
	<b>Pure water outlet</b>	RO Water, Ultra pure water			
	<b>Dimension / Weight / Power</b>	WxDxH: 50x36x 54cm / 20-30 Kg / 220V/50HZ, 120W			
<b>Control system</b>	<b>Mode display</b>	Power on, program, inlet rinse, producing, full, circle, regular outlet, disinfection, consumables replacing reminder			
	<b>Safety</b>	low pressure and full water alarm, password, auto-reset, outlet forbidden when alarm or disinfection status			
	<b>System monitor</b>	Monitoring quality of inlet water, RO water and ultrapure water, temperature, used and left time of consumables			
<b>Water source required</b>		Tap water; inlet TDS<200 ppm, 1-40°C, 1.0-3.5 kg/cm2 (if inlet TDS>200ppm, pretreatment is recommended)			
<b>Purification system</b>	<b>Pretreatment unit</b>	5µm spun fiber filterx1+ Long-effective KDF filterx1+ Granular active carbon filterx1 (30L model: 10" PP filterx1+10" KDF filterx1+10"granular active carbon filterx1)			
	<b>RO unit</b>	100 GPD RO membranex1 (30L model: 2x100 GPD RO membrane)			
	<b>Subsequent unit</b>	Post active carbon filterx1 +Ultra pure polishing resin cartridgex 0.2 +4µm terminal filterx1 UV model:+Double wavelength(254&185 nm)UV cartridgex1 UF model:+ 5000 Doulton UF cartridgex1 UVF model:+Double wavelength(254&185 nm)UV cartridgex5000+1 Doulton UF cartridgex1			
<b>Standard configuration</b>		Main body(including:1 set cartridge)4 gallon tank			

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate.

\*\* GPD=gallon per day 1 gallon=3.8L.

\*\*\* The quality of inlet water will effect output's and cartridge's life.

PF: Pretreating, KDF: Kinetic degradation fluxion, AC: Active carbon, RO: Reverse osmosis, DI: Ion exchange, UV: Ultraviolet (Double wavelength: 254&185nm), UF: Ultrafiltration TF: Terminal filter.



## WPL-UP Systems, Ultra Pure Water Systems (Pure water inlet)

Model		Standards	Eliminating endotoxin	Low TOC	Comprehensive
		WPL-UP-S	WPL-UP-UF	WPL-UP-UV	WPL-UP-UVF
<b>Flow procedure</b>		AC+DI+TF	AC+DI+UF+TF	UV+AC+DI+TF	UV+AC+DI+UF+TF
<b>Application</b>		GC,HPLC,IC,ICP PCR, weather analysis Amino acid analysis Reagent preparation	Molecular biology Cell & tissue cultivation Life science,IVF electrophoresis	HPLC,IC,ICP-MS TOC & organism analyse CF-AAS,toxicology study Environmental analyse	HPLC,IC,ICP-MS,CF-AAS Physics,electrochemistry, Molecular biology, Cell cultivation
<b>Pure water quality</b>	<b>Resistivity</b>	Ultra pure water:18.2 MΩ-cm@25°C ;High pure water:≥3 MΩ-cm			
	<b>Heavy metal</b>	< 0.1ppb			
	<b>TOC</b>	<10 ppb		<3 ppb	
	<b>Bacteria</b>	<1 CFU/ml			
	<b>Endotoxin</b>	-	<0.001 EU/ml	-	<0.001 EU/ml
	<b>Particle(&gt;0.22µm)</b>	<1 / ml			
<b>Technical spec.</b>	<b>Output</b>	1.5 Liters/min(Less output with UF/UV cartridge)			
	<b>Pure water outlet</b>	High pure, Ultra pure water			
	<b>Dimension / Weight / Power</b>	WxDxH:54x36x50cm/ 30-20 Kg/ 220V/50HZ, 120W			
<b>Control system</b>	<b>Mode display</b>	Power on, program, inlet rinse, producing, full, circle, regular outlet, disinfection, consumables replacing reminder			
	<b>Safety</b>	low pressure and full water alarm, password, auto-reset, outlet forbidden when alarm or disinfection			
	<b>System monitor</b>	Monitoring quality of inlet water, RO water and ultrapure water, temperature, used and left time of consumables			
<b>Water source required</b>		Ro water, distilled water, deionized water.5-45°C,1atm*			
<b>Purification system</b>		Post active carbon filterx+1Mixed bed resin cartridgex+1Ultra pure polishing resin cartridgex +4 0.2µm terminal filterx1 UV model:+Double wavelength(254&185 nm)UV cartridgex1 UF model:+ 5000 Doulton UF cartridgex1 UVF model:+Double wavelength(254&185 nm)UV cartridgex5000+1 Doulton UF cartridgex1			
<b>Standard configuration</b>		Main body(including:1 set cartridge)			

\* The quality of inlet water will effect output's and cartridge's life.  
AC: Active carbon, DI: Ion exchange, UV: Ultraviolet (Double wavelength: 254&185nm),  
UF: Ultrafiltration TF: Terminal filter.

## Consumable &amp; accessories of WPL Series

Model	Specs	Replacement term
171-2-000030	5µm spun fiber filter	About 2-6 months
171-2-000031	Long-effective KDF filter	About 1 year
171-2-000032	Granular active carbon filter	About 6 months
171-2-000033	Post active carbon filter	About 9000 Liters water
171-2-000034	10" PP filter	About 2-6 months
171-2-000035	10" KDF filter	About 1 year
171-2-000036	10"granular active carbon filter	About 6 months
171-2-000037	100 GPD RO membrane	About 1-2 years
171-2-000038	Mixed bed resin cartridge	About 1000L water
171-2-000039	Ultra pure polishing resin cartridge	About 1000L water
171-2-000040	5000 Doulton UF cartridge	-
171-2-000041	0.2µm terminal filter	About 1 year
171-2-000042	254nm UV cartridge	-
171-2-000043	254 nm lamp	About 9000 hours
171-2-000044	Double wavelength (185&254nm)UV cartridge	-
171-2-000045	185&254 nm UV lamp	About 9000 hours



RO-UP Digital System

## WPB Series, Water purification systems

- **WPB-RO** Series reverse osmosis pure water system (Tap water inlet)
- **WPB-RO-DI** Series deionized water system (Tap water inlet)
- **WPB-Ultra** Series ultra pure water system (Tap water inlet)
- **WPB-Research** Series ultra pure water system (DI water inlet).



RO-DI System

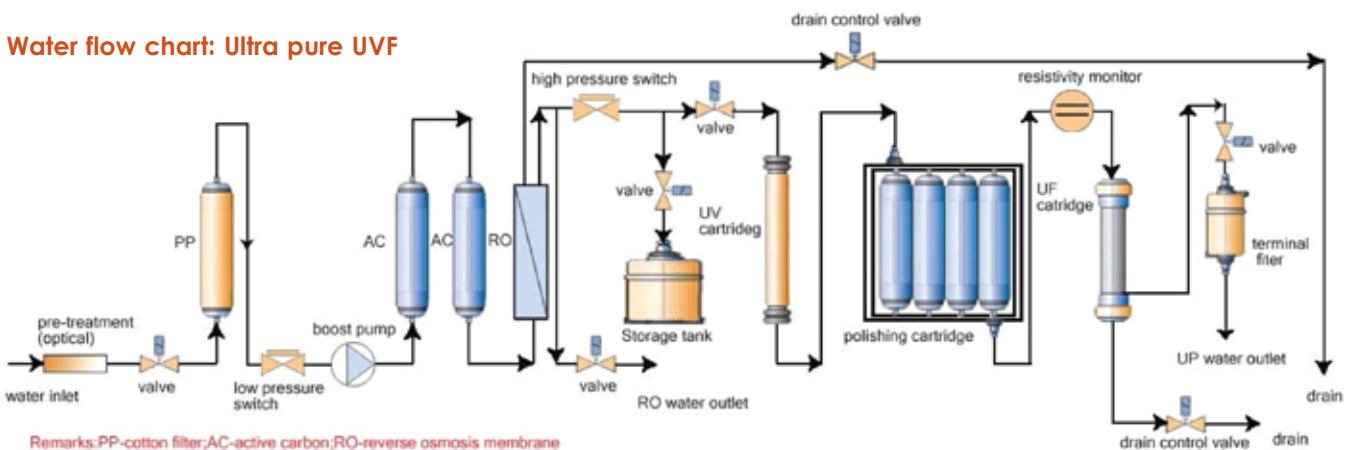


RO-DI Digital System



RO System

## Water flow chart: Ultra pure UVF



Remarks: PP-cotton filter; AC-active carbon; RO-reverse osmosis membrane

**WPB-RO-(HP) Systems, Pure water systems (Tap water inlet)**

Model		WPB-RO-15	WPB-RO-30	WPB-RO-HP-15 (D)****	WPB-RO-HP-30 (D)****
<b>Flow procedure</b>		PF+AC+RO+AC	PF+AC+RO+AC	PF+AC+RO+DI	PF+AC+RO+DI
<b>Application</b>		<ul style="list-style-type: none"> <li>• ware washing • Agricultural • General biological • Aquatic products feeding • Inlet water for Ultra pure water machine • Inlet water for sterilizer/T&amp;H chamber</li> </ul>		<ul style="list-style-type: none"> <li>• Buffer disposing • Aseptic drinking water • Physical &amp; chemical analysis • Fine chemistry industry • Inlet water for Ultra pure water machine • GC/HPLC</li> </ul>	
<b>Purification system</b>	<b>Pretreatment unit</b>	Pre-filter (optional)+Special spun fiber filter×1+ Special active carbon block filter×1+Special active carbon block filter×1			
	<b>RO unit</b>	100GPD RO membrane	2×100GPD RO membrane	100GPD RO membrane	2×100GPD RO membrane
	<b>Subsequent unit</b>	Post active carbon filter×1		Mixed bed resin cartridge×2	Mixed bed resin cartridge×3
<b>Pure water quality</b>	<b>Desalination rate%</b>	96-98*		Nearly 100*	
	<b>TDS</b>	5-10 ppm		RO water: 5-10 ppm	
	<b>Resistivity</b>	-		15-18.2MΩ-cm	
	<b>Conductivity</b>	-		0.055-0.067μs/cm	
<b>Pure water outlet</b>		RO Water		RO Water, Deionized water	
<b>Control system</b>		Automatic electronic pressure sensor controlling, RO membrane auto flushing, automatic stop without water, automatic stop when water tank full, automatic cutting off water when pump stopping, guaranteeing 24 hours' work.			
<b>Water quality monitor</b>		TDS test pen		TDS test pen + LCD online resistivity monitor	
<b>Inlet water requirement</b>		Tap water:TDS<200ppm,5-40°C,1.0-3.5Kg/cm <sup>2</sup>			
<b>Output(25°C)</b>		15 Liters/hour*	30 Liters/hour*	15 Liters/hour*	30 Liters/hour*
<b>Instantaneous output</b>		1.5 L/min (with pressure tank)			
<b>Power</b>		220V/50Hz, 48W plus model:72W			
<b>External dimension/Weight</b>		H×W×D:42×41×22cm / 12-14kg			
<b>Standard configuration</b>		Main body(including:1 set cartridge)+3.2gallon tank			

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate. \*\* GPD=gallon per day 1gallon=3.8L.  
 \*\*\* The quality of inlet water will effect output's & cartridge's life. PF: Pretreating, AC: Active carbon, RO: Reverse osmosis, DI: Ion exchange. \*\*\*\* Digital display option.

**WPB-UP Systems, Ultra pure water systems (DI water inlet)**

Model		WPB-UP-S	WPB-UP-UF	WPB-UP-UV	WPB-UP-UVF
<b>Specification</b>		Standard	Eliminating endotoxin	Low TOC	Comprehensive
<b>Flow procedure</b>		AC+DI+TF	AC+DI+UF+TF	AC+DI+UV+TF	AC+UV+DI+UF+TF
<b>Application</b>		<ul style="list-style-type: none"> <li>• Microanalysis</li> <li>• Environmental analysis</li> <li>• AA,ICP,IC</li> <li>• Buffer disposing</li> <li>• Pharmacy research</li> <li>• Medicine examining.</li> </ul>	<ul style="list-style-type: none"> <li>• Molecular biology</li> <li>• PCR, gene research</li> <li>• Pharmacy research</li> <li>• Medicine examining,</li> <li>• Cell cultivating,</li> <li>• IVF etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Micro organic analysis</li> <li>• Environmental analysis</li> <li>• HPLC,TOC, VOC, GC/MS</li> <li>• Pharmacy research</li> <li>• Medicine examining.</li> </ul>	<ul style="list-style-type: none"> <li>• Molecular biology</li> <li>• Micro organic analysis</li> <li>• Environmental analysis</li> <li>• Pharmacy research</li> <li>• Medicine examining</li> <li>• Cell cultivating</li> <li>• IVF etc.</li> </ul>
<b>Inlet water</b>		Ro water, distilled water, deionized water			
<b>Purification system</b>		Post active carbon filter×1+Mixed bed resin cartridge×1+Ultra pure polishing resin cartridge×4+0.22μm terminal filter×1 UV model:+Double wavelength (185&254 nm) UV cartridge×1 UF model:+ 5000 Doulton UF cartridge×1 UVF model:+Double wavelength(185&254 nm) UV cartridge×1+5000 Doulton UF cartridge×1			
<b>Pure water quality</b>	<b>Resistivity</b>	18.2 MΩ-cm @25°C			
	<b>Heavy metal</b>	<0.1ppb			
	<b>TOC</b>	<10ppb		<5 ppb	
	<b>Endotoxin</b>	-	< 0.001Eu/ml	-	< 0.001Eu/ml
	<b>particle(&gt;0.22μm)</b>	<1/ml			
	<b>Bacteria</b>	<1cfu/ml			
<b>Pure water outlet</b>		High pure, Ultra pure water			
<b>Control &amp; display system</b>		Automatic electronic pressure sensor controlling, recirculation function; LCD online resistivity monitor.			
<b>Output(25°C)</b>		1.0 - 1.3 Liters/min (with pressure tank) (Less output with UF/UV cartridge)			
<b>Power</b>		220V/50Hz, 72W			
<b>External dimension/Weight</b>		H×W×D:42×41×22cm / 12-14kg			
<b>Standard configuration</b>		Main body(including:1 set cartridge)			

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate. \*\* GPD=gallon per day 1gallon=3.8L.  
 \*\*\* The quality of inlet water will effect output's and cartridge's life. AC: Active carbon, DI: Ion exchange, UV: Ultraviolet (Double wavelength:254&185nm), UF: Ultrafiltration, TF: Terminal filter.

## WPB-RO-UP Systems, Ultra pure water systems (Tap water inlet)

Model		WPB-RO-UP-15-S WPB-RO-UP-30-S	WPB-RO-UP-15-UF WPB-RO-UP-30-UF	WPB-RO-UP-15-UV WPB-RO-UP-30-UV	WPB-RO-UP-15-UVF WPB-RO-UP-30-UVF
<b>Specification</b>		Standard	Eliminating endotoxin	Low TOC	Comprehensive
<b>Flow procedure</b>		PF+AC+RO+DI+TF	PF+AC+RO+DI+UF+TF	PF+AC+RO+UV+DI+TF	PF+AC+RO+UV+DI+UF+TF
<b>Application</b>		<ul style="list-style-type: none"> <li>• Microanalysis</li> <li>• Environmental analysis</li> <li>• AA,ICP,IC</li> <li>• Buffer disposing</li> <li>• Pharmacy research</li> <li>• Medicine examining.</li> </ul>	<ul style="list-style-type: none"> <li>• Molecular biology</li> <li>• PCR, gene research</li> <li>• Pharmacy research</li> <li>• Medicine examining,</li> <li>• Cell cultivating,</li> <li>• IVF etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Micro organic analysis</li> <li>• Environmental analysis</li> <li>• HPLC, TOC, VOC, GC/MS</li> <li>• Pharmacy research</li> <li>• Medicine examining.</li> </ul>	<ul style="list-style-type: none"> <li>• Molecular biology</li> <li>• Micro organic analysis</li> <li>• Environmental analysis</li> <li>• Pharmacy research</li> <li>• Medicine examining</li> <li>• Cell cultivating</li> <li>• IVF etc.</li> </ul>
<b>Purification system</b>	<b>Pretreatment unit</b>	Pre-filter (optional) Special spun fiber filter (30L model: outside 10" spun fiber filter)x1+Special active carbon block filterx1+Special active carbon block filterx1			
	<b>RO unit</b>	100GPD RO membranex1 (30L model: 2x100GPD RO membrane)			
	<b>Subsequent unit</b>	Ultra pure polishing resin cartridgex 0.22+4µm terminal filterx1 UV model:+Double wavelength(254&185 nm)UV cartridgex1 UF model:+ 5000 Doulton UF cartridgex1 UVF model:+Double wavelength(254&185 nm)UV cartridgex5000+1 Doulton UF cartridgex1			
<b>Pure water quality</b>	<b>Resistivity</b>	18.2 MΩ-cm @25°C			
	<b>Heavy metal</b>	<0.1ppb			
	<b>TOC</b>	<10ppb		<5 ppb	
	<b>Endotoxin</b>	-	< 0.001Eu/ml	-	< 0.001Eu/ml
	<b>particle(&gt;0.22µm)</b>	<1/ml			
	<b>Bacteria</b>	<1cfu/ml			
<b>Pure water outlet</b>		RO Water, Ultra pure water			
<b>Control system</b>		Automatic electronic pressure sensor controlling, RO membrane auto flushing, automatic stop without water, automatic stop when water tank full, automatic cutting off water when pump stopping, guaranteeing 24 hours' work.			
<b>Water quality monitor</b>		TDS test pen + LCD online resistivity monitor			
<b>Inlet water requirement</b>		Tap water:TDS<200ppm,5-40°C,1.0-3.5Kg/cm <sup>2</sup>			
<b>Output(25°C)</b>		15/30 Liters/hour*			
<b>Instantaneous output</b>		1.5 L/min (with pressure tank) (Less output with UF/UV cartridge)			
<b>Power</b>		220V/50Hz, 48W/ plus model:72W			
<b>External dimension/Weight</b>		HxWxD:42x41x22cm / 12-14kg			
<b>Standard configuration</b>		Main body(including:1 set cartridge)+ 3.2gallon tank			

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate.

\*\* GPD=gallon per day 1gallon=3.8L.

\*\*\* The quality of inlet water will effect output's and cartridge's life. PF:Pretreating, AC: Active carbon, RO:Reverse osmosis, DI: Ion exchange, UV:Ultraviolet(Double wavelength:254&185nm), UF:Ultrafiltration, TF:Terminal filter.

### Consumables & accessories:

Model	Specs	Replacement term
171-2-000050	Special spun fiber filter	2-6 months*
171-2-000051	Special active carbon block filter	4-6months*
171-2-000052	Post active carbon filter	1 year*
171-2-000053	100 GPD RO membrane	1-2 years
171-2-000054	Mixed bed resin cartridge	Around 1000L
171-2-000055	Ultra pure polishing resin cartridge	Around 1000L
171-2-000056	0.22µm terminal filter	
171-2-000057	TDS test pen	
171-2-000058	5000 Doulton UF cartridge	
171-2-000059	Double(185&254nm) wave length UV cartridge	Lamp: about 9000h
171-2-000060	Double (185&254nm)wave lamp	About 9000h
171-2-000061	pre-filter	10"PP+resin soften water filter
171-2-000062		10"PP filter
171-2-000063		10"soften water resin filter

Remarks: \* Replace term of Plus model will be decreased.

\*\* When inlet water's TDS>200ppm, Replace term of filter will be suggested to decrease,or outside pre-filter is added. Or water quality and life of ultra pure cartridge will be affected.



**WPG-100/200 Series, Water purification systems**



**WPG-100**



**WPG-200**

Model		WPG-100	WPG-200
<b>Flow procedure</b>		PF+AC+RO+DI	
<b>Application</b>		<ul style="list-style-type: none"> <li>• ware washing • Agricultural • General biological • Aquatic products feeding</li> <li>• Inlet water for Ultra pure water machine • Inlet water for sterilizer/T&amp;H chamber</li> <li>• Buffer disposing • Aseptic drinking water • Physical and chemical analysis • Fine chemistry industry</li> </ul>	
<b>Pure water quality</b>		Resistivity of deionized water:>10MΩ-cm, Desalination rate%:Nearly 100*, TDS (total dissolved solid) of RO water 5-10 ppm*	
<b>Output</b>		15 Liters per hour *	30 Liters per hour *
<b>Water quality monitor/ Pure water outlet</b>		TDS (total dissolved solid)test pen/ RO Water, Deionization water	
<b>External dimension/Power/Weigh</b>		WxDxH:41x32x42cm / 220V 50Hz / About 15Kg	
<b>Inlet water requirement</b>		Tap water :TDS<200ppm, 5-40°C, 1.0-3.5Kg/cm2	
<b>Purification system</b>	<b>Pretreatment unit</b>	10" PP spun fiber filterx1+10" granular active carbon filterx1+10" active carbon block filterx1	
	<b>RO unit</b>	100GPD RO membrane x 1	100GPD RO membrane x 1
	<b>Subsequent unit</b>	Mixed bed resin cartridge-Dx2	Mixed bed resin cartridge-Dx3
<b>Standard configuration</b>		Main body (including:1 set cartridge)	

\* Inlet water: TDS200ppm, 25°C, 50psi and 15% recovery rate.

\*\* GPD=gallon per day 1 gallon=3.8L.

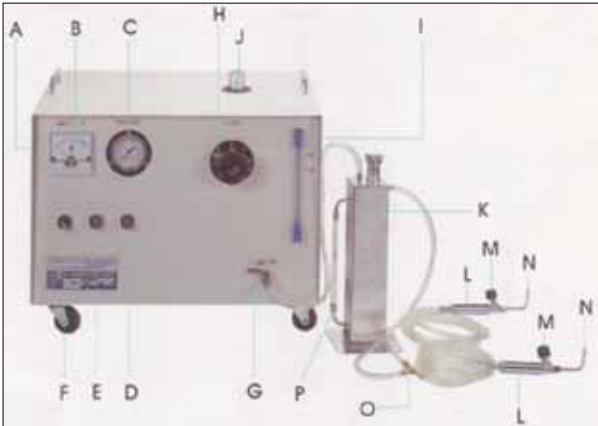
\*\*\* The quality of inlet water will effect output's and cartridge's life. PF: Pretreating, AC: Active carbon, RO: Reverse osmosis, DI: Ion exchange.

**Consumables & accessories:**

Model	Specs	Replacement term
171-2-000070	10" PP spun fiber filter	About 4-6 months*
171-2-000071	10" granular active carbon filter	About 4-6 months*
171-2-000072	10" active carbon block filter	About 4-6 months*
171-2-000073	100GPD RO membrane	About 1-2 years
171-2-000074	Mixed bed resin cartridge-D	About 1000Liters



**FWW-270**



- A. Cooling fan
- B. Input a meter
- C. Gas pressure gauge
- D. Tank hi pressure cut off pilot
- E. Power on pilot
- F. Power switch
- G. Gas out valve
- H. Output adj.
- I. Electrolyte tank sight glass
- J. Di water add port
- K. Booster
- L. Diffusion stone pipe
- M. Flame adj. valve
- N. Torch tip
- O. Three way connection
- P. Booster sight glass

**Applications:**

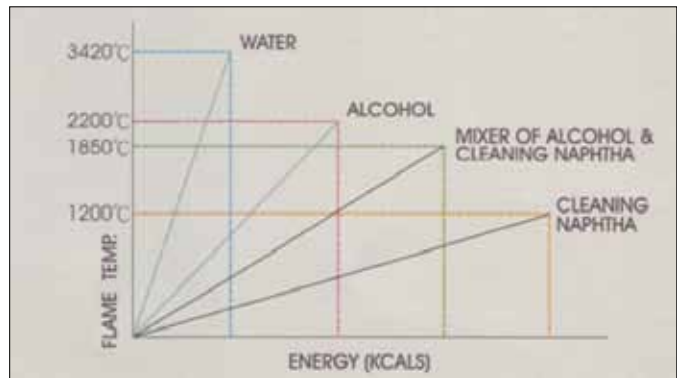
- Metal welding: lead-tin soldering, gold, silver, copper, brass brazing, for spot & plate welding, such as ear-ring, necklace, chains, finger ring, etc.
- Glass process: ampoule sealing, quartz glass process, mercury switch sealing, glass capillary tube forming, bending, etc.
- Motor industry: stator copper-thread welding and no need to peel the cover.

**FWW-Series, High Temp. Flame Water Welders**

Just add di-water & plug the plug. Then you can get the mixed gas of hydrogen & oxygen which pass through the fan to condense water vapor. The functions of booster are to add the enthalpy, to reduce the flame temperature, to rise the pressure of gas and to increase the energy. It's a very economical method to have a hi-temperature flame.

**Features:**

- Fuel are water, electric power & a little of solvent. Easy to get and storage safety.
- $2H_2+O_2$  burn  $2H_2O$  (vapor). the vapor left from burning is non toxic and non pollution.
- Good designed machine constructor, for continuous operation.
- Torch with built-in diffusion stone, pressure switch, over-pressure relieve valve, to protect the machine absolutely safety.
- Flame temperature range is up to  $3420^{\circ}C$  or can be down to  $1200^{\circ}C$ .
- Easy to change the flame size especially in very fine flame usage area. Tip orifice size are from 0.076mm <math>(30\#)</math> to 1.056mmct (16#).
- Compact and easy operation.



**Booster's Function Diagram**

- Hi-melting point metal welding: thermal couple thread welding, led plate connecting, computer stripping teflon tape cable cover peeling and cutting. gold wire ball bonding.
- Sun glasses hinge's welding.
- Acrylic surface or edge flame polishing.
- Tooth mold pin hole mending.
- Lead acid battery electrode plate welding.
- Heat treatment for small part and precise craft.

Model	FWW-270	FWW-640	FWW-1200	FWW-1600
<b>Max. KCAL Output</b>	270 Kcal/hr	430 Kcal/hr	800 Kcal/hr	1600 Kcal/hr
<b>Max. Power Input</b>	400 watts	640 watts	1200 watts	2400 watts
<b>Max. Torch Tip Orifice</b>	No.21	No.20	No.19	No.18
<b>Electrolyte Capacity</b>	1.6e	3e	6e	10e
<b>DI Water Consumption Rate</b>	0.02e/hr	0.035e/hr	0.06e/hr	0.12e/hr
<b>DI Water Addition Interval</b>	8hr	8hr	8hr	8hr
<b>Power</b>	110/220V 50/60 Hz 1ϕ	110/220V 50/60 Hz 1ϕ	110/220V 50/60 Hz 1ϕ	110/220V 50/60 Hz 1ϕ
<b>Packing Dimension(mm)</b>	W370xD370xH340	W510xD410xH400	W580xD500xH560	W680xD540xH560
<b>(N.W)</b>	24kgs	34kgs	55kgs	67kgs
<b>Solvent Consumption Rate (BOOSTER)</b>	0.005e/hr	0.009e/hr	0.015e/hr	0.03e/hr
<b>NO. Of Simultaneous Operation Torch With # 21 Tip</b>	1	2	4	6



TCW-60

**Standard Accessories:**

- Wire Holding Pliers & Lead.
- Safety Glasses.
- Magnifying Eyeglass.
- Carbon Electrodes.
- Spare 2A Fuse.
- Argon Hose.
- Mains Lead.
- Footswitch for greater ease of use.

**Optional Accessories:** Spare Carbon Electrodes.

**Electrical:**

Power Supply: 110-120 Vac or 220-250 Vac, 50-60Hz.  
Power Consumption: Power Consumption.

**General:**

<b>Energy Output</b>	0-60 Joules
<b>Welding Capacity</b>	Wires up to 1.1mm diameter
<b>Duty Cycle</b>	Minimum 5-10 welds/min

**Ordering Guide:**

Typical Part No. TCW-60, -220-250Vac.

**Mechanical:**

<b>Physical Dimensions</b>	(WxHxD) 220x120x250mm
<b>Weight</b>	4kg

**TCW-60, Thermocouple Welder**

The TCW-60 is designed for sensor manufacturers for the production of commercial grade thermocouple junctions, and for users of large numbers of exposed junction thermocouples such as test & development laboratories where multipoint temperature sensing of test pieces is required.







No special skills are needed and most people will be capable of producing quality work with minimal practice. The instrument can be operated via the front panel or by using the footswitch provided.

In addition to thermocouple work, the TCW-60 welder is used in many other applications involving the joining of wires to each other and to metal surfaces.

This model is suitable for welding wires up to 1.1mm diameter & has an argon gas shield facility.

A satisfactory thermocouple junction is produced without using argon, but where argon is available a momentary purge is automatically triggered immediately prior to the weld to give optimum weld integrity.

**Thermocouple Connectors**

	<b>1260-K</b> mini plug type K		<b>1260-T</b> mini plug type T		<b>1010-K</b> standard jack K
	<b>1210-K</b> mini jack type K		<b>1210-T</b> mini jack type T		<b>1060-K</b> standard plug K

**Insulated Thermocouple Wires**

Code	T/C Type	Insulation	Wire Diameter (mm)	Temp. Limit
	K-20-2-304 K-24-2-304 K-30-2-304	Glass Silicon	0.813 0.508 0.254	480°C (540°C)
	K-24-2-508 K-30-2-508	Teflon	0.508 0.254	204°C (260°C)
	K-24-2-508 K-30-2-508 K-36-2-508	Teflon	0.508 0.254 0.125	204°C (260°C)

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**CALO-13** **Calorimeter** Page 102

Calorimeter can be used to determine the calorific value of coal, coke, petroleum, cement black meal, solid biomass fuels and other combustibles.

- High Adaptability to Environment Stable internal environment
- High Precision and Accuracy of Test Results Independent bucket and jacket water system
- Constant bucket water volume & temp.



**FA-46** **Fat Analyzer** Page 6

Fat Analyzer is based on the Soxhlet extraction principle and integrates such functions as soaking, extraction, leaching, heating, condensation and solvent recovery. It features sealed metal bath heating with automatic temperature control.



**GC3420A** **Gas Chromatograph** Page 147

- Self-diagnostic function
- Self-protective function.
- Simple operation, powerful automation.
- More choices of injectors.
- Reactor.
- Time programming of external events
- Many kind of special-purpose GC can be provided according to user's request.



**BODT-5** **BOD Tester** Page 423

It takes significant steps to do away with the weaknesses of biosensor BOD measuring apparatus entailed by trouble and time required to replace and load microbe membrane and with an exchangeable electrode. Easy to use.



**MPA-1** **Melting Point Apparatus** Page 422

Digital Melting Point Apparatus is integrated with photoelectric detection, digital temp. display and other technologies, boasts automatic display of initial and final melts and other functions. In the temperature.



**HPLC8100** **Liquid Chromatograph** Page 148

Scientific and reasonable function and structure design satisfy your needs for accuracy and reproducibility to the maximum. Building-block modular design enables easy use & convenient maintenance.



**HOG-24** **Top Speed Homogenizer** Page 327

Fast, effective and reproducible homogenization of a wide range of samples, including hard to lyse tissues and cells. It also holds extraordinary powerful processing of even impact resistant samples such as bones or cartilage.



**FP-26A** **Automatic Flash Point Tester** Page 259

It is used to determine the lowest temp. of a petroleum product sample when the mixture of sample vapor & air around the sample contacts flame & flashes when heated in a closed cup under stipulated condition. The lowest temper. is the flash point of the sample.



**AKA-11** **Automatic Kjeldahl Analyzer** Page 4

Auto Kjeldahl analyzer is an automatic device integrating distillation and titration functions designed based on classic Kjeldahl nitrogen determination method.



**PCRS-500** **Smart Gradient PCR** Page 642

Convenient and flexible module replacement mode • Sealed sample design for low temperature preservation, clean and dry • Two-stage hot lid pressure regulator, ensures good sealing performance • Gold-plated or silver-plated module, improves the efficiency of heat conduction, makes the experiment more effective.



**OSM-9** **Osmometer** Page 499

OSM-9 is a compact micro processor controlled analyzer for easy and precise osmolality tests in samples of serum, plasma, urine or other body fluids. It has hi-tech user interface.



**DustMatic-2000** **Dust Drawer** Page 205

A dust-suction drawer of optimal quality and design, featuring innumerable advantages and improvements in almost all fields of operation, efficiency, user-friendliness, etc.

- Operation is fully automatic.
- Ergonomic design and construction with first quality materials.



**REAC-Series** **Reactors** Page 570

Glass reactors or mixing vessels are frequently used for stirring, dissolving, mixing, extraction and other processes in labs and pilot plants. Jacketed models permit heat exchange for better dissolving and crystallization. They can also be equipped with condensers for vacuum distillation.



**WBSD** **Polycarbonate & S.S Thermostatic Baths** Page 67

Ideal for sample pre treatment in QC, pathology and educational purposes, routine laboratory purposes, procedures requiring visibility of reactions inside the vessels & as a 'personal' water bath for scientists needing only a small working area with a compact footprint.



**LF30** **47mm PES Filtration Sets** Page 255

- Spin-lock connection facilitates fast and stable installation without clamp
- PES structure offers excellent smash and high temperature
- Waste bottle built in spill-proof buoy
- Funnel graduated in 50ml, receiver in 100ml increments.



**CLRM-200** **High Quality Colorimeter** Page 169

**High Quality User Interface and Convenient Operation**

- One-Touch Access to the Measurement Interface.
- Structure Design in line with Ergonomics.
- Easy-to-use User Interface.



**BDI-Series** **DispensMate Plus** Page 175

**Bottle-Top Dispenser**

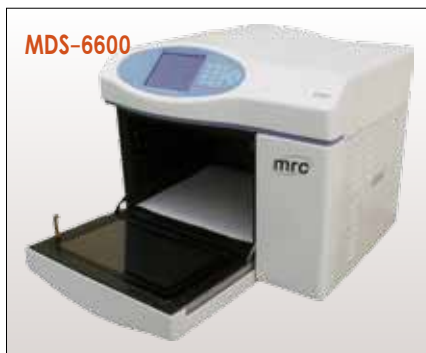
- Excellent chemical resistance • Fully autoclavable at 121°C • Four ranges of bottle-top • Easy to clean & maintain
- The optional flexible discharge tube
- Made of PTFE, FEP, BSG, PP • Vapor pressure Max. 500 mbar.



**LCEN-401** **Digital Clinical Centrifuge** Page 107

Clinical centrifuge is ideal for separation of serum, plasma, urea, blood samples and other routine applications in hospital and research laboratories.

Advantages: Precise control, Ergonomic design. 8 tubes 15ml.



**MDS-6600** **Microwave Digestion System** Page 158

The activation characteristic of microwave enables easier sample dissolution and chemical reaction. Combined with sealed container to increase pressure and temperature, it greatly increases the speed of chemical reaction and shortens the sample preparation time to 1/10 of traditional method.



**PMG-100** **Power Mortar Grinder** Page 478

• Dry Grinding / Wet Grinding / Ultra Fine Grinding / Cryogenic Grinding • Mixing • Cell disruption for DNA / RNA extraction • The PMG-100 can handle samples from 10 up to 200ml • High operator convenience and maximum safety.



**SM-450** **Sample Mills** Page 476

• Compact size  
• Users can take off the container unit for dry cleaning after using  
• Useful to crush dried food, drugs, alumina, bones, grains, seeds, porcelain, mineral etc.  
• Temperature inside can be reduced inside the container.  
• Optional: -transparent lid.  
-Lid for small quantities.



**DW-86HW50** **Small Chest Freezer** Page 267

The Ultra-low Temperature Freezer offers a wide variety of research & storage applications, such as low temperature scientific experiments, preservation of plasma, biomaterial, vaccine, biomedical product, and testing low-temperature-resistant properties of products.



**HOG-500-1** **BenchTop Homogenizer** Page 324

Philosophy made simple, so easy to handle. Ability to achieve quality results fast. It has the speed and power to emulsify, suspend, cut-up and disrupt to yield accurate results every time. Full flexibility as hand-held, post or wall mounted, with H-stand or plate-stand support.



**PCM-200** **Power Cutting Mill** Page 485

• Rapid reduction of large particles from 80 mm to 0.25 mm • Quick and easy cleaning • Full range of bottom sieves • Collector volume 5,000 ml • Digital speed setting.



**ASX-Y Series** **Analytical Balances** Page 29

ASX/Y type has been designed on the basis of new electronic modules & up-to-date technology. It assured by internal calibration triggered by time flow or temp. conditions. They are equipped with spacious weighing chamber with opened side glass doors.



**MGB** **Mass Comparator** Page 56

Mass comparators are devices designed for determining the differences between masses of calibration weight (B) and reference weight (A). Comparators are most often used in measuring laboratories for calibration of weights and masses.



**ROVA-100** **Digital Rotary Evaporator** Page 580

Easy to read large digital LCD screen displays. Large 5L water-oil heating bath with heating temperature range RT to 180°C. Heating bath with precise temperature control and adjustable safety circuit. Designed a detachable operating panel allows remote control.



**LOM-175-Dual** **Orbital Dual Shaking Incubator** Page 365

- Useful for biological culture under various temp
- Inside material is SUS304 & outside body is powder painting
- Screen-touch panel
- The compressor will be delayed to start working if power cut and with timer for defrost
- With safety switch to stop shaking when opening door
- Minimum noise, no vibration
- Optional day/night light with timer.



**LOM2-8043** **Premium Stackable Shaking Incubator** Page 367

MRC now can offer new space-saving incubator shakers. This LOM - Series shaker (touch screen) can be stacked up to three units high, providing laboratory professionals tripled culture capacity, while still only occupying the same "footprint" of a single shaker. All models feature an insulated, fold-down door with double-layer glass window for high visibility.



**LE-80FLED** **LED Environment Incubator** Page 386

With his compact size the LE-80FLED is the perfect tool to study in a little space the effect of the LED light on the physiognomy of the plant. The Environment of the plant is completely controllable. Temperature, RH, Photo period, (CO2 control).



**DFI-xxxN Series** **Precise Incubators** Page 349

Precise incubating, Micro-processor based temperature controller up to  $\pm 0.1^{\circ}\text{C}$ . Patented ventilator featured with safe & easy access for exhausting of damp and fume, fast cool-down and ultra-low intrinsic temperature close to ambient.



**CCG-100** **Temp. & Humid. Chamber** Page 234

- Airduct structure
- Electronic humid. sensor
- Innovative refrigerating system
- Easy for maintenance
- RS232 interface
- Pondered water inside inner bag can be discharged easily.



**LE-250B** **Testing Chamber, Temperature, Humidity, Light** Page 380

- Airduct structure
- Touch screen
- High precision electronic temp. sensor
- Innovative refrigerating system
- Illumination effect
- Test hole+ RS232 interface.



**HC6-2** **Standard Humidity Cabinet** Page 357

MRC Humidity Test Cabinets provide a controlled environment for a wide range of industrial & biotechnology testing applications. This line is designed to duplicate a natural condition.



**TOUR-120-2** **Orbital BenchTop Refrigerated Shaker-Incubator** Page 363

- Constant speed & temperature mode
- Advanced shaking mechanism provides quiet shaking & precise speed control
- Min. noise & no vibration
- Automatic stop of shaking, when the door is opened
- Universal spring rack.



**LOM-65** **Orbital Shaking Incubator** Page 362

Space saving with transparent window in the front which provide good visibility that minimize the need to open the chamber, automatic cutout of shaker when lid is open to protect operator. Automatic stop of shaking, when the door is opened.





**WG-6090 Professional Washer** Page 678

WG-6090 is a machine with a high loading capacity capable of handling large quantities of material in a short space of time & of washing large-sized Optional instruments. Washing chamber 670x650x835mm (three times the useful volume of medium-sized machines). Able to load up to three direct injection glassware levels or 3 levels with rotating spray arms.



**WPL-RO Deionized Pure Water Systems** Page 715

- RO Series uses the reverse osmosis technology of NASA. Desalination rate ≥ 99%, eliminating virus rate ≥ 99.5%
- Special circle-inside function to guarantee water quality
- II mixed beds guarantees water quality and increase the life-span of ultra purification cartridge.



**HSD-135 Digital Magnetic Hotplate Stirrer** Page 342

- LED-Display for accurate regulation of speed and temperature
- digital controlled speed and temperature
- Indicator for hot surface, even when the stirrer is shut-off integrated temperature control function
- compact construction, sealed housing.



**0003 Auto Dry Keepers** Page 199

- Full automatic system
- Functions and strength are improved markedly by combining molded parts
- Dehumidification capability is improved substantially by adoption of a fan for inside air circulation convection flow
- Shelf plates can be adjusted in 15 steps at 28mm
- Slim vertical type design does not take up space.



**SI-1401 Benchtop Shaking/Rotating Incubator** Page 372

- Compact and lightweight
- Holds almost any container at any angle
- Available for increased capacity and different containers
- Viewing Window
- RS232 interface
- Economical, Space Saving & Secure
- 3-D Shaking Incubator.



**MUSH-10 10-Channel Magnetic Hotplate Stirrer** Page 343

- High-performance multi-position magnetic stirrer with uniform temperature distribution
- Individually controlled stirring for consistency with various samples
- Electronic speed control motor provides constant speed.



**DBR-002 COD Thermoreactor** Page 196

It features six pre-set common programs to ease the lab work. It also allows user-tailored program for repeated custom procedures. The digital display provides precise temperature setting. Safety-first philosophy design.



**ARIMAD-3000S Plant Water Potential** Page 452

Pressure chamber method demonstrating the plant's reaction to moisture excess or deficiency. Enables adjustments of irrigation schedule. ARIMAD keeps you in touch with your crop's water status!



**MHK-1/2x3 500°C Ceramic 6 Position** Page 345

Multi position hotplate stirrer with six positions (in 2 rows 3+3). Temperature range: Up to 500°C. Speed control: Up to 1600RPM.



**S-50 Conical tube Mixer Page 612**

- Variable speed range: 60–500rpm
- Orbit of 6mm in low speed & orbit of 40mm in high speed
- High quality permanent DC brushless motor for gentle and powerful motion
- Continuous or timed operation
- Rack for 50ml conical tube: 12ea or Rack for 15ml conical tube: 18ea.
- LED display (Shown actual speed or time).



**CCG Series Safety Cabinets Page 596**

- Double-wall cabinet construction with thickness of 1.2mm steel and 38mm air space efficiently isolates from combustion.
- Provides workers and environment optimum safety and quality assurance.
  - Provides maximum property and asset protection.
  - Prevents explosion, extension of a fire.



**SI-1601 Orbital Shaker Page 604**

- Choice of THREE different units depending on preferred platform.
- Variable shaking speed with orbit REVERSING.
- Fully programmable – time, reversing time, and acceleration/deceleration rates.
- Create any mixing action from a smooth vortex to sloshing aeration (or anything in between).



**KOS-3333 Orbital Shaker Page 605**

- Orbital Digital Shaker provide smooth and quiet motions for mixing in culture dishes, flasks and beakers.
- Compact
  - LCD displays speed and timer
  - Electronic time switching clock
  - DC brushless motor
  - Over speed detection & protection.



**TALS-200 Sieve Shaker Page 616**

- TALS model is a multi-purpose sieve shaker that was developed at our Company and incorporates many improvements allowing it to handle most of the problems that usually arise in sieving all kinds of materials.



**SI-600 Multi-Tube Vortexer Page 666**

- Compact design, benchtop Mix-Smart can be used for virtually any mixing applications. It accommodates micro test tubes, PCR plates, deepwell plates and MTPs. The Mix-Smart only takes up an area of 17×24 cm, less than the size of this A4 paper.



**COMP-61x Silent Oil Free Air Compressors Page 166**

- Super silent
- Low vibration
- Pure air flow
- Core technology
- Fashion and durable design
- Use safety
- Easy operation
- Low energy consumption
- High precision filtration
- Tank inside has done anti-rust treatment.



**STO-4 Stomacher Blender Page 91**

- stomacher is specifically used for microbial extraction. Updated with LCD display which shows running state like speed, time, program. has been found useful with a wide variety of samples, particularly: solid & semi-solid products, fresh & processed meat...



**M714-14L Bead, waterless Baths Page 81**

- MRC beads by design, provide a concurrent thermal and antimicrobial activity that efficiently shields the lab and personnel from invading organisms while thermally heating and cooling like water in any standard water bath or heat block.