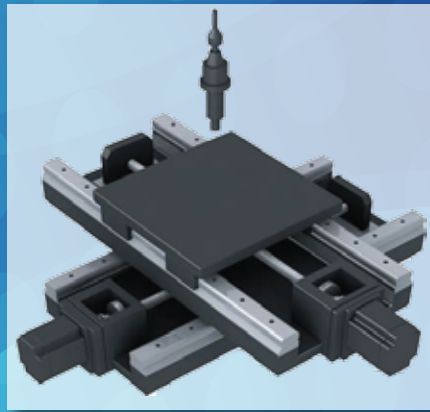


# Motorized & Manual Stages



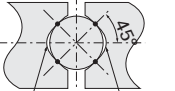















**mrc**

## Motorized Linear Stage Lineup

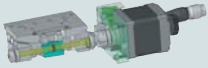


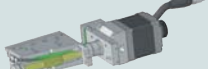


X-axis [XY-axis·Z-axis·XYZ-axis]

Horizontal Z-axis

Travel guide	Model
	<b>KXT</b> 
	<b>PG</b> 
<b>Linear ball guide</b>  Gothic-arch Groove Gothic-arch Groove ▶ P.1-017 KXT ▶ P.1-021 PG ▶ P.1-041 KXG ▶ P.1-055 KXL	<b>KXG</b> 
	<b>KXL</b> 
	<b>KXC</b> 
<b>Cross roller guide</b>  ▶ P.1-083 KXC ▶ P.1-093 KX ▶ P.1-101 KS101,102	<b>KX</b> 
	<b>KS101,KS102</b> 
<b>Slide guide</b>  ▶ P.1-121	<b>KXS</b> 
<b>Linear ball guide</b>  Gothic-arch Groove Gothic-arch Groove ▶ P.1-113	<b>KHE</b> 
	<b>KH</b> 
<b>Cross roller guide</b>  ▶ P.1-117	<b>KS332-8N,12</b> 





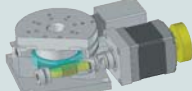




## Motorized Goniometer Stage Lineup

Goniometer Stage

Drive mechanism	Model
<b>Ball screw</b>  ▶ P.1-145	<b>KGB06</b> 
	<b>KGB07</b> 
<b>Worm gear</b>  ▶ P.1-149	<b>KGW</b> 
	<b>KG</b> 

## Motorized Rotary Stage Lineup

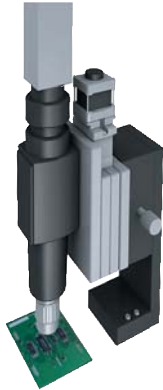
Rotary Stage

Drive mechanism	Model
<b>Ball screw</b>  ▶ P.1-169	<b>KRB</b> 
	<b>KRE04/06</b> 
	<b>KRE10360</b> 
<b>Worm gear</b>  ▶ P.1-177 KRE ▶ P.1-173 KRW ▶ P.1-181 KS402	<b>KRW</b> 
	<b>KS402-75,100</b> 
	<b>KS402-180</b> 
<b>Direct drive</b> ▶ P.1-189	<b>KS451</b> 

## Auto Focus

An angular bearing is built in the stage.  
It is useable in a stabilized state even the high-resolution-microscope.

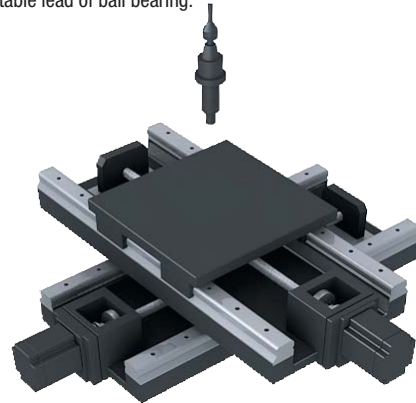
※Except for KXT series



■ Linear ball guide stage

## High-rigidity XY Stages

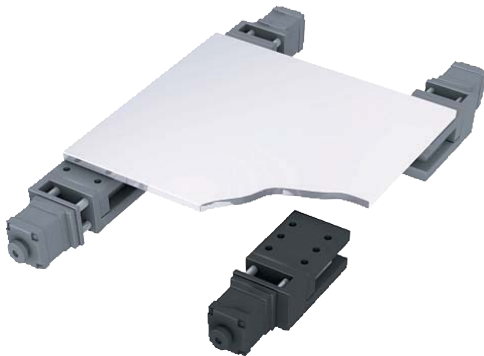
Load capacity 20kgf  
Selectable lead of ball bearing.



■ XY slide guide

## Liftable Panel and Plate

Available horizontal alignment with the horizontal Z stage.



■ Horizontal Z cross-roller guide

## Image Alignment (Rotation stage)

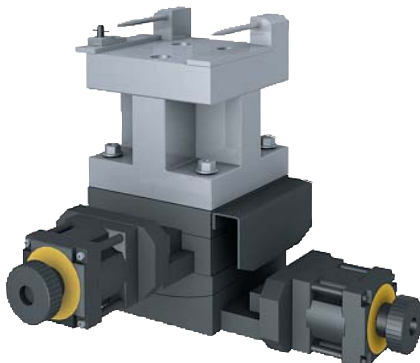
Can be used to interface with the image processing unit.  
Sine motion stages that integrated a ball bearing drive are designed with durability.



■ Sine motion rotation stage

## Angular Alignment of Optical Parts (Goniometer stage)

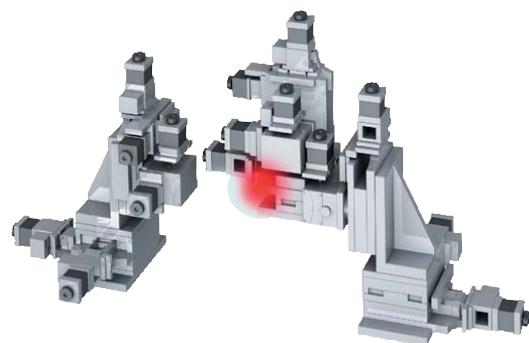
Fine angle adjustment of device for optical pick-up.  
(It has excellent durability)



■ Sinemotion Goniometer stage

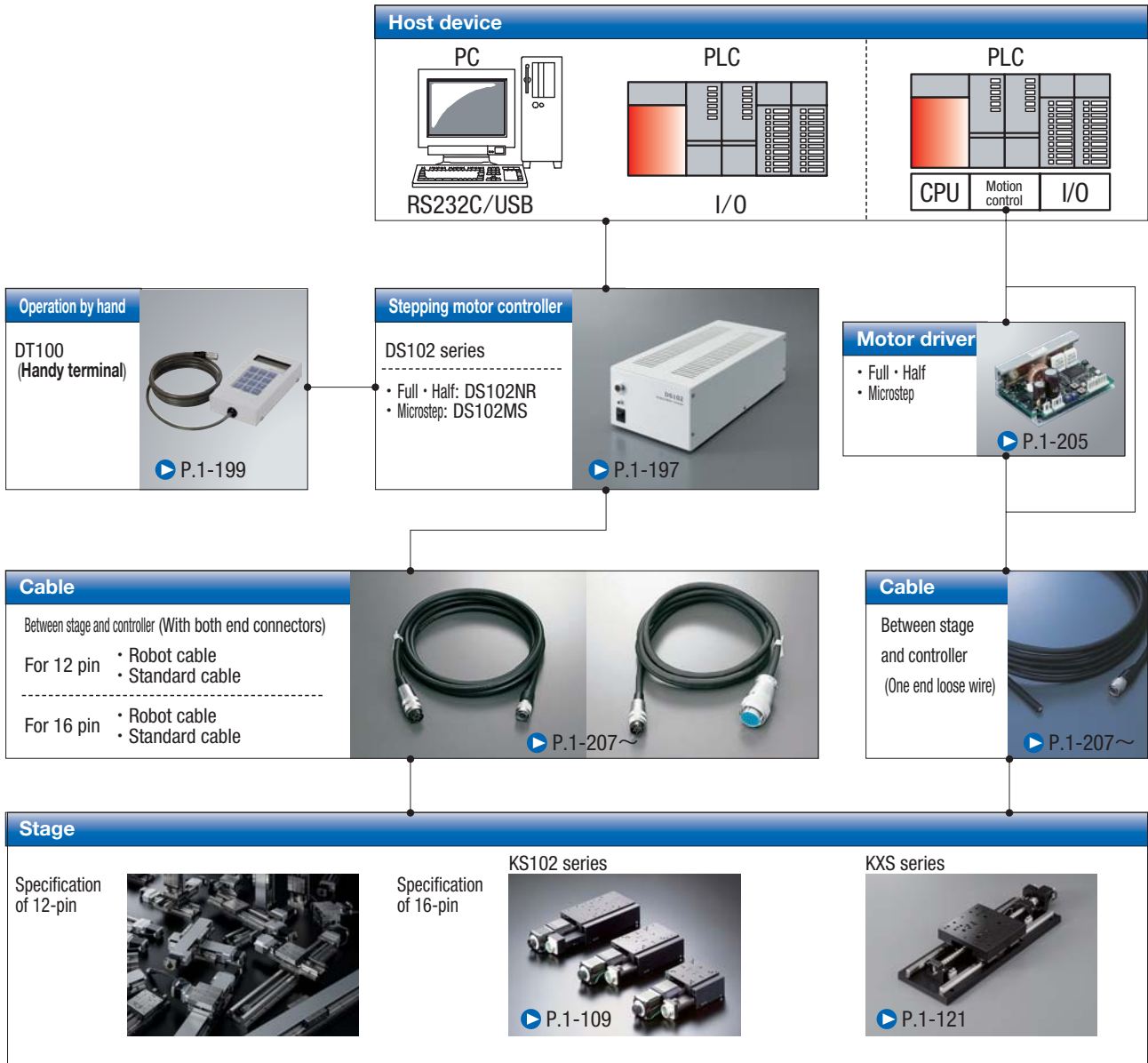
## 6-axis Stage Unit

It is ideal for alignment of LCD and digital camera image sensor.  
Please contact us if you need more information for configurations.

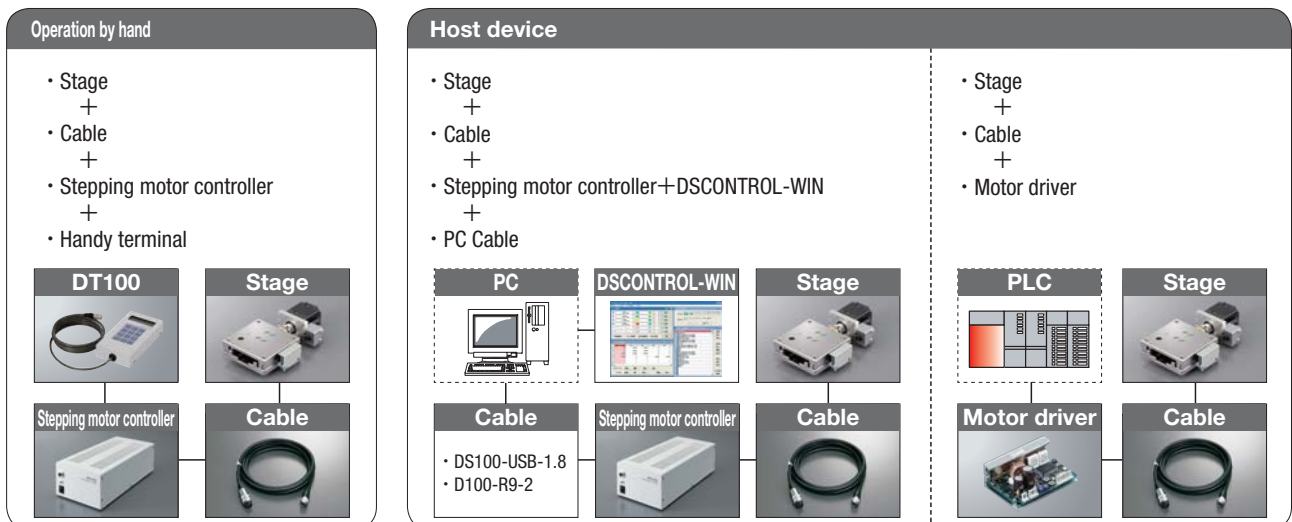


■ Stage unit (including special order)

## Connection Example



## Configurations



# Controller

## Stepping motor controller See page P.1-197 for specification details



SPEC				
Model	DS102□□	DS102□□-IO	DS112□□	DS112□□-IO
Driver type	DS102NR: Full/Half switching DS102MS: Microstep (16 steps)		DS112NR: Full/Half switching DS112MS: Microstep (16 steps)	
Universal input and output	Without	With	Without	With
Maximum power consumption	70W		DC24V Less than 2.5A	
Weight	2.2kg		1.2kg	

## Handy terminal: DT100 See page P.1-199 for specification details



DT100 handy terminal feature allows remotely operation a stepping motor controller DS102/DS112 on the board and rack.

Available to use for continuous operation, step operation, zero return and program execution in hand. Displays 16 digits and 2 rows on the LCD.

### Basic Specifications

Operating condition: 0~40°C、20~80%RH(drainless)  
 Storage condition: -20~60°C、20~80%RH(drainless)  
 Power input : DC24V (Supplied from controller)

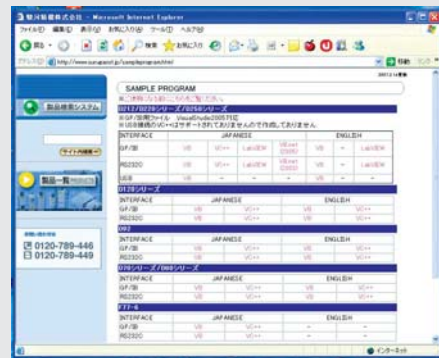
SPEC	
Model	DT100
Weight	300g

### Stage controller sample program

Must be needed to make a program if control DS102 series from your PC.  
 Please download our free sample program from our HP.

<http://eng.surugaseiki.com/>

Attention: You might not be follow this sample program.  
 You need to program finally.



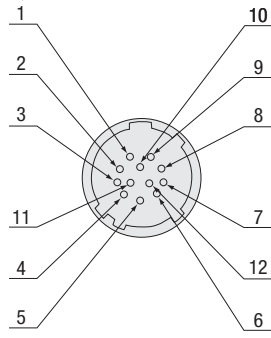
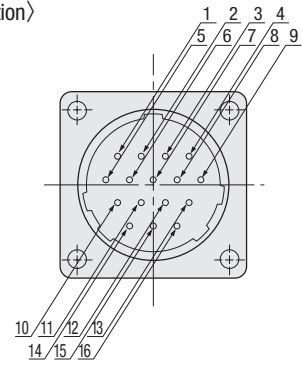
P.1-200

Sample display

## Electrical Specification

### Connector Specifications

Being used on the 2 kinds of connector for our stages as follows. ※For more information, see the electrical specification of each model.

Connector type	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)	SRCN2A21-16P (JAE)																																																								
Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	SRCN6A21-16S (JAE)																																																								
Pin counts	12	16																																																								
Pin allocation	<p>〈Pin allocation〉</p> 	<p>〈Pin allocation〉</p> 																																																								
Pin assignment	<p>〈Pin assignment〉</p> <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td>1</td><td>Motor lead</td></tr> <tr><td>2</td><td>Motor lead</td></tr> <tr><td>3</td><td>Motor lead</td></tr> <tr><td>4</td><td>Motor lead</td></tr> <tr><td>5</td><td>Motor lead</td></tr> <tr><td>6</td><td>CWLS output</td></tr> <tr><td>7</td><td>CCWLS output</td></tr> <tr><td>8</td><td>ORG2</td></tr> <tr><td>9</td><td>Power input (+)</td></tr> <tr><td>10</td><td>ORG1</td></tr> <tr><td>11</td><td>Power input (-)</td></tr> <tr><td>12</td><td>F.G</td></tr> </table> <p>※May not function properly when you use DS series.</p>	1	Motor lead	2	Motor lead	3	Motor lead	4	Motor lead	5	Motor lead	6	CWLS output	7	CCWLS output	8	ORG2	9	Power input (+)	10	ORG1	11	Power input (-)	12	F.G	<p>〈Pin assignment〉</p> <table border="1" style="display: inline-table; margin-right: 20px;"> <tr><td>1</td><td>Motor lead</td></tr> <tr><td>2</td><td>Motor lead</td></tr> <tr><td>3</td><td>Motor lead</td></tr> <tr><td>4</td><td>Motor lead</td></tr> <tr><td>5</td><td>Motor lead</td></tr> <tr><td>6</td><td>CWLS output</td></tr> <tr><td>7</td><td>Open</td></tr> <tr><td>8</td><td>CCWLS output</td></tr> <tr><td>9</td><td>Open</td></tr> <tr><td>10</td><td>Power input (+)</td></tr> <tr><td>11</td><td>NORG出力</td></tr> <tr><td>12</td><td>Electromagnetic brake (+)</td></tr> <tr><td>13</td><td>Electromagnetic brake (-)</td></tr> <tr><td>14</td><td>ORG output</td></tr> <tr><td>15</td><td>Power input (-)</td></tr> <tr><td>16</td><td>F.G</td></tr> </table> <p>※May not function properly when you use the electromagnetic brake(+,-).</p>	1	Motor lead	2	Motor lead	3	Motor lead	4	Motor lead	5	Motor lead	6	CWLS output	7	Open	8	CCWLS output	9	Open	10	Power input (+)	11	NORG出力	12	Electromagnetic brake (+)	13	Electromagnetic brake (-)	14	ORG output	15	Power input (-)	16	F.G
1	Motor lead																																																									
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1	Motor lead																																																									
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14	ORG output																																																									
15	Power input (-)																																																									
16	F.G																																																									
Stages	KXG06 series PG series KS101 series KH series KRB series KGW series KRW series	KXL06 series KXC04/06 series KX series KS332 series KS4□□ series KG series KXT/KHE/KRE series	KS102 series KXS18 series																																																							

### List of cables

Specification	Stage-side connector	Cable type	Cable option code																
			Linear								Horizontal Z		goniometer		Rotary				
			PG	KXL	KXS	KXG	KXC	KS101	KS102	KX07/08 KX10/12	KXT	KH KS332	KHE	KGB KGW	KG05 KG07	KRB KRW	KS402 KS451	KRE	
2m	12 pin	D214-2-2E	Blank	A		A	A	Blank		Blank		Blank		A	Blank	A	Blank		
One end loose 2m		D214-2-2EK	1	B		B	B	1		1		1		B	1	B	1		
4m		D214-2-4E	2	C		C	C	2		2		2		C	2	C	2		
One end loose 4m		D214-2-4EK	3	D		D	D	3		3		3		D	3	D	3		
Only connector (Cable is not included)		—	4	E		E	E	4		4		4		E	4	E	4		
Without		—	5	Blank		Blank	Blank	5		5		5		Blank	5	Blank	5		
Robot cable 2m		D214-2-2R	6	F		F	F	6		6	F	F		F	6	F	6	F	
Robot cable 4m		D214-2-4R	7	H		H	H	7		7	H	H		H	7	H	7	H	
Robot cable 2m one end loose		D214-2-2RK	9	G		G	G	9		9	G	G		G	9	G	9	G	
Robot cable 4m one end loose		D214-2-4RK	8	J		J	J	8		8	J	J		J	8	J	8	J	
2m		16 pin	D214-1-2E			A				Blank									
One end loose 2m			D214-1-2EK			B				1									
4m	D214-1-4E				C				2										
One end loose 4m	D214-1-4EK				D				3										
Only connector (Cable is not included)	—				E				4										
Without	—				Blank				5										
Robot cable 2m	D214-1-2R				F				6										
Robot cable 4m	D214-1-4R				H				7										
Robot cable 2m one end loose	D214-1-2RK				G				9										
Robot cable 4m one end loose	D214-1-4RK				J				8										

■ In case of using ORG2

Cable for four sensors	12 pin	D214-2-*	○							○		○		○	○			
------------------------	--------	----------	---	--	--	--	--	--	--	---	--	---	--	---	---	--	--	--

Please select a "cable code:5(without cable)" for your order. Please order a cable for 4 sensors.

※ See page P.1-207 for 4 sensor cable.

※ only KH

# How to Check the Specification List

SPEC		
<b>Model</b>	<b>KS000-00</b>	
Mechanical specification	Travel length	00mm ----- ①
	Table size	00×00mm ----- ②
	Feed screw (Ball screw)	φ0 lead 0 ----- ③
	Guide	○○○○ ----- ④
	Main materials-Finishing	○○—○○ processing ----- ⑤
	Weight	0kg ----- ⑥
Accuracy specification	Resolution	Pulse ----- ⑦
	MAX speed	00mm/sec ----- ⑧
	Uni-directional positioning accuracy	Within 00μm ----- ⑨
	Repeatability positioning accuracy	Within ±00μm ----- ⑩
	Load capacity	0kgf [0N] ----- ⑪
	Moment stiffness	00"N · cm ----- ⑫
	Lost motion	Within 00μm ----- ⑬
	Backlash	Within 00μm ----- ⑭
	Straightness	Within 00μm ----- ⑮
	Parallelism	Within 00μm ----- ⑯
	Motion parallelism	Within 00μm ----- ⑰
Pitching/Yawing	Within 00"/Within 00" ----- ⑱	
Sensor	Limit sensor	Installed ----- ⑲
	Origin sensor	Installed ----- ⑲
	Slit origin sensor	----- ⑲
Provided screw (hexagon-headed bolt)	○ of M—○ ----- ⑳	

### ① Travel length

- Represent the distance of the stage surface from CW limit to CCW limit.
- Tracing diagram shows at the stroke center.

### ② Table size

- Shows size of stage table surface. Displays multiply width by length.

### ③ Feed screw (Ball screw)

- Shows size and lead of ball screw.

### ④ Guide

- Shows system of moving guide.

### ⑤ Main materials-Finishing

- Shows materials and surface finishing that is configured upper side of stage and housing.

### ⑥ Weight

- Shows mass of products. (not include cable weight)

### ⑦ Resolution

- Shows stage travel length for a signal per pulse. Basically spec shows resolution at the full-step. The division number of full-step, half-step and micro-step driver might be changed at the controller.

$$\text{Travel length per pulse (mm)} = \text{Ball bearing lead (mm)} \times \frac{\text{Motor step angle}}{360^\circ} \times \frac{1}{n}$$

※n is division number of micro-step.

n=1 is for full-step, n=2 is for half-step. Selectable micro-step from 1 · · · 250 division number 16 patterns. Stage only has Full/Half display can be divided with our driver for micro-step.

### ⑧ MAX speed

- Put maximum load, the speed that can be driven by full-step setting with our controller.

※Speed can be different based on the driver controller and the load.

### ⑨ Uni-directional positioning accuracy

- ▶ See the inspector instruction P.2-187~

### ⑩ Repeatability positioning accuracy

- ▶ See the inspector instruction

### ⑪ Load capacity

- Load capacity means it can be mounted on the center of the stage. Speed value shows drivable with maximum speed. Load capacity of Z stage shows 'Load capacity (at the excitation)'.

### ⑫ Moment stiffness

- ▶ See the inspector instruction P.2-187~

### ⑬ Lost motion

- ▶ See the inspector instruction P.2-187~

### ⑭ Backlash

- ▶ See the inspector instruction P.2-187~

### ⑮ Straightness

- ▶ See the inspector instruction P.2-187~

### ⑯ Parallelism

- ▶ See the inspector instruction P.2-187~

### ⑰ Motion parallelism

- ▶ See the inspector instruction P.2-187~

### ⑱ Pitching/yawing

- ▶ See the inspector instruction P.2-187~

### ⑲ Sensor

- Shows presence or absence of the equipment such as limit, origin and slit origin sensors.


### ⑳ Provided screw

- Shows size and numbers of the provided screws.

## Stage Selection Guide



### Motorized Stage [Travel length-20mm]

Mechanical specification	PG413	PG513	KXT04015	KXT06015	PG615
	 <small>The photo shows □PG615</small>	 <small>The photo shows □PG615</small>			
Travel length	13mm	13mm	15mm	15mm	15mm
Table size	40×40mm	50×50mm	40×40mm	60×60mm	60×60mm
Feed screw (Ball screw)	φ6 lead 1	φ6 lead 1	φ6 lead 1	φ6 lead 1	φ6 lead 1
Guide	Linear ball	Linear ball	Linear ball	Linear ball	Linear ball
Main materials	Stainless	Stainless	Steel	Steel	Stainless
Finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing
Full length	142.5mm	152.5mm	105.5mm	125.5mm	162.5mm
Full width	56.8mm	66.8mm	56mm	69.5mm	76.8mm
Stage thickness	20mm	20mm	20mm	20mm	20mm
Weight	0.50kg	0.60kg	0.38kg	0.60kg	0.70kg

Accuracy specification		PG413	PG513	KXT04015	KXT06015	PG615
Resolution	Full/Half	2μm/1μm	2μm/1μm	2μm/1μm	2μm/1μm	2μm/1μm
	Micro step (1/20 split)	0.1μm	0.1μm	—	—	0.1μm
MAX speed		10mm/sec	10mm/sec	10mm/sec	10mm/sec	10mm/sec
Uni-directional positioning accuracy		Within 6μm	Within 6μm	Within 10μm	Within 10μm	Within 6μm
Repeatability positioning accuracy		Within ±0.5μm	Within ±0.5μm	Within ±1μm	Within ±1μm	±0.5μm
Load capacity		10kgf [98N]	10kgf [98N]	10kgf [98N]	10kgf [98N]	10kgf [98N]
Moment stiffness	Pitch	0.22°/N · cm	0.14°/N · cm	0.38°/N · cm	0.10°/N · cm	0.08°/N · cm
	Yaw	0.17°/N · cm	0.10°/N · cm	0.35°/N · cm	0.08°/N · cm	0.07°/N · cm
	Roll	0.12°/N · cm	0.06°/N · cm	0.21°/N · cm	0.05°/N · cm	0.03°/N · cm
Lost motion		Within 1.0μm	Within 1.0μm	Within 2.5μm	Within 2.5μm	Within 1.0μm
Backlash		Within 0.5μm	Within 0.5μm	—	—	Within 0.5μm
Straightness		Within 1.0μm	Within 1.0μm	Within 10μm	Within 10μm	Within 1.0μm
Parallelism		Within 15μm	Within 15μm	Within 20μm	Within 20μm	Within 15μm
Motion parallelism		Within 5μm	Within 5μm	—	—	Within 5μm
Pitching		Within 15°	Within 15°	Within 30°	Within 35°	Within 15°
Yawing		Within 10°	Within 10°	Within 25°	Within 30°	Within 10°
Cable type		D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□
Sensor	Limit sensor	Installed	Installed	Installed	Installed	Installed
	Origin sensor	Installed	Installed	Installed	Installed	Installed
	Slit (proximity) origin sensor	Installed	Installed	—	—	Installed

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option	PG413	PG513	KXT04015	KXT06015	PG615	
Opposite hand	○	○	—	—	○	
Sensor voltage	DC5V/24V Selectable	DC5V/24V Selectable	DC5~24V	DC5~24V	DC5V/24V Selectable	
Sensor logic	Limit sensor	Selectable	Selectable	N.C.	N.C.	Selectable
	Origin sensor	Selectable	Selectable	N.C.	N.C.	Selectable
	Slit origin sensor	Selectable	Selectable	—	—	Selectable
Motor	High-torque	○	○	—	—	○
	High resolution	○	○	—	—	○
	With brake	○	○	—	—	○
	α step	○	○	—	—	○
AC servo	○	○	—	—	○	
Clean grease standard(except bearing part)	—	—	—	—	—	
Page	▶ P.1-021	▶ P.1-021	▶ P.1-017	▶ P.1-017	▶ P.1-021	

※ [—] is uncovered the guarantee and no standard.





## Motorized Stage [Travel length=20mm]

Mechanical specification	KXC04015	PG715	KXG06020	KXC06020
				
Travel length	15mm	15mm	20mm	20mm
Table size	40×40mm	70×70mm	60×60mm	60×60mm
Feed screw (Ball screw)	φ6 lead 1	φ6 lead 1	φ8 lead 1	φ8 lead 1
Guide	Crossed roller	Linear ball	Linear ball	Crossed roller
Main materials	Aluminum	Stainless	Stainless	Aluminum
Finishing	Black almite finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Black almite finishing
Full length	102.5mm	172.5mm	116mm	114mm
Full width	40mm	86.8mm	60mm	60mm
Stage thickness	30mm	20mm	30mm	30mm
Weight	0.31kg	0.90kg	0.78kg	0.44kg

Accuracy specification		KXC04015	PG715	KXG06020	KXC06020
Resolution	Full/Half	2μm/1μm	2μm/1μm	2μm/1μm	2μm/1μm
	Micro step (1/20 split)	0.1μm	0.1μm	0.1μm	0.1μm
MAX speed		10mm/sec	10mm/sec	20mm/sec	20mm/sec
Uni-directional positioning accuracy		Within 10μm	Within 6μm	Within 5μm	Within 5μm
Repeatability positioning accuracy		Within ±0.5μm	Within ±0.5μm	Within ±0.5μm	Within ±0.3μm
Load capacity		5kgf [49N]	10kgf [98N]	5kgf [49N]	5kgf [49N]
Moment stiffness	Pitch	0.33"/N · cm	0.03"/N · cm	0.08"/N · cm	0.15"/N · cm
	Yaw	0.44"/N · cm	0.03"/N · cm	0.05"/N · cm	0.12"/N · cm
	Roll	0.37"/N · cm	0.01"/N · cm	0.05"/N · cm	0.07"/N · cm
Lost motion		Within 1μm	Within 1μm	Within 1μm	Within 1μm
Backlash		Within 0.5μm	Within 0.5μm	Within 1.0μm	Within 0.5μm
Straightness		Within 3μm	Within 1μm	Within 3μm	Within 3μm
Parallelism		Within 30μm	Within 15μm	Within 15μm	Within 30μm
Motion parallelism		Within 10μm	Within 5μm	Within 10μm	Within 10μm
Pitching		Within 25"	Within 15"	Within 20"	Within 20"
Yawing		Within 20"	Within 10"	Within 15"	Within 15"
Cable type		D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□
Sensor	Limit sensor	Installed	Installed	Installed	Installed
	Origin sensor	Installed	Installed	Installed	Installed
	Slit (proximity) origin sensor	—	Installed	—	—

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option		KXC04015	PG715	KXG06020	KXC06020
Opposite hand		—	○	—	—
Sensor voltage		DC5~24V	DC5V/24V Selectable	DC5~24V	DC5~24V
Sensor logic	Limit sensor	N.C.	Selectable	N.C.	N.C.
	Origin sensor	N.C.	Selectable	N.C.	N.C.
	Slit origin sensor	—	Selectable	—	—
Motor	High-torque	—	○	○	○
	High resolution	—	○	○	○
	With brake	—	○	○	—
	α Step	○	○	○	○
AC servo	—	○	—	—	
Clean grease standard(except bearing part)		—	—	○	—
Page		▶ P.1-083	▶ P.1-021	▶ P.1-041	▶ P.1-083

※ [—] is uncovered the guarantee and no standard.

## Stage Selection Guide

Intensive comparison

### Motorized Stage [Travel length=30mm]

Mechanical specification	KX0725C	PG430	PG530	KXL06030	KXG06030
					
Travel length	25mm	30mm	30mm	30mm	30mm
Table size	70×70mm	40×60mm	50×70mm	60×60mm	60×70mm
Feed screw (Ball screw)	φ6 lead 1	φ6 lead 1	φ6 lead 1	φ8 lead 1 (2)	φ8 lead 1
Guide	Crossed roller	Linear ball	Linear ball	Linear ball	Linear ball
Main materials	Aluminum	Stainless	Stainless	Stainless	Stainless
Finishing	White almitite finish	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing
Weight ( ) With cover type	1.0kg	0.6kg	0.78kg	1.28 (1.34) kg	0.9kg
Full length ( ) With cover type	197mm	171mm	181mm	198 (203) mm	131mm
Full width	88.5mm	56.8mm	66.8mm	60mm	60mm
Stage thickness ( ) With cover type	21mm	20mm	20mm	30 (33) mm	30mm

Accuracy specification		KX0725C	PG430	PG530	KXL06030	KXG06030
Resolution ( ) means lead 2	Full/Half	1μm/0.5μm	2μm/1μm	2μm/1μm	2μm/1μm (4μm/2μm)	2μm/1μm
	Micro step (1/20 split)	0.05μm	0.1μm	0.1μm	0.1μm (0.2μm)	0.1μm
MAX speed ( ) means lead 2		10mm/sec	10mm/sec	10mm/sec	30mm/sec (35mm/sec)	20mm/sec
Uni-directional positioning accuracy		Within 5μm	Within 12μm	Within 12μm	Within 5μm	Within 5μm
Repeatability positioning accuracy		±0.3μm	±0.5μm	±0.5μm	±0.5μm	±0.5μm
Load capacity		10kg [98N]	10kg [98N]	10kg [98N]	12kg [117.6N]	5kg [49N]
Moment stiffness	Pitch	0.09°/N·cm	0.24°/N·cm	0.12°/N·cm	0.05°/N·cm	0.08°/N·cm
	Yaw	0.07°/N·cm	0.18°/N·cm	0.13°/N·cm	0.05°/N·cm	0.05°/N·cm
	Roll	0.07°/N·cm	0.26°/N·cm	0.1°/N·cm	0.05°/N·cm	0.05°/N·cm
Lost motion		Within 1μm	Within 1μm	Within 1μm	Within 1μm	Within 1μm
Backlash		Within 0.5μm	Within 0.5μm	Within 0.5μm	Within 1μm	Within 1μm
Straightness		Within 1μm	Within 2μm	Within 2μm	Within 3μm	Within 3μm
Parallelism		Within 30μm	Within 15μm	Within 15μm	Within 15μm	Within 15μm
Motion parallelism		Within 10μm	Within 10μm	Within 10μm	Within 10μm	Within 10μm
Pitching		Within 20"	Within 20"	Within 20"	Within 20"	Within 20"
Yawing		Within 15"	Within 15"	Within 15"	Within 15"	Within 15"
Cable type		D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□
Sensor	Limit sensor	Installed	Installed	Installed	Installed	Installed
	Origin sensor	Installed	Installed	Installed	Option	Installed
	Slit(proximity) origin sensor	Installed	Installed	Installed	—	—

※Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option	KX0725C	PG430	PG530	KXL06030	KXG06030	
Opposite hand	○	○	○	—	—	
Sensor voltage	DC5~24V	DC5V/24V Selectable	DC5V/24V Selectable	DC5~24V	DC5~24V	
Sensor logic	Limit sensor	N.C.	Selectable	Selectable	N.C.	N.C.
	Origin sensor	Switchable (Factory preset mode N.C.)	Selectable	Selectable	N.C.	N.C.
	Slit origin sensor	Switchable (Factory preset mode N.C.)	Selectable	Selectable	—	—
Motor	High-torque	—	○	○	○	○
	High resolution	Standard	○	○	○	○
	With brake	—	○	○	○	○
	α Step	—	○	○	○	○
AC servo	—	○	○	○	—	
Clean grease standard(except bearing part)	—	—	—	○	○	
Page	▶ P.1-093	▶ P.1-025	▶ P.1-025	▶ P.1-055	▶ P.1-041	

※ [—] means "no guarantee, not available as a standard".



## Motorized Stage [Travel length=30mm]

Mechanical specification	KS101-30	KX0830C	KS102-30
			
Travel length	30mm	30mm	30mm
Table size	60×70mm	80×80mm	80×80mm
Feed screw (Ball screw)	φ8 lead 1	φ8 lead 1	φ8 lead 1
Guide	Crossed roller	Crossed roller	Crossed roller
Main materials	Aluminum	Aluminum	Aluminum
Finishing	Black almite finishing	Black almite finishing	Black almite finishing
Weight	0.56kg	1.2kg	1.4kg
Full length	136mm	212mm	194.5mm
Full width	80.5mm	98.5mm	96mm
Stage thickness	30mm	26mm	46mm

Accuracy specification		KS101-30	KX0830C	KS102-30
Resolution	Full/Half	2μm/1μm	1μm/0.5μm	1μm/0.5μm
	Micro step (1/20 split)	0.05μm resolutin when select a microstep motor	0.05μm	0.05μm
MAX speed		20mm/sec	10mm/sec	10mm/sec
Uni-directional positioning accuracy		Within 5μm	Within 5μm	Within 5μm
Repeatability positioning accuracy		±0.3μm	±0.3μm	±0.3μm
Load capacity		5kg [49N]	15kg [147N]	20kg [196N]
Moment stiffness	Pitch	0.15"/N · cm	0.05"/N · cm	0.07"/N · cm
	Yaw	0.08"/N · cm	0.04"/N · cm	0.06"/N · cm
	Roll	0.07"/N · cm	0.03"/N · cm	0.02"/N · cm
Lost motion		Within 1μm	Within 1μm	Within 1μm
Backlash		Within 0.5μm	Within 0.5μm	Within 0.5μm
Straightness		Within 3μm	Within 1μm	—
Parallelism		Within 30μm	Within 30μm	Within 30μm
Motion parallelism		Within 10μm	Within 10μm	Within 10μm
Pitching		Within 25"	Within 20"	Within 25"
Yawing		Within 20"	Within 15"	Within 15"
Cable type		D214-2-□□	D214-2-□□	D214-1-□□
Sensor	Limit sensor	Installed	Installed	Installed
	Origin sensor	Installed	Installed	Installed
	Slit(proximity) origin sensor	—	Installed	Installed

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option		KS101-30	KX0830C	KS102-30
Opposite hand		○	○	○
Sensor voltage		DC5~24V	DC5~24V	DC5~24V
Sensor logic	Limit sensor	N.C.	N.C.	N.C.
	Origin sensor	N.C.	Switchable (Factory preset mode N.C.)	N.C.
	Slit origin sensor	—	Switchable (Factory preset mode N.C.)	N.C.
Motor	High-torque	—	—	—
	High resolution	○	Standard	Standard
	With brake	—	—	—
	α Step	○	—	○
AC servo		—	—	—
Clean grease as a standard(except bearing part)		—	—	—
Page		▶ P.1-101	▶ P.1-093	▶ P.1-109

※ [—] is uncovered the guarantee and no standard.

## Stage Selection Guide



### Motorized Stage [Travel length=50mm]

Mechanical specification	KX1040C	KXL06050	PG650	PG750	KX1250C
					
Travel length	40mm	50mm	50mm	50mm	50mm
Table size	100×100mm	60×60mm	60×100mm	70×110mm	120×120mm
Feed screw (Ball screw)	φ8 lead 1	φ8 lead 1 (2)	φ6 lead 1	φ6 lead 1	φ8 lead 1
Guide	Crossed roller	Linear ball	Linear ball	Linear ball	Crossed roller
Main materials	Aluminum	Stainless	Stainless	Stainless	Aluminum
Finishing	Black almite finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Black almite finishing
Weight ( ) With cover type	1.6kg	1.40 (1.44) kg	1.08kg	1.16kg	2.2kg
Full length ( ) With cover type	237mm	218 (223) mm	220mm	230mm	263mm
Full width	114.5mm	60mm	76.8mm	86.8mm	134.5mm
Stage thickness ( ) With cover type	30mm	30 (33) mm	20mm	20mm	35mm

Accuracy specification	KX1040C	KXL06050	PG650	PG750	KX1250C	
Resolution ( ) means lead 2	Full/Half	1μm/0.5μm	2μm/1μm (4μm/2μm)	2μm/1μm	2μm/1μm	1μm/0.5μm
	Micro step (1/20 split)	0.05μm	0.1 (0.2) μm	0.1μm	0.1μm	0.05μm
MAX speed ( ) means lead 2	10mm/sec	30mm (35mm) /sec	10mm/sec	10mm/sec	10mm/sec	
Uni-directional positioning accuracy	Within 5μm	Within 5μm	Within 12μm	Within 12μm	Within 5μm	
Repeatability positioning accuracy	±0.3μm	±0.5μm	±0.5μm	±0.5μm	±0.3μm	
Load capacity	20kg [196N]	12kg [117.6N]	10kg [98N]	10kg [98N]	25kg [245N]	
Moment stiffness	Pitch	0.04"/N · cm	0.05"/N · cm	0.05"/N · cm	0.03"/N · cm	0.03"/N · cm
	Yaw	0.04"/N · cm	0.05"/N · cm	0.05"/N · cm	0.03"/N · cm	0.02"/N · cm
	Roll	0.02"/N · cm	0.05"/N · cm	0.05"/N · cm	0.03"/N · cm	0.02"/N · cm
Lost motion	Within 1μm	Within 1μm	Within 1μm	Within 1μm	Within 1μm	
Backlash	Within 0.5μm	Within 1μm	Within 0.5μm	Within 0.5μm	Within 0.5μm	
Straightness	Within 1μm	Within 3μm	Within 2μm	Within 2μm	Within 1μm	
Parallelism	Within 30μm	Within 15μm	Within 15μm	Within 15μm	Within 30μm	
Motion parallelism	Within 15μm	Within 10μm	Within 10μm	Within 10μm	Within 15μm	
Pitching	Within 20"	Within 20"	Within 20"	Within 20"	Within 20"	
Yawing	Within 15"	Within 15"	Within 15"	Within 15"	Within 15"	
Cable type	D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□	D214-2-□□	
Sensor	Limit sensor	Installed	Installed	Installed	Installed	Installed
	Origin sensor	Installed	Option	Installed	Installed	Installed
	Slit(proximity) origin sensor	Installed	—	Installed	Installed	Installed


※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option	KX1040C	KXL06050	PG650	PG750	KX1250C	
Opposite hand	Installed	Installed	Installed	Installed	Installed	
Sensor voltage	DC5~24V	DC5~24V	DC5~24V	DC5~24V	DC5~24V	
Sensor logic	Limit sensor	N.C.	N.C.	Selectable	Selectable	N.C.
	Origin sensor	Switchable (Factory preset mode N.C.)	N.C.	Selectable	Selectable	Switchable (Factory preset mode N.C.)
	Slit origin sensor	Switchable (Factory preset mode N.C.)	—	Selectable	Selectable	Switchable (Factory preset mode N.C.)
Motor	High-torque	—	○	○	○	—
	High resolution	Standard	○	○	○	Standard
	With brake	—	○	○	○	—
	α Step	—	○	○	○	—
AC servo	—	○	○	○	—	
Clean grease standard(except bearing part)	—	○	—	—	—	
Page	🔗 P.1-093	🔗 P.1-055	🔗 P.1-025	🔗 P.1-025	🔗 P.1-093	

※ [—] is uncovered the guarantee and no standard.



## Motorized Stage [Travel length=100mm]

Mechanical specification	KXL06075	KS102-70	KXL06100	KS102-100	KXS18100
					
Travel length	70mm	70mm	100mm	100mm	100mm
Table size	60×60mm	80×130mm	60×60mm	80×160mm	180×180mm
Feed screw (Ball screw)	φ8 lead 1 (2)	φ8 lead 1	φ8 lead 2	φ8 lead 1	φ15 lead 5 (10)
Guide	Linear ball	Crossed roller	Linear ball	Crossed roller	Slide guide
Main materials	Stainless	Aluminum	Stainless	Aluminum	Aluminum
Finishing	Opposite side of the end face finishing	Black almite finishing	Opposite side of the end face finishing	Black almite finishing	Black almite finishing
Weight ( ) With cover type	1.54 (1.60) kg	1.8kg	1.80 (1.86) kg	2.1kg	8.32 (8.12) kg
Full length ( ) With cover type	243 (248) mm	244.5mm	287.5 (292.5) mm	274.5mm	401.5mm
Full width	60mm	96mm	60mm	96mm	180mm
Stage thickness ( ) With cover type	30 (33) mm	46mm	30 (33) mm	46mm	75mm

Accuracy specification		KXL06075	KS102-70	KXL06100	KS102-100	KXS18100
Resolution	Full/Half	Lead 1mm: 2μm/1μm Lead 2mm: 4μm/2μm	1μm/0.5μm	4μm/2μm	1μm/0.5μm	lead 5mm: 10μm/5μm lead 10mm: 20μm/10μm
	Micro step (1/20 split)	Lead 1mm: 0.1μm Lead 2mm: 0.2μm	0.05μm	0.2μm	0.05μm	lead 5mm: 0.5μm lead 10mm: 1μm
MAX speed		Lead 1mm: 30mm/sec Lead 2mm: 35mm/sec	10mm/sec	45mm/sec	10mm/sec	lead 5mm: 30mm/sec lead 10mm: 50mm/sec
Uni-directional positioning accuracy		Within 7μm	Within 5μm	Within 10μm	Within 10μm	Within 15μm
Repeatability positioning accuracy		±0.5μm	±0.3μm	±0.5μm	±0.3μm	Within ±1μm
Load capacity		12kg [117.6N]	20kg [196N]	12kg [117.6N]	20kg [196N]	30kgf [294N]
Moment stiffness	Pitch	0.05"/N · cm	0.01"/N · cm	0.05"/N · cm	0.005"/N · cm	0.005"/N · cm
	Yaw	0.05"/N · cm	0.014"/N · cm	0.05"/N · cm	0.011"/N · cm	0.008"/N · cm
	Roll	0.05"/N · cm	0.01"/N · cm	0.05"/N · cm	0.008"/N · cm	0.003"/N · cm
Lost motion		Within 1μm	Within 1μm	Within 1μm	Within 1μm	—
Backlash		Within 1μm	Within 0.5μm	Within 1μm	Within 0.5μm	Within 2μm
Straightness		Within 3μm	—	Within 5μm	—	Within 10μm
Parallelism		Within 15μm	Within 30μm	Within 15μm	Within 30μm	Within 50μm
Motion parallelism		Within 10μm	Within 15μm	Within 10μm	Within 15μm	Within 20μm
Pitching		Within 20"	Within 25"	Within 25"	Within 25"	Within 30"
Yawing		Within 15"	Within 20"	Within 20"	Within 20"	Within 20"
Cable type		D214-2-□	D214-1-□□	D214-2-□	D214-1-□□	D214-1-□□
Sensor	Limit sensor	Installed	Installed	Installed	Installed	Installed
	Origin sensor	Option	Installed	Option	Installed	Installed
	Slit(proximity) origin sensor	—	Installed	—	Installed	Installed

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option		KXL06075	KS102-70	KXL06100	KS102-100	KXS18100
Opposite hand		—	○	—	○	—
Sensor voltage		DC5~24V	DC5~24V	DC5~24V	DC5~24V	DC5~24V
Sensor logic	Limit sensor	N.C.	N.C.	N.C.	N.C.	N.C.
	Origin sensor	N.C.	N.C.	N.C.	N.C.	N.C.
	Slit origin sensor	—	N.C.	—	N.C.	N.C.
Motor	High-torque	○	—	Standard	—	Standard
	High resolution	○	Standard	○	Standard	—
	With brake	○	—	○	—	○
	α Step	○	○	○	○	○
AC servo		○	—	○	—	○
Clean grease standard(except bearing part)		○	—	○	—	○
Page		▶ P.1-055	▶ P.1-109	▶ P.1-059	▶ P.1-109	▶ P.1-123

※ [—] is uncovered the guarantee and no standard.

## Stage Selection Guide



### Motorized Stage [Travel length-500mm]

Mechanical specification	KXL06150	KXL06200	KXS18200	KXL06300
				
Travel length	150mm	200mm	200mm	300mm
Table size	60×60mm	60×60mm	180×180mm	60×60mm
Feed screw (Ball screw)	φ8 lead 2	φ8 lead 2	φ15 lead 5 (10)	φ8 lead 2
Guide	Linear ball	Linear ball	Slide guide	Linear ball
Main materials	Stainless	Stainless	Aluminum	Stainless
Finishing	Opposite side of the end face finishing	Opposite side of the end face finishing	Black almite finishing	Opposite side of the end face finishing
Weight ( ) With cover type	2.10 (2.16) kg	2.42 (2.48) kg	9.48 (9.37) kg	3.02 (3.12) kg
Full length ( ) With cover type	337.5 (342.5) mm	387.5 (392.5) mm	501.5mm	487.5 (492.5) mm
Full width	60mm	60mm	180mm	60mm
Stage thickness ( ) With cover type	30 (33) mm	30 (33) mm	75mm	30 (33) mm

Accuracy specification		KXL06150	KXL06200	KXS18200	KXL06300
Resolution	Full/Half	4μm/2μm	4μm/2μm	lead 5mm: 10μm/5μm lead 10mm: 20μm/10μm	4μm/2μm
	Micro step (1/20 split)	0.2μm	0.2μm	0.5 (1) μm	0.2μm
MAX speed		45mm/sec	45mm/sec	30mm (50mm) /sec	45mm/sec
Uni-directional positioning accuracy		Within 15μm	Within 15μm	Within 20μm	Within 20μm
Repeatability positioning accuracy		±0.5μm	±0.5μm	±1μm	±0.5μm
Load capacity		12kg [117.6N]	12kg [117.6N]	30kg [294N]	12kg [117.6N]
Moment stiffness	Pitch	0.05"/N · cm	0.05"/N · cm	0.005"/N · cm	0.05"/N · cm
	Yaw	0.05"/N · cm	0.05"/N · cm	0.008"/N · cm	0.05"/N · cm
	Roll	0.05"/N · cm	0.05"/N · cm	0.003"/N · cm	0.05"/N · cm
Lost motion		Within 1μm	Within 1μm	—	Within 1μm
Backlash		Within 1μm	Within 1μm	Within 2μm	Within 1μm
Straightness		Within 5μm	Within 7μm	Within 15μm	Within 7μm
Parallelism		Within 15μm	Within 15μm	Within 50μm	Within 15μm
Motion parallelism		Within 15μm	Within 20μm	Within 20μm	Within 25μm
Pitching		Within 25"	Within 30"	Within 50"	Within 35"
Yawing		Within 20"	Within 20"	Within 20"	Within 20"
Cable type		D214-2-□	D214-2-□	D214-1-□	D214-2-□
Sensor	Limit sensor	Installed	Installed	Installed	Installed
	Origin sensor	Option	Option	Installed	Option
	Slit(proximity) origin sensor	—	—	Installed	—

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option		KXL06150	KXL06200	KXS18200	KXL06300
Opposite hand		—	—	—	—
Sensor voltage		DC5~24V	DC5~24V	DC5~24V	DC5~24V
Sensor logic	Limit sensor	N.C.	N.C.	N.C.	N.C.
	Origin sensor	N.C.	N.C.	N.C.	N.C.
	Slit origin sensor	—	—	—	—
Motor	High-torque	Standard	Standard	Standard	Standard
	High resolution	○	○	—	○
	With brake	○	○	○	○
	α step	○	○	○	○
AC servo		○	○	○	○
Clean grease standard(except bearing part)		○	○	○	○
Page		▶ P.1-059	▶ P.1-063	▶ P.1-123	▶ P.1-063

※ [—] is uncovered the guarantee and no standard.

Intensive comparison

## Motorized Stage [Travel length-500mm]

Mechanical specification	KXS18300	KXS18400	KXS18500
			
Travel length	300mm	400mm	500mm
Table size	180×180mm	180×180mm	180×180mm
Feed screw (Ball screw)	φ15 lead 5 (10)	φ15 lead 5 (10)	φ15 lead 5 (10)
Guide	Slide guide	Slide guide	Slide guide
Main materials	Aluminum	Aluminum	Aluminum
Finishing	Black almite finishing	Black almite finishing	Black almite finishing
Weight ( ) With cover type	10.72 (10.70) kg	11.92 (11.99) kg	13.10 (13.26) kg
Full length	601.5mm	701.5mm	801.5mm
Full width	180mm	180mm	180mm
Stage thickness	75mm	75mm	75mm

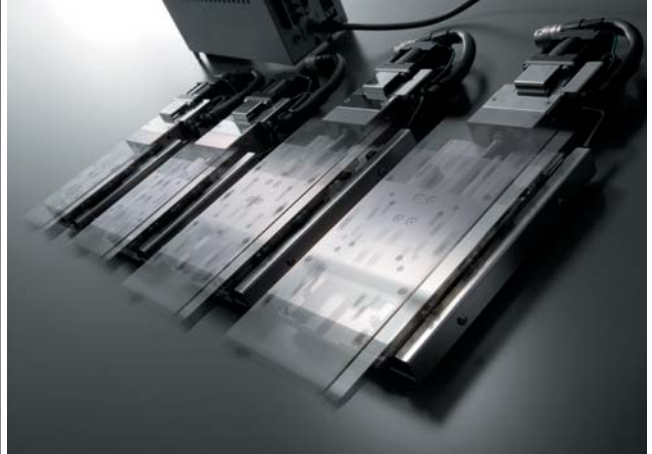
Accuracy specification		KXS18300	KXS18400	KXS18500
Resolution	Full/Half	lead 5mm: 10μm/5μm lead 10mm: 20μm/10μm	lead 5mm: 10μm/5μm lead 10mm: 20μm/10μm	lead 5mm: 10μm/5μm lead 10mm: 20μm/10μm
	Micro step (1/20 split)	0.5μm (1μm)	0.5μm (1μm)	0.5μm (1μm)
MAX speed		30mm/sec (50mm/sec)	30mm/sec (50mm/sec)	30mm/sec (50mm/sec)
Uni-directional positioning accuracy		Within 30μm	Within 35μm	Within 40μm
Repeatability positioning accuracy		±1μm	±1μm	±1μm
Load capacity		30kg [294N]	30kg [294N]	30kg [294N]
Moment stiffness	Pitch	0.005"/N · cm	0.005"/N · cm	0.005"/N · cm
	Yaw	0.008"/N · cm	0.008"/N · cm	0.008"/N · cm
	Roll	0.003"/N · cm	0.003"/N · cm	0.003"/N · cm
Lost motion		—	—	—
Backlash		Within 2μm	Within 2μm	Within 2μm
Straightness		Within 20μm	Within 25μm	Within 30μm
Parallelism		Within 50μm	Within 50μm	Within 50μm
Motion parallelism		Within 30μm	Within 30μm	Within 30μm
Pitching		Within 60"	Within 60"	Within 70"
Yawing		Within 30"	Within 30"	Within 30"
Cable type		D214-1-□	D214-1-□	D214-1-□
Sensor	Limit sensor	Installed	Installed	Installed
	Origin sensor	Installed	Installed	Installed
	Slit (proximity) origin sensor	Installed	Installed	Installed

※ Cable model for standard motor. Cable model may be changed when you select other motor type. Please refer detailed production page.

Option		KXS18300	KXS18400	KXS18500
Opposite hand		—	—	—
Sensor voltage		DC5~24V	DC5~24V	DC5~24V
Sensor logic	Limit sensor	N.C.	N.C.	N.C.
	Origin sensor	N.C.	N.C.	N.C.
	Slit origin sensor	N.C.	N.C.	N.C.
Motor	High-torque	Standard	Standard	Standard
	High resolution	—	—	—
	With brake	○	○	○
	α step	○	○	○
Clean grease standard(except bearing part)		○	○	○
Page		▶ P.1-123	▶ P.1-127	▶ P.1-127

※ [—] is uncovered the guarantee and no standard.

**Integrated upper-lower plate and guide.**  
**Realized "High rigidity, High precision, Low price"**



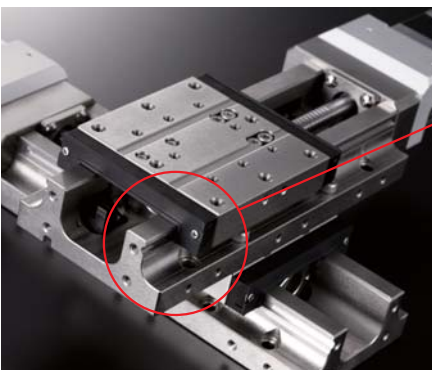
**High rigidity** Minimal fastener component. Realized high rigidity because it made from stainless.

\*KXT is made by steel.

**High precision** Travel accuracy and parallelism of upper-lower plate is performed highly because a guide is processed on a chassis directly.

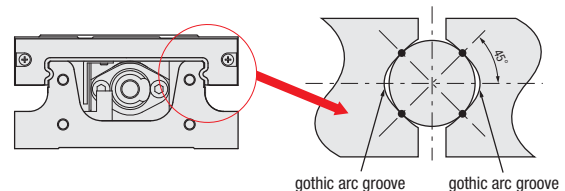
**Low price** Realized significant cost saving by an original production system.

### Linear ball guide configuration



#### ● High rigidity

The gothic arc groove ball guide is processed directly on a main body upper-lower plate. Gothic ark groove is made by 2 arcs, so it contact 2 points for one side. Realized high rigidity with 4 points contacting configuration, such as the figures below.





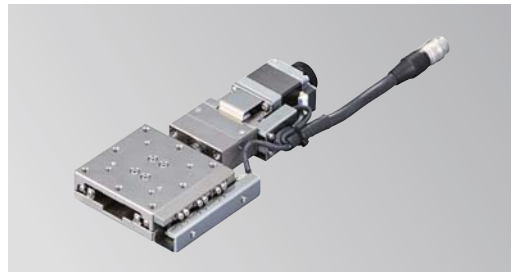
## High performance

### ■ KXT series



Specialized necessary functions. Outstanding cost performance.

### ■ PG series



Thin type with integration guide.  
Available wide range variation such as table-size and sensor options.

### ■ CAVE-X POSITIONER KXG series



Much compact than former linear ball guide and cross-roller guide stages.

### ■ CAVE-X POSITIONER KXL series



Selectable travel range between 30mm to 300mm.

## For proper operation

### ▽ Mounting

Fix at least 4 corners with attached screws.

### ▽ About the object that is mounted upper or lower the stage.

When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.

### ▽ Positioning

#### ■ Positioning of stage mounting

All products SPEC shows must be shown flat setting condition. Pay attention to mount such as up side down, vertical on the side and horizontal on the side. Load capacity and accuracy might be changed by the positioning. Please feel free to ask us for more information.

# Motorized Stage

## X-axis Linear Ball Guide: KXT04015/KXT06015

Motorized Stage

KXT04015-L

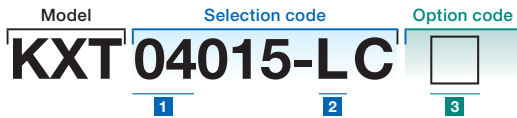


KXT06015-L



RoHS

\* This photos shows a cover position is an image in case of L.  
The holes and the shape may differ in certain respects from the actual product.

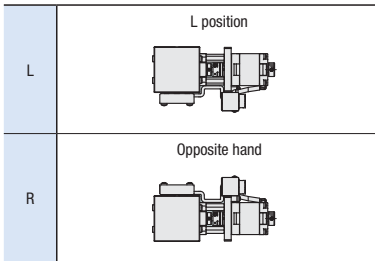


▶ Cable P.1-207~  
▶ Electrical specification P.1-019~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

### 2 Sensor cover location



### 3 Cable option

Code	Specification	Cable type
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* The one end loose side might be on an opposite side of stage.  
See page ▶ P.1-207,209~ for cable details.  
Please select "Code F or H" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

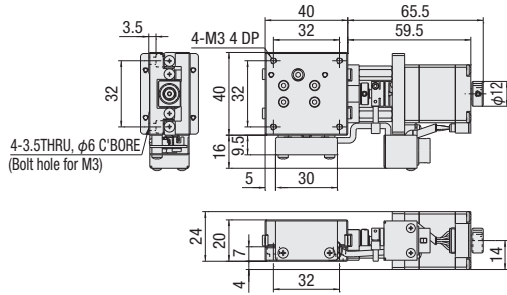
Other

### SPEC

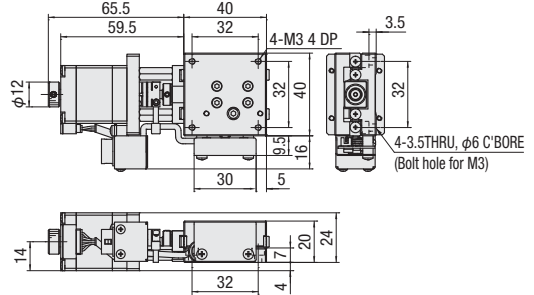
Model	KXT04015-LC	KXT06015-LC
(Right or left handed/opposite hand)	KXT04015-RC	KXT06015-RC
Travel length	15mm	
Table size	40×40mm	60×60mm
Feed screw (Ball screw)	φ6 lead 1	
Guide	Linear ball guide	
Main materials-Finishing	Steel—Opposite side of the end face finishing	
Weight	0.38kg	0.60kg
Resolution (Pulse)	2μm (Full)/1μm (Half)	
MAX speed	10mm/sec	
Uni-directional positioning accuracy	Within 10μm	
Repeatability positioning accuracy	±1μm	
Load capacity	10kgf [98N]	
Moment stiffness	Pitch 0.38/yaw 0.35/roll 0.21 ["/N · cm]	Pitch 0.1/yaw 0.08/roll 0.05 ["/N · cm]
Lost motion	Within 2.5μm	
Straightness	Within 10μm	
Parallelism	Within 20μm	
Pitching/Yawing	Within 30"/Within 25"	Within 35"/Within 30"
Limit sensor	Installed	
Origin sensor	Installed	
Provided screw (Hexagon-headed bolt)	4 of M3—8	

Dimensional outline drawings

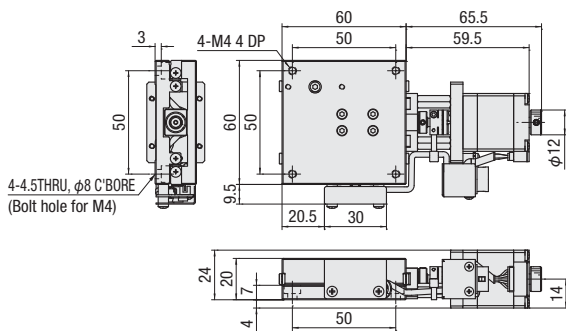
KXT04015-L



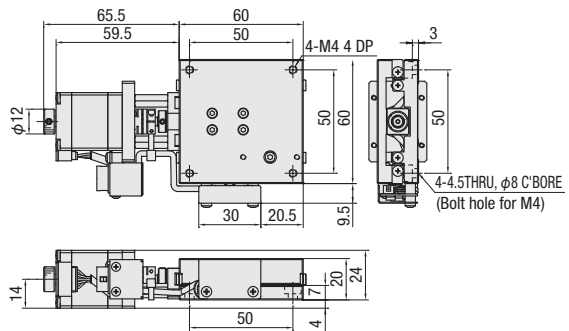
KXT04015-R



KXT06015-L



KXT06015-R



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

018

# Motorized Stage

## Electrical Specification: KXT04015/KXT06015

Motorized Stage

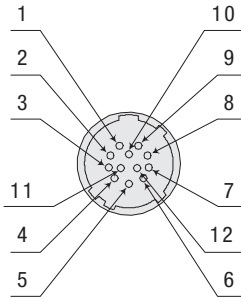
### Electrical specification

Models		KXT04015	KXT06015
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase	
	Maker	Oriental Motor Co.,Ltd.	
	Model (*2)	C005C-90215P	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12PC (71) (Hirose Electric Co.,Ltd.)	
	Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Model	Photo microsensor EE-SX4134 (Omuron Co.,Ltd.)	
	Power voltage	DC5~24V ±10%	
	Consumption current	Total 60mA or less	
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA	
Output logic		On detection (light shield condition): Output transistor OFF (Non-continuity)	

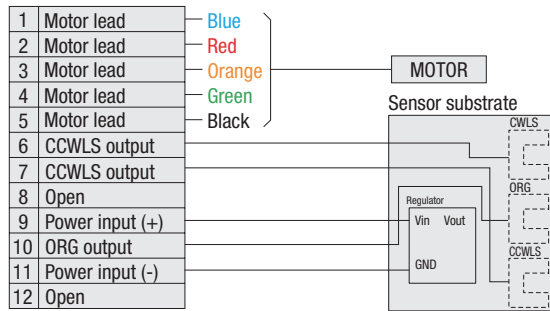
\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

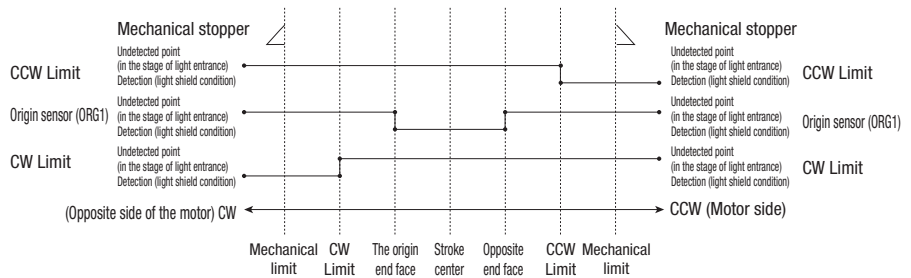
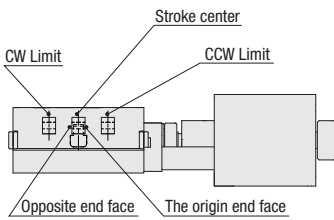
### Pin allocation



### Connection diagram



### Timing chart



Unit [mm]	Direction of CW	Direction of CCW							
		Reference coordinate	Mechanical limit	CW Limit	The origin end face	Stroke center	Opposite end face	CCW Limit	Mechanical limit
KXT	Return to origin		7	6.2	0	1.5	3	9.2	10
	Stroke center		8.5	7.7	1.5	0	1.5	7.7	8.5

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.

Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

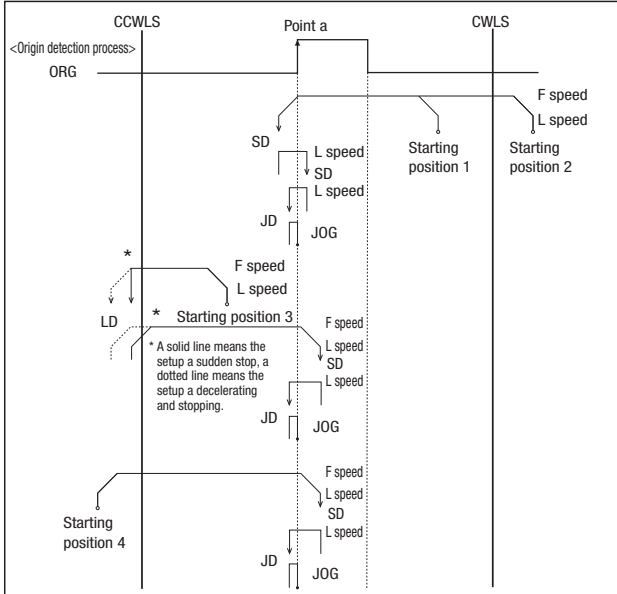
φ120

Other

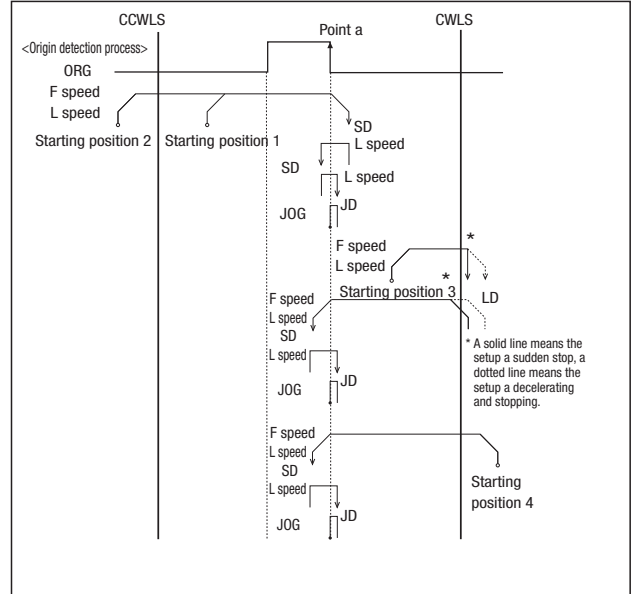
**KXT series recommendation return to origin method**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be working correctly. Set to the way of recommendation return origin when using our controller.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Type9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type10]** After finished Type4, perform detected process for CW edge of TIMING signal.

**Return to origin sequence** ▶ P.1-201~

**Adaptive driver**

■ **Driver** ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

■ **Controller** ▶ P.1-197~

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

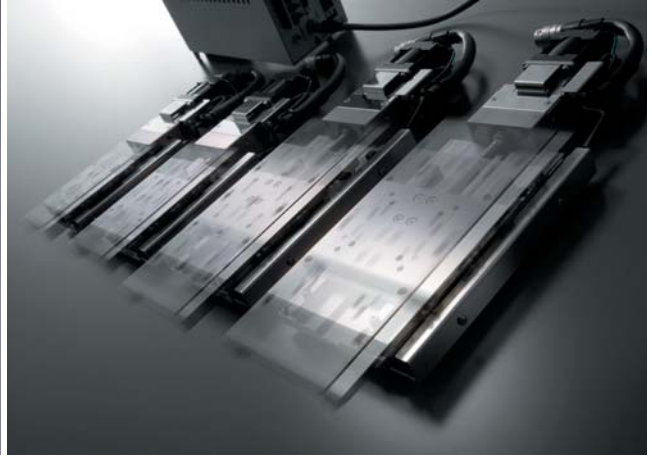
φ80

φ100

φ120

Other

**Integrated upper-lower plate and guide.**  
**Realized "High rigidity, High precision, Low price"**



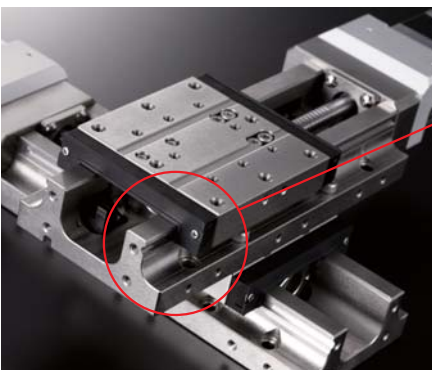
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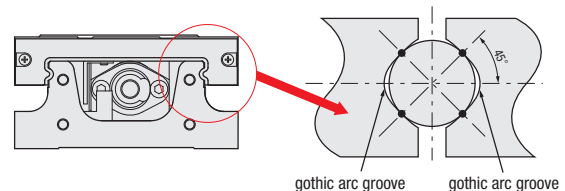
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### Linear ball guide configuration



#### ● High rigidity

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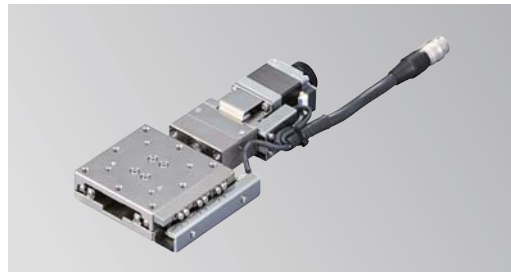
## High performance

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### ■ PG series



Thin type with integration guide.  
Available wide range variation such as table-size and sensor options.

### ■ CAVE-X POSITIONER KXG series



Much compact than former linear ball guide and cross-roller guide stages.

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Selectable travel range between 30mm to 300mm.

## For proper operation

### ▽ Mounting

Fix at least 4 corners with attached screws.

### ▽ About the object that is mounted upper or lower the stage.

When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.

### ▽ Positioning

#### ■ Positioning of stage mounting

All products SPEC shows must be shown flat setting condition. Pay attention to mount such as up side down, vertical on the side and horizontal on the side. Load capacity and accuracy might be changed by the positioning. Please feel free to ask us for more information.

## X-axis Linear Ball Guide: PG413/PG513/PG615/PG715

Motorized Stage

PG615-L



PG615-R



RoHS

Model Selection code Option code  
**PG 413-L05AG-C 5**

1 2 3 4 5 6 7

🔗 Cable P.1-207~  
 ⚡ Electrical specification P.1-037~

### 1 Table size

4	<input type="checkbox"/> 40mm
5	<input type="checkbox"/> 50mm
6	<input type="checkbox"/> 60mm
7	<input type="checkbox"/> 70mm

\* Cannot choose 415, 515, 613, 713 in combination with 1 and 2.

### 2 Travel length

13	13mm
15	15mm

### 4 Sensor voltage

05	5V
24	24V

\* 05 [5V] for standard

### 5 Sensor logic

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

\* The sensor voltage/logic is different, but the external form dimension is the same.

\* If you choose 24V, not available our controller DS102/112.

### 7 Cable option

※ See page P.1-039~ for ORG2 compatible cable.

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	
U	Cable for servo motor	

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

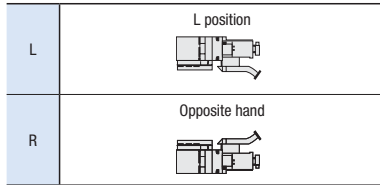
See page P.1-207,209~ for details of cable.

Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.

Motor/cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
	MA	M
	PA	P
U	U	

### 3 Sensor cover location



### 6 Motor option

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.

\* See page P.1-037~ for details of motor option.

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

SPEC					
Model	PG413-L05AG-C5	PG513-L05AG-C5	PG615-L05AG-C5	PG715-L05AG-C5	
(Opposite hand)	PG413-R05AG-C5	PG513-R05AG-C5	PG615-R05AG-C5	PG715-R05AG-C5	
Mechanical specification	Travel length	13mm		15mm	
	Table size	40×40mm	50×50mm	60×60mm	
	Feed screw (Ball screw)	φ6 lead 1			
	Guide	Linear ball guide			
	Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	0.5kg	0.6kg	0.7kg	0.9kg	
Accuracy specification	Resolution (Pulse)	2μm (Full)/1μm (Half)			
	MAX speed	10mm/sec			
	Uni-directional positioning accuracy	Within 6μm			
	Repeatability positioning accuracy	Within ±0.5μm			
	Load capacity	10kgf [98N]			
	Moment stiffness	Pitch 0.22/yaw 0.17/roll 0.12 ["/N · cm]	Pitch 0.14/yaw 0.10/roll 0.06 ["/N · cm]	Pitch 0.08/yaw 0.07/roll 0.03 ["/N · cm]	Pitch 0.03/yaw 0.03/roll 0.01 ["/N · cm]
	Lost motion	Within 1μm			
	Backlash	Within 0.5μm			
	Straightness	Within 1μm			
	Parallelism	Within 15μm			
Sensor	Motion parallelism	Within 5μm			
	Pitching/Yawing	Within 15"/Within 10"			
	Limit sensor	Installed			
	Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed See page P.1-039~				
Provided screw (Hexagon-headed bolt)	4 of M3—8		4 of M4—8		

※ Might be changed specification due to motors. See page P.1-213~ for details.

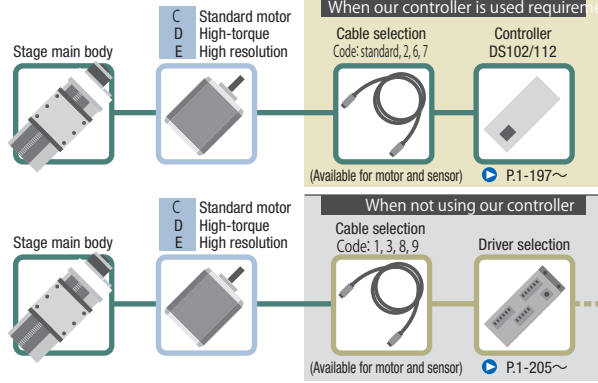


Motor option

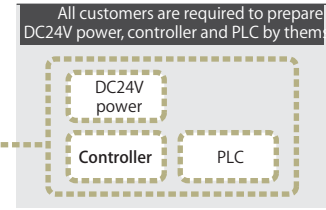
**C** Standard motor  
 Motor model  
 PK523HPB-C15

**D** High-torque  
 Motor model  
 PK525HPB

**E** High resolution  
 Motor model  
 PK523HPMB

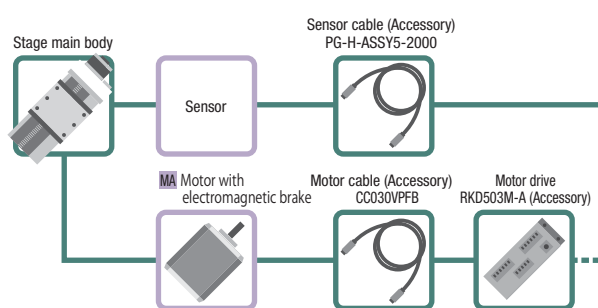


📌 Cable connection diagram shows page P.1-209~  
 📌 Pin arrangement and connection diagram shows page P.1-207~

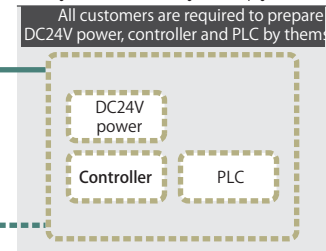


Motor option

**MA** With electromagnetic brake  
 Motor model  
 PKE545MC-A1

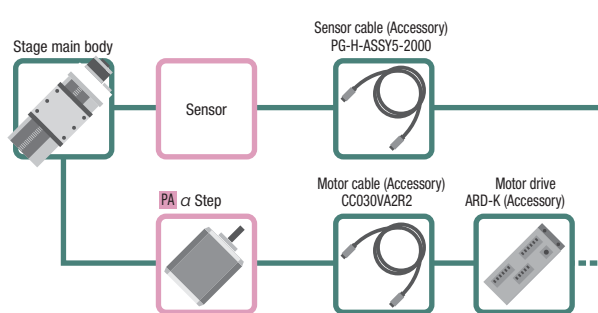


📌 Cable connection diagram shows page P.1-209~  
 📌 Pin arrangement and connection diagram shows page P.1-207~

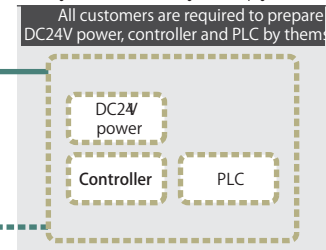


Motor option

**PA** α Step  
 Motor model  
 ARM24SAK

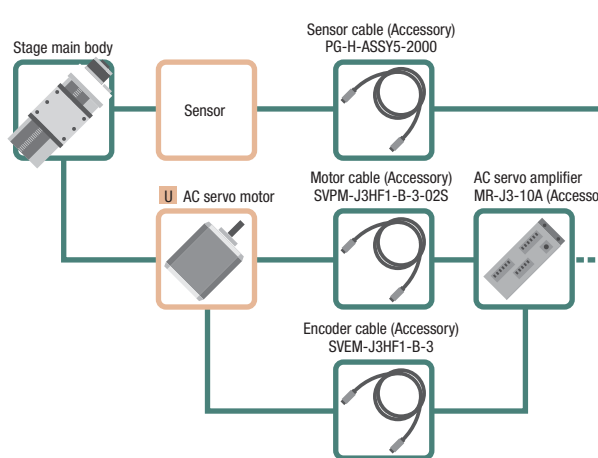


📌 Cable connection diagram shows page P.1-209~  
 📌 Pin arrangement and connection diagram shows page P.1-207~

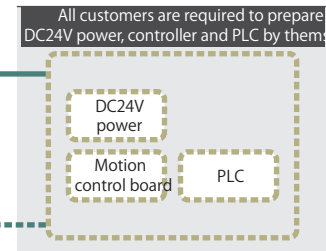


Motor option

**U** AC servo motor  
 Motor model  
 HF-KP053



📌 Cable connection diagram shows page P.1-209~  
 📌 Pin arrangement and connection diagram shows page P.1-207~



Motor code	C	D	E	MA	PA	U	
Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed	
Type	5 phase stepping motor 0.75A/Phase				α step motor	AC servo motor	
Model*	PK523HPB-C15	PK525HPB	PK523HPMB	PKE545MC-A1	ARM24SAK	HF-KP053	
Resolution	Lead 1mm	2μm/1μm		2μm/1μm	1μm (Set to 1000P/R)	18 bits encoder (262144P/R)	
	Full/Half Micro step (1/20 split)	0.1μm		0.1μm	—		
MAX speed	Lead 1mm	10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec	50mm/sec

\* Model is our own management model.

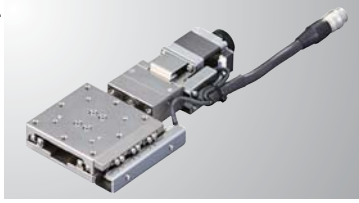
- Motorized Stage
- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller
- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

# Motorized Stage

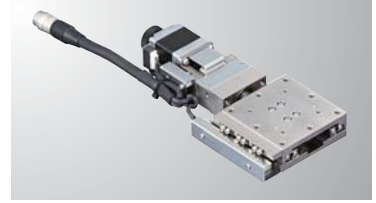
## X-axis Linear Ball Guide : PG413/PG513/PG615/PG715

Motorized Stage

PG615-L

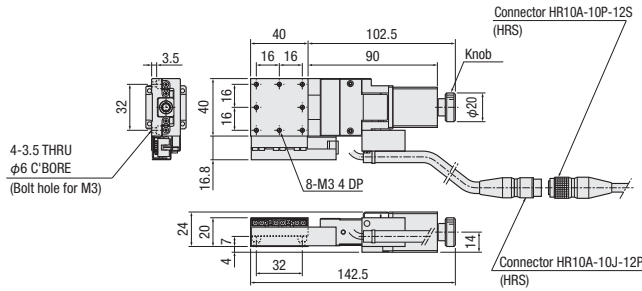


PG615-R

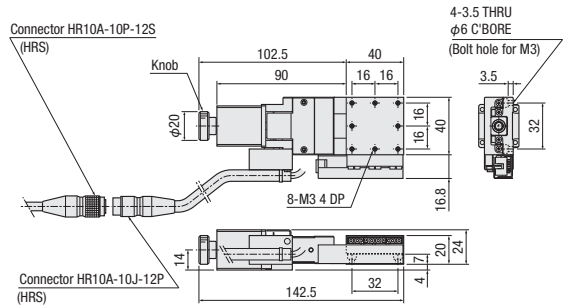


### Dimensional outline drawings

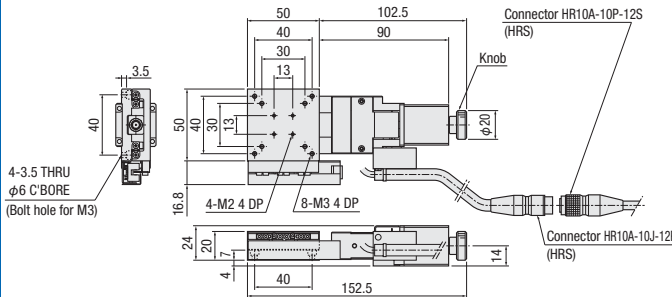
PG413-L



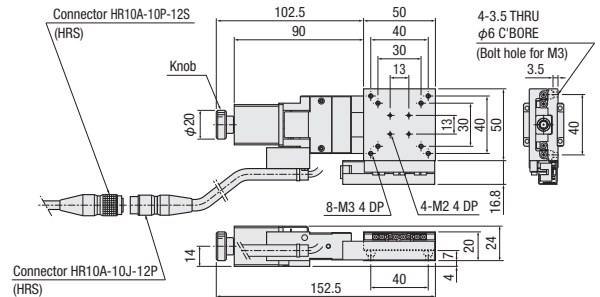
PG413-R



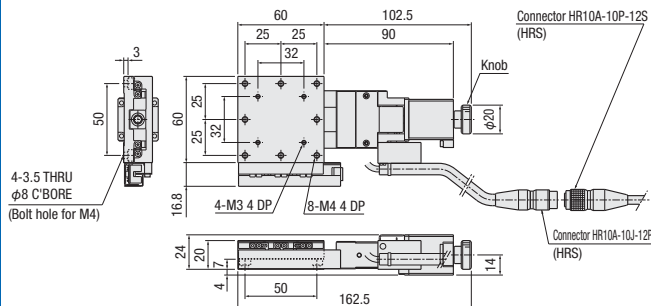
PG513-L



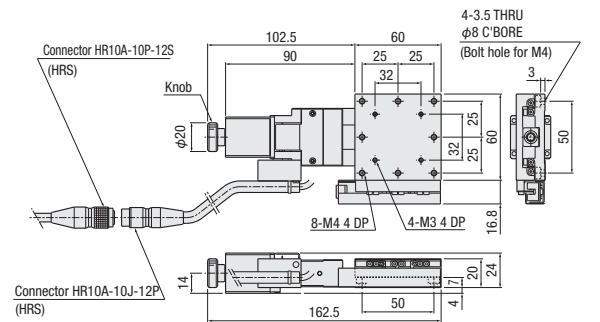
PG513-R



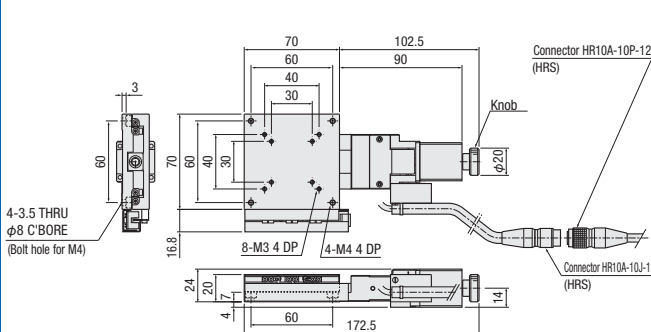
PG615-L



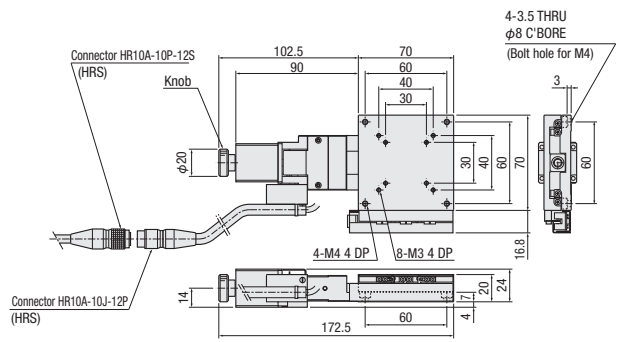
PG615-R



PG715-L



PG715-R



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

Dimensional outline drawings

**C** Standard motor

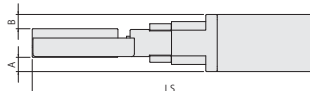
Motor model PK523HRB-C15

**D** High-torque

Motor model PK525HPB

**E** High resolution

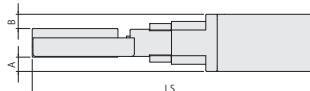
Motor model PK523HPMB



Model	C (Standard) / D (High-torque) / E (High resolution) Common			C (Standard)	D (High-torque)	E (High resolution)
	Motor size	A	B	LS		
PG413-****-□	□28	4	4	142.5	163	143.5
PG513-****-□				152.5	173	153.5
PG615-****-□				162.5	183	163.5
PG715-****-□				172.5	193	173.5

**MA** With electromagnetic brake

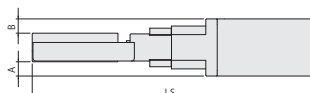
Motor model PKE545MC-A1



Model	MA (With electromagnetic brake)			C (Standard)	
	Motor size	A	B	LS	
PG413-****-MA	□42	11	11	180	142.5
PG513-****-MA				190	152.5
PG615-****-MA				200	162.5
PG715-****-MA				210	172.5

**PA** α step

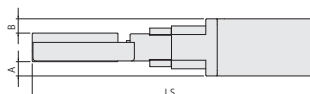
Motor model ARM24SAK



Model	PA (α step)			C (Standard)	
	Motor size	A	B	LS	
PG413-****-PA	□28	4	4	144	142.5
PG513-****-PA				154	152.5
PG615-****-PA				164	162.5
PG715-****-PA				174	172.5

**U** AC servo motor

Motor model HF-KP053



Model	U (AC servo motor)			C (Standard)	
	Motor size	A	B	LS	
PG413-****-U	□40	10	10	175.9	142.5
PG513-****-U				185.9	152.5
PG615-****-U				195.9	162.5
PG715-****-U				205.9	172.5

## X-axis Linear Ball Guide: PG430/PG530/PG650/PG750

Motorized Stage

PG650-L



PG650-R



RoHS

Model Selection code Option code  
**PG 430-L05AG-C 5**

1 2 3 4 5 6 7

☑ Cable P.1-207~  
 ☑ Electrical specification P.1-037~

### 1 Table size

4	40×60mm
5	50×70mm
6	60×100mm
7	70×110mm

### 2 Travel length

30	30mm
50	50mm

### 4 Sensor voltage

05	5V
24	24V

\* 05 [5V] for standard

### 5 Sensor logic

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

\* The sensor voltage/logic is different, but the external form dimension is the same.

\* If you choose 24V, not available our controller DS102/112.

### 7 Cable option

※ See page P.1-039~ for ORG2 compatible cable.

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for α step	—
U	Cable for servo motor	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

See page P.1-207,209~ for details of cable.  
 Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.

Motor/cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
MA	M	
PA	P	
U	U	

\* Cannot choose 450, 550, 630, 730 in combination with 1 and 2.

### 3 Sensor cover location

L	 L position
R	 Opposite hand

### 6 Motor option

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	α Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.

\* See page P.1-037~ for details of motor option.

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

SPEC				
Model	PG430-L05AG-C5	PG530-L05AG-C5	PG650-L05AG-C5	PG750-L05AG-C5
(Opposite hand)	PG430-R05AG-C5	PG530-R05AG-C5	PG650-R05AG-C5	PG750-R05AG-C5
Travel length	30mm		50mm	
Table size	40×60mm	50×70mm	60×100mm	70×110mm
Feed screw (Ball screw)	φ6 lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	0.6kg	0.78kg	1.08kg	1.16kg
Resolution (Pulse)	2μm (Full)/1μm (Half)			
MAX speed	10mm/sec			
Uni-directional positioning accuracy	Within 12μm			
Repeatability positioning accuracy	Within ±0.5μm			
Load capacity	10kgf [98N]			
Moment stiffness	Pitch 0.24/yaw 0.18/ roll 0.26 ["/N · cm]	Pitch 0.12/yaw 0.13/ roll 0.1 ["/N · cm]	Pitch 0.05/yaw 0.05/ roll 0.05 ["/N · cm]	Pitch 0.03/yaw 0.03/ roll 0.03 ["/N · cm]
Lost motion	Within 1μm			
Backlash	Within 0.5μm			
Straightness	Within 2μm			
Parallelism	Within 15μm			
Motion parallelism	Within 10μm			
Pitching/Yawing	Within 20"/Within 15"			
Limit sensor	Installed			
Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed Refer page P.1-039~			
Provided screw (Hexagon-headed bolt)	4 of M3—8		4 of M4—8	

※ Specification will be changed due to a motor. Refer page P.1-213.

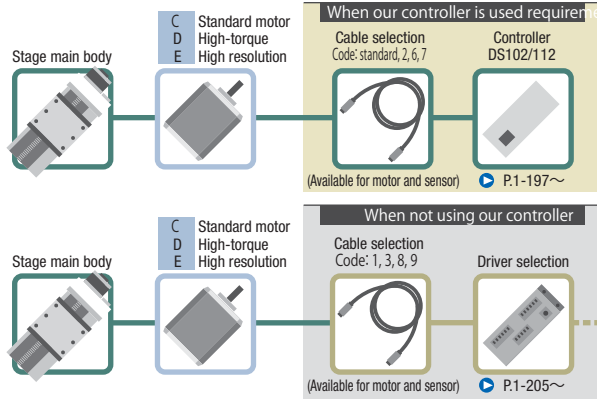
☉ The vertical load guideline 3kgf when use on Z-axis because of difference the load or speed.

Motor option

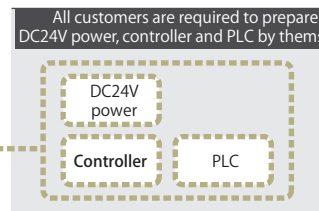
**C** Standard motor  
 Motor model  
 PK523HPB-C15

**D** High-torque  
 Motor model  
 PK525HPB

**E** High resolution  
 Motor model  
 PK523HPMB

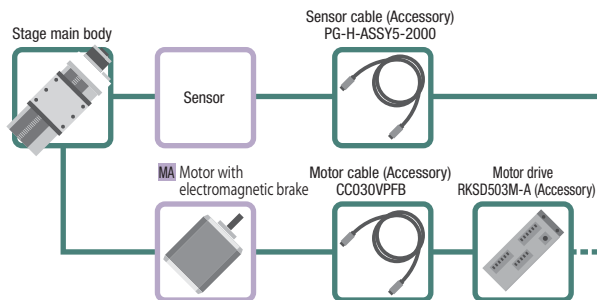


Cable connection diagram shows page P.1-209~  
 Pin arrangement and connection diagram shows page P.1-207~

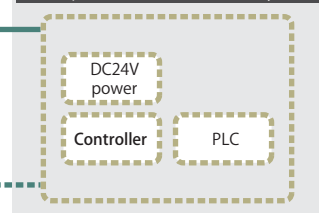


Motor option

**MA** With electromagnetic brake  
 Motor model  
 PKE545MC-A1

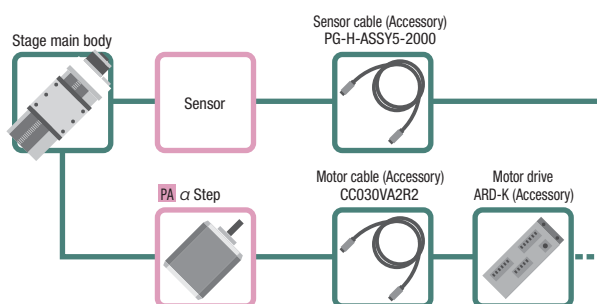


Cable connection diagram shows page P.1-209~  
 Pin arrangement and connection diagram shows page P.1-207~

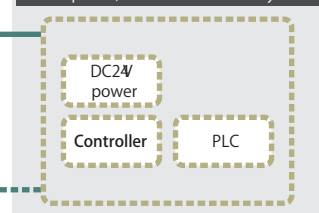


Motor option

**PA** α Step  
 Motor model  
 ARM24SAK

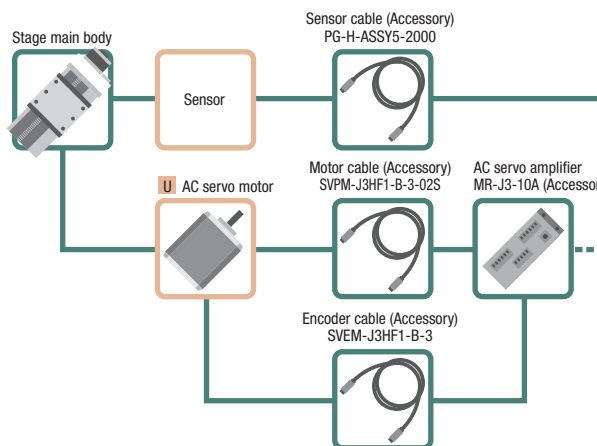


Cable connection diagram shows page P.1-209~  
 Pin arrangement and connection diagram shows page P.1-207~

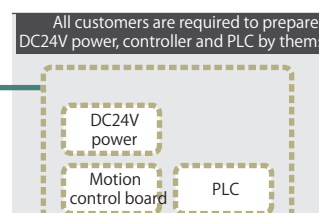


Motor option

**U** AC servo motor  
 Motor model  
 HF-KP053



Cable connection diagram shows page P.1-209~  
 Pin arrangement and connection diagram shows page P.1-207~



Motor code	C	D	E	MA	PA	U
Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type	5 phase stepping motor 0.75A/Phase				α step motor	AC servo motor
Model*	PK523HPB-C15	PK525HPB	PK523HPMB	PKE545MC-A1	ARM24SAK	HF-KP053
Resolution	Lead 1mm	2μm/1μm		1μm/0.5μm	2μm/1μm	18 bits encoder (262144P/R)
	Full/ Half	0.1μm		0.05μm	0.1μm	1μm (Set to 1000P/R)
MAX speed	Lead 1mm	10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec

\* Model is our own management model.

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

026

# Motorized Stage

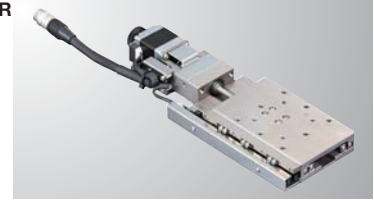
## X-axis Linear Ball Guide : PG430/PG530/PG650/PG750

Motorized Stage

PG650-L

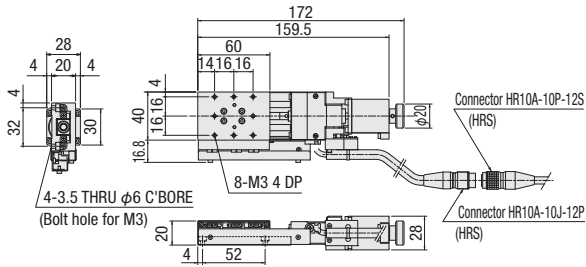


PG650-R

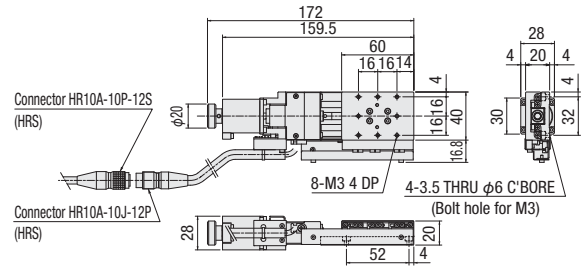


Dimensional outline drawings

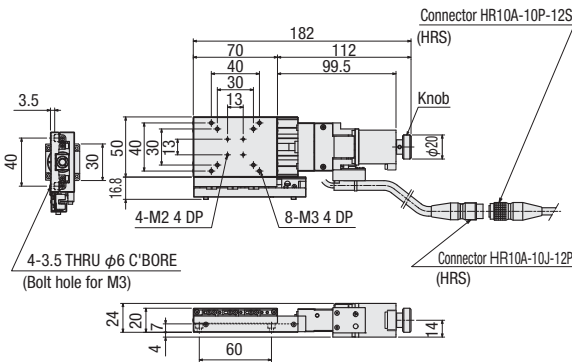
PG430-L



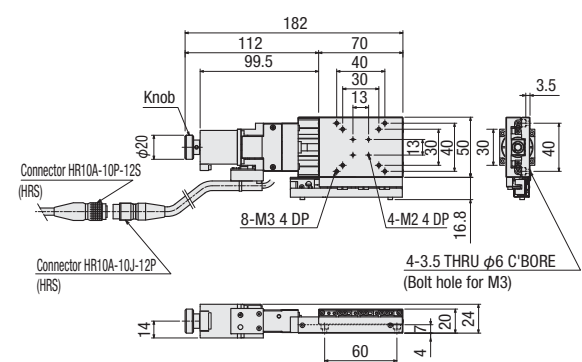
PG430-R



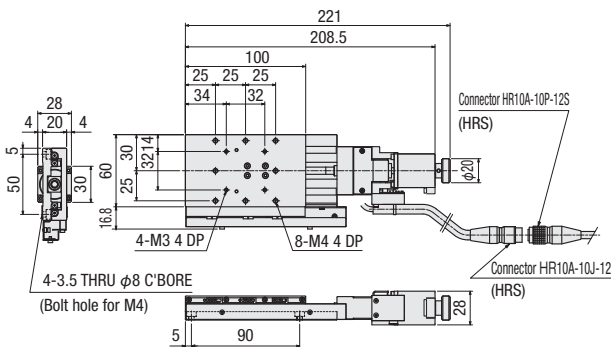
PG530-L



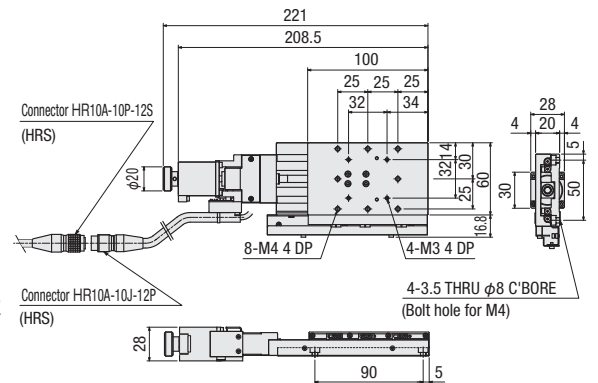
PG530-R



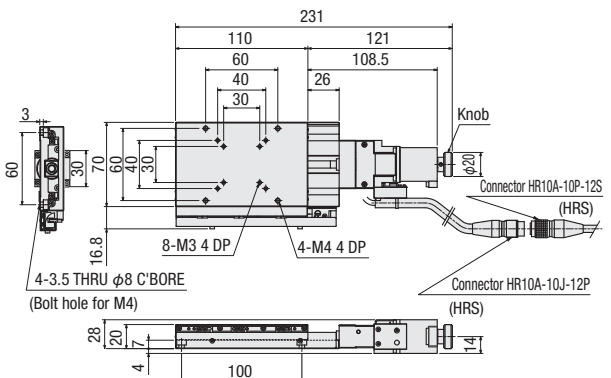
PG650-L



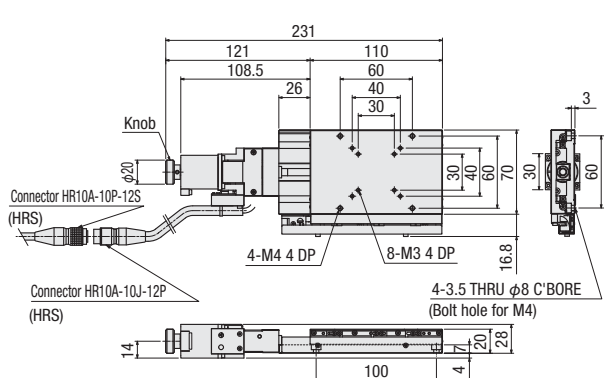
PG650-R



PG750-L



PG750-R



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

**Dimensional outline drawings**

**C** Standard motor

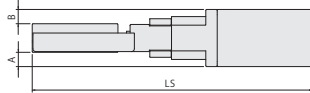
Motor model PK523HPB-C15

**D** High-torque

Motor model PK525HPB

**E** High resolution

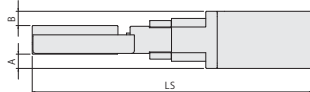
Motor model PK523HPMB



Model	C(Standard) / D (High-torque) / E (High-resolution) Common			C (Standard)	D (High-torque)	E (High resolution)
	Motor size	A	B	LS		
PG430-***-□	□28	4	4	171	191.5	172
PG530-***-□				181	201.5	182
PG650-***-□				220	240.5	221
PG750-***-□				230	250.5	231

**MA** With electromagnetic brake

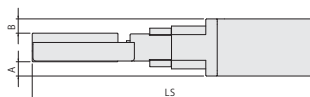
Motor model PKE545MC-A1



Model	MA (With electromagnetic brake)			C (Standard)	
	Motor size	A	B	LS	
PG430-***-M	□42	11	11	208.5	171
PG530-***-M				218.5	181
PG650-***-M				257.5	220
PG750-***-M				267.5	230

**PA** α step

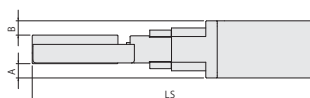
Motor model ARM46AC



Model	PA (α step)			C(Standard)	
	Motor size	A	B	LS	
PG430-***-P	□28	4	4	172.5	171
PG530-***-P				182.5	181
PG650-***-P				221.5	220
PG750-***-P				231.5	230

**U** AC servo motor

Motor model HF-KP053



Model	U (AC servo motor)			C (Standard)	
	Motor size	A	B	LS	
PG430-***-U	□40	10	10	204.4	171
PG530-***-U				214.4	181
PG650-***-U				253.4	220
PG750-***-U				263.4	230

## XY-axis Linear Ball Guide: PMG413/PMG513/PMG615/PMG715

Motorized Stage

PMG615-L



PMG615-R



RoHS

※A dedicated hex wrench for fixing bottom axis of XY is attached.

Model Selection code Option code  
**PMG413-L05AL-C5**

● Cable P.1-207~  
 ● Electrical specification P.1-037~

**1** Table size

4	□40mm
5	□50mm
6	□60mm
7	□70mm

\* Cannot choose 415, 515, 613, 713 in combination with **1** and **2**.

**2** Travel length

13	13mm
15	15mm

**4** Sensor voltage

05	5V
24	24V

\* 05 [5V] for standard

**5** Sensor logic

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

\* The sensor voltage/logic is different, but the external form dimension is the same.  
 \* If you choose 24V, not available our controller DS102/112.

**8** Cable option

※See page ● P.1-039~ for ORG2 compatible cable.

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for α step	—
U	Cable for servo motor	—

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 Not available non-cable.  
 See page ● P.1-207,209~ for details of cable.  
 Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.

Motor/cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
MA	M	
PA	P	
U	U	

**3 6** Identification mark

L	Sensor cover position is R for X and Y-axis. 
R	Sensor cover position is L for X and Y-axis. 

\* **3** and **6** are linked. Cannot choose L and R at the same time.

**7** Motor option

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	α Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.  
 \* See page ● P.1-037~ for details of motor option.

SPEC

Model	PMG413-L05AL-C5	PMG513-L05AL-C5	PMG615-L05AL-C5	PMG715-L05AL-C5
(Opposite hand)	PMG413-R05AR-C5	PMG513-R05AR-C5	PMG615-R05AR-C5	PMG715-R05AR-C5
Travel length	13mm		15mm	
Table size	40×40mm	50×50mm	60×60mm	70×70mm
Feed screw (Ball screw)	φ6 lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	1.0kg	1.2kg	1.7kg	1.8kg
Resolution (Pulse)	2μm (Full)/1μm (Half)			
MAX speed	10mm/sec			
Load capacity	9.5kgf [93.1N]	9.4kgf [92.1N]	9.3kgf [91.1N]	9.1kgf [89.2N]
Perpendicularity	Within 5μm/Full stroke			
Limit sensor	Installed			
Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed Refer page ● P.1-039~			
Provided screw (Hexagon-headed bolt)	4 of M3—8		4 of M4—8	
Uni-directional positioning accuracy	Within 6μm			
Repeatability positioning accuracy	Within ±0.5μm			
Lost motion	Within 1μm			
Backlash	Within 0.5μm			
Straightness	Within 1μm			
Pitching/Yawing	Within 15"/Within 10"			

※ Might be changed specification due to motors ● P.1-213~.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

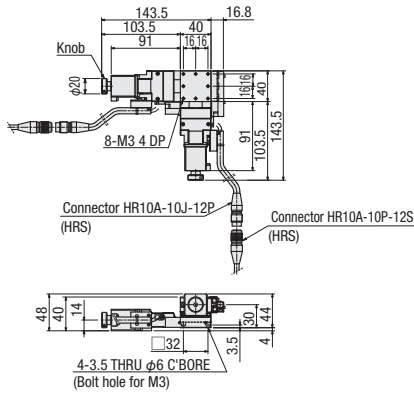
φ120

Other

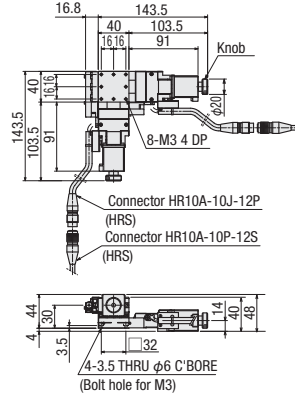


Dimensional outline drawings

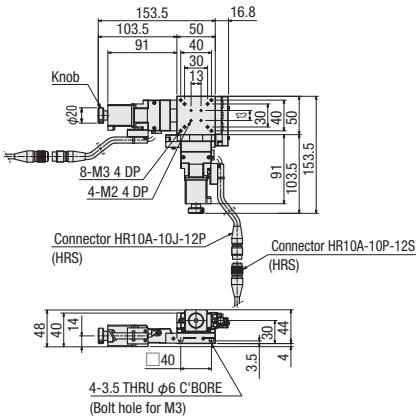
PMG413-L



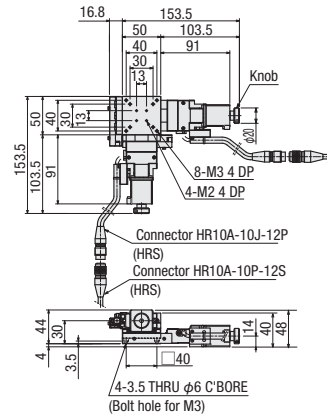
PMG413-R



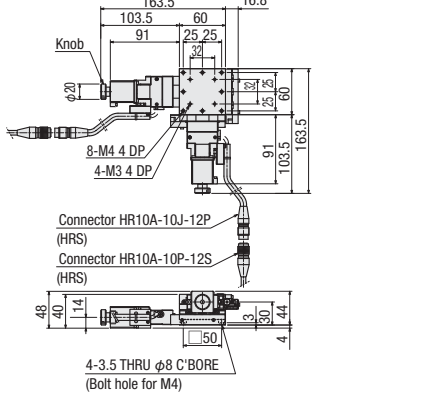
PMG513-L



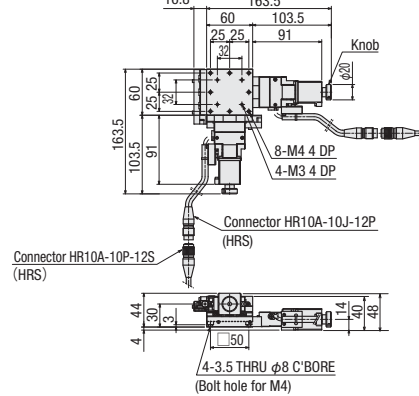
PMG513-R



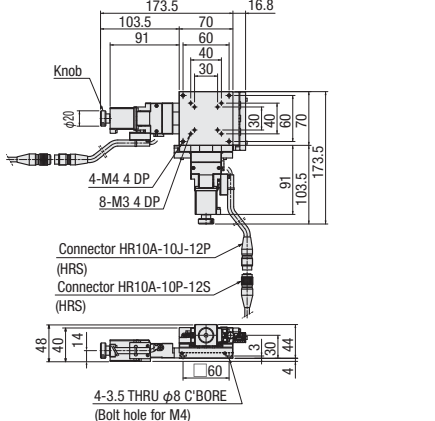
PMG615-L



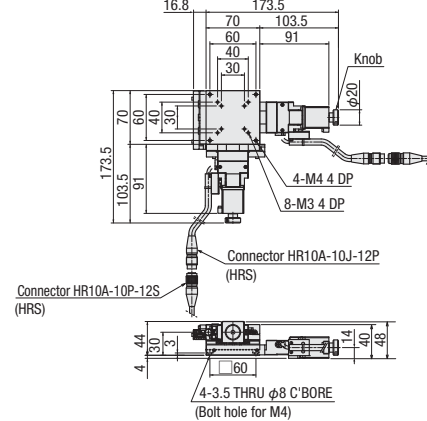
PMG615-R



PMG715-L



PMG715-R



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

## XY-axis Linear Ball Guide: PMG430/PMG530/PMG650/PMG750

PMG650-L



PMG650-R



※A dedicated hex wrench for fixing bottom axis of XY is attached.

Model Selection code Option code

**PMG 430-L05AL-C5**

1 2 3 4 5 6 7 8

🔗 Cable P.1-207~  
🔗 Electrical specification P.1-037~

**1 Table size**

4	40×60mm
5	50×70mm
6	60×100mm
7	70×110mm

\* Cannot choose 450, 550, 630, 730 in combination with **1** and **2**.

**2 Travel length**

30	30mm
50	50mm

**4 Sensor voltage**

05	5V
24	24V

\* 05 [5V] for standard

**5 Sensor logic**

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

\* The sensor voltage/logic is different, but the external form dimension is the same.  
\* If you choose 24V, not available our controller DS102/112.

**8 Cable option**

※See page P.1-039~ for ORG2 compatible cable.

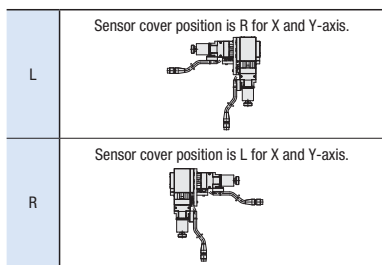
Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for α step	
U	Cable for servo motor	

\* One end loose position to only stage opposite side.  
\* The price includes M, P and U.  
Not available non-cable.  
See page P.1-207,209~ for details of cable.  
Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.

Motor/ cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
MA	M	
PA	P	
U	U	

**3 6 Identification mark**



\* **3** and **6** are linked. Cannot choose L and R at the same time.

**7 Motor option**

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	α Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-037~ for details of motor option.

**SPEC**

Model	PMG430-L05AL-C5	PMG530-L05AL-C5	PMG650-L05AL-C5	PMG750-L05AL-C5
<b>(Opposite hand)</b>	<b>PMG430-R05AR-C5</b>	<b>PMG530-R05AR-C5</b>	<b>PMG650-R05AR-C5</b>	<b>PMG750-R05AR-C5</b>
Travel length	30mm		50mm	
Table size	40×60mm	50×70mm	60×100mm	70×110mm
Feed screw (Ball screw)	φ6 lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	1.40kg	1.70kg	2.46kg	2.72kg
Resolution (Pulse)	2μm (Full)/ 1μm (Half)			
MAX speed	10mm/sec			
Load capacity	9.24kgf [90.5N]	9.04kgf [88.5N]	8.62kgf [84.4N]	8.44kgf [82.7N]
Perpendicularity	Within 10μm/Full stroke			
Limit sensor	Installed			
Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed Refer page P.1-039~			
Provided screw (Hexagon-headed bolt)	4 of M3—8		4 of M4—8	
Uni-directional positioning accuracy	Within 12μm			
Repeatability positioning accuracy	Within ±0.5μm			
Lost motion	Within 1μm			
Backlash	Within 0.5μm			
Straightness	Within 2μm			
Pitching/Yawing	Within 20" / Within 15"			

Note:PMG430,530,650,750 includes spacer for XY mounting.  
※ Might be changed specification due to motors P.1-213~.

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

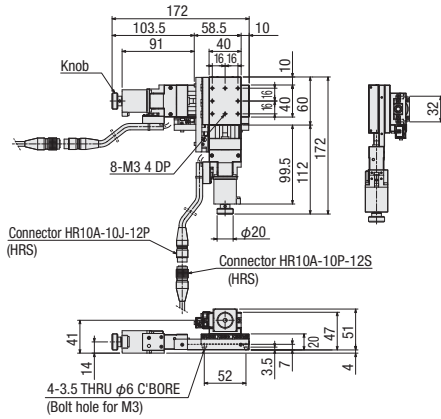
φ100

φ120

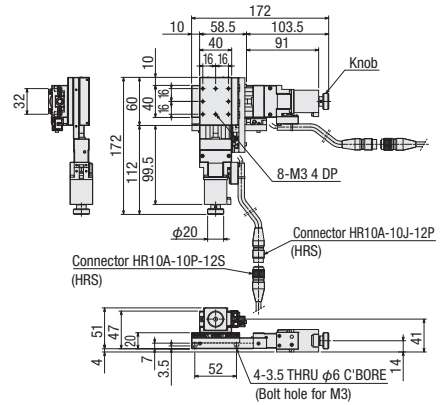
Other

Dimensional outline drawings

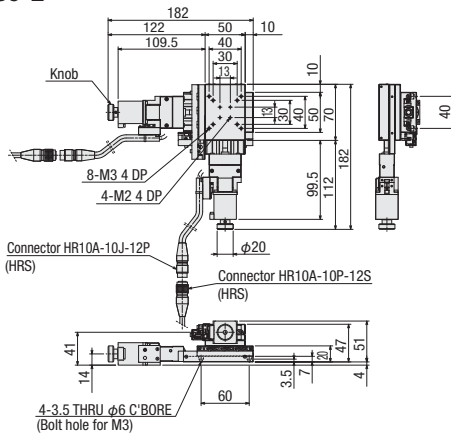
PMG430-L



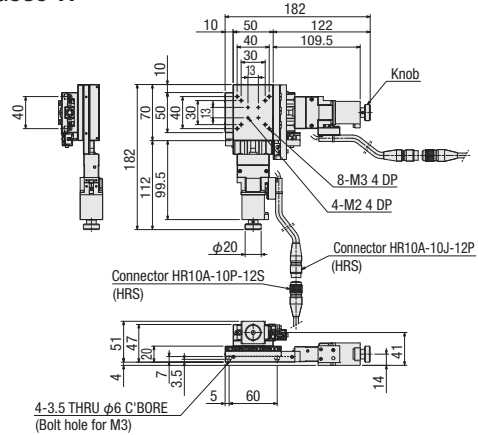
PMG430-R



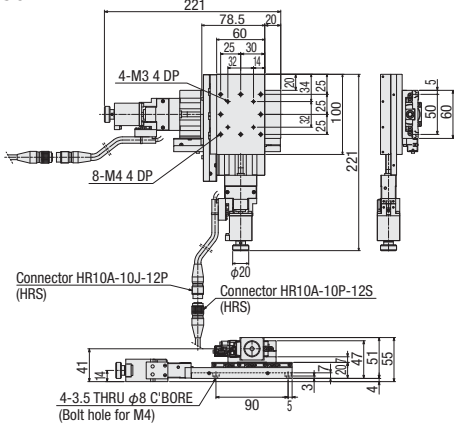
PMG530-L



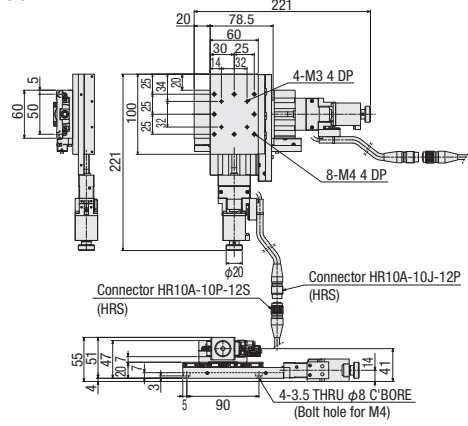
PMG530-R



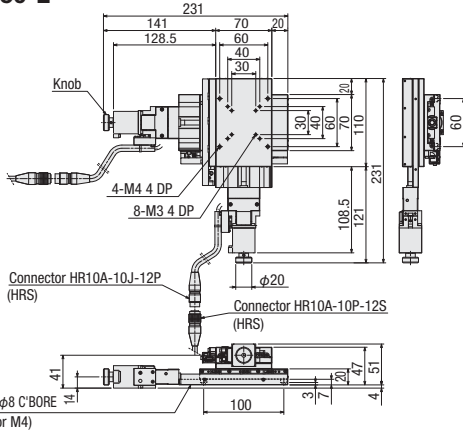
PMG650-L



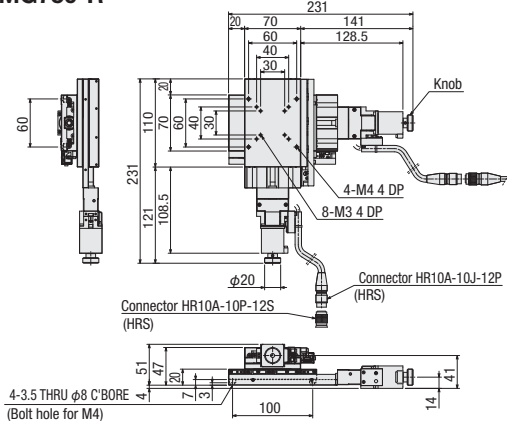
PMG650-R



PMG750-L



PMG750-R



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

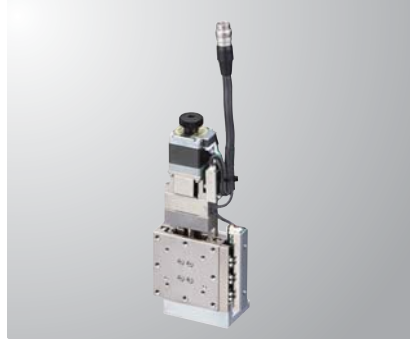
Other

## Z-axis Linear Ball Guide: PZG413/PZG513/PZG615/PZG715

PZG615-L



PZG615-R



Model Selection code Option code  
**PZG413-L05AG-C5**

1 2 3 4 5 6 7

● Cable P.1-207~  
 ● Electrical specification P.1-037~

### 1 Table size

4	<input type="checkbox"/> 40mm
5	<input type="checkbox"/> 50mm
6	<input type="checkbox"/> 60mm
7	<input type="checkbox"/> 70mm

\* Cannot choose 415, 515, 613, 713 in combination with 1 and 2.

### 2 Travel length

13	13mm
15	15mm

### 4 Sensor voltage

05	5V
24	24V

\* 05 [5V] for standard

### 5 Sensor logic

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

\* The sensor voltage/logic is different, but the external form dimension is the same.  
 \* If you choose 24V, not available our controller DS102/112.

### 7 Cable option

※ See page ● P.1-039~ for ORG2 compatible cable.

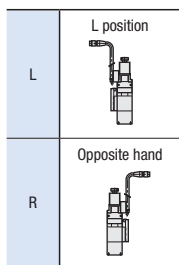
Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	
U	Cable for servo motor	

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 Not available non-cable.  
 See page ● P.1-207,209~ for details of cable.  
 Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.

Motor/cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
	MA	M
	PA	P
U	U	

### 3 Sensor cover location



### 6 Motor option

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.  
 \* See page ● P.1-037~ for details of motor option.

### SPEC

Model	PZG413-L05AG-C5	PZG513-L05AG-C5	PZG615-L05AG-C5	PZG715-L05AG-C5
(Opposite hand)	PZG413-R05AG-C5	PZG513-R05AG-C5	PZG615-R05AG-C5	PZG715-R05AG-C5
Travel length	13mm		15mm	
Table size	40×40mm	50×50mm	60×60mm	70×70mm
Feed screw (Ball screw)	φ6 lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	0.6kg	0.8kg	0.9kg	1.2kg
Resolution (Pulse)	2μm (Full)/1μm (Half)			
MAX speed	10mm/ sec			
Load capacity (Excitation)	5kgf [49N]			
Limit sensor	Installed			
Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed Refer page ● P.1-039~			
Provided screw (Hexagon-headed bolt)	4 of M3—10		4 of M4—12	
Uni-directional positioning accuracy	Within 6μm			
Repeatability positioning accuracy	Within ±0.5μm			
Lost motion	Within 1μm			
Backlash	Within 0.5μm			
Straightness	Within 1μm			
Pitching/Yawing	Within 15"/Within 10"			

※ Might be changed specification due to motors. See page ● P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

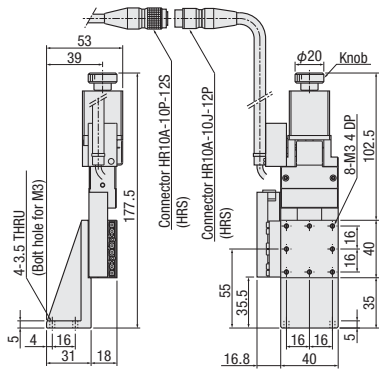
φ100

φ120

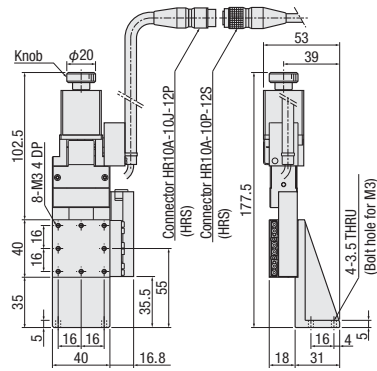
Other

Dimensional outline drawings

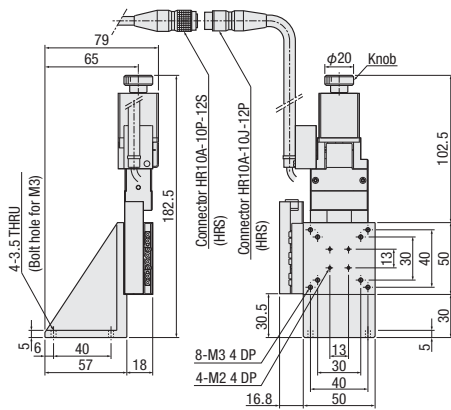
PZG413-L



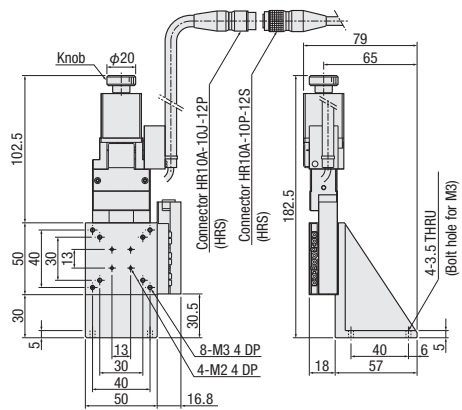
PZG413-R



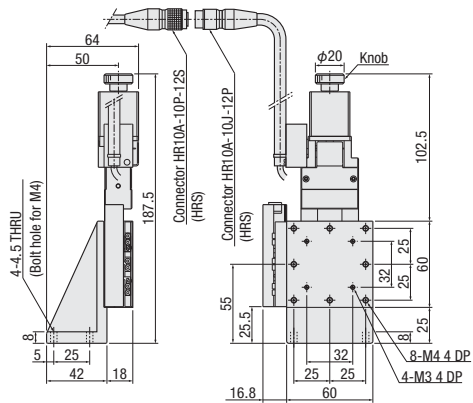
PZG513-L



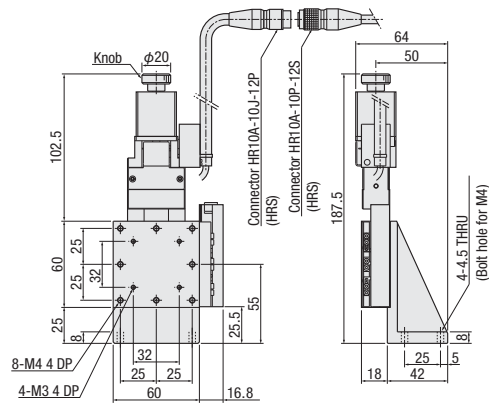
PZG513-R



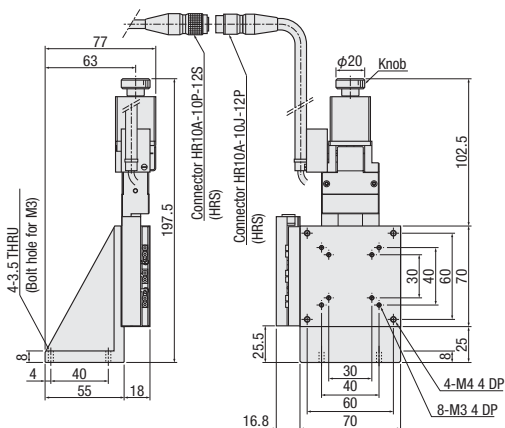
PZG615-L



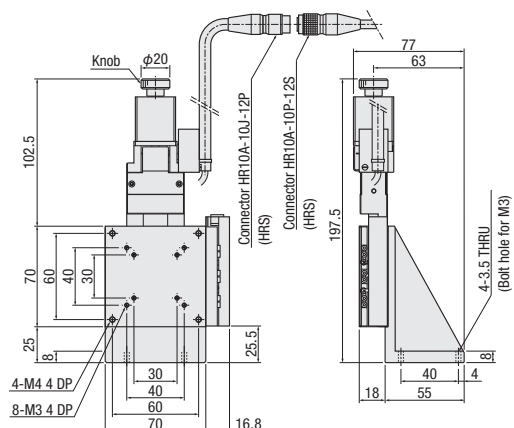
PZG615-R



PZG715-L



PZG715-R



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

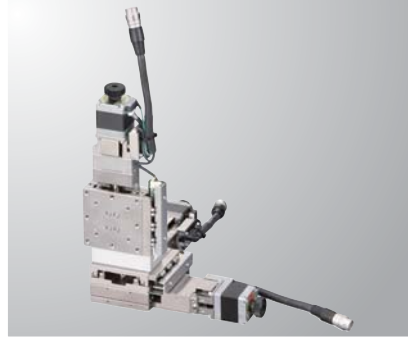
034

## XYZ-axis Linear Ball Guide: PMZG413/PMZG513/PMZG615/PMZG715

PMZG615-L



PMZG615-R



※A dedicated hex wrench for fixing bottom axis of XY is attached.

Model Selection code Option code

# PMZG 413-L05AG-C 5

1 2 3 4 5 6 7

● Cable P.1-207~  
● Electrical specification P.1-037~

### 1 Table size

4	□40mm
5	□50mm
6	□60mm
7	□70mm

\* Cannot choose 415, 515, 613, 713 in combination with 1 and 2.

### 2 Travel length

13	13mm
15	15mm

### 4 Sensor voltage

05	5V
24	24V

\* 05 [5V] for standard

\* The sensor voltage/logic is different, but the external form dimension is the same.

\* If you choose 24V, not available our controller DS102/112.

### 5 Sensor logic

A	N.C.
B	N.O.
C	Limit sensor is N.C., ORG1 and ORG2 are N.O.

### 7 Cable option

※ See page ● P.1-039~ for ORG2 compatible cable.

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

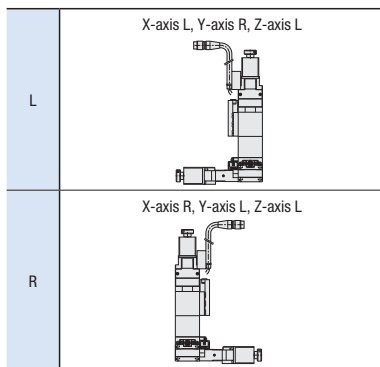
See page ● P.1-207,209~ for details of cable.

Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.

Motor/cable products list	Motor code	Cable code
	C, D, E	Blank, 1~9
MA	M	
PA	P	
U	U	

### 3 Sensor cover location specification



### 6 Motor option

Code	Specification
C	Standard
D	High-torque
E	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.

\* See page ● P.1-037~ for details of motor option.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

### SPEC

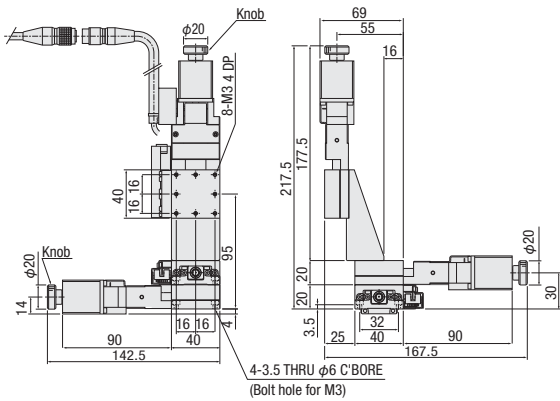
Model	PMZG413-L05AG-C5	PMZG513-L05AG-C5	PMZG615-L05AG-C5	PMZG715-L05AG-C5
(Opposite hand)	PMZG413-R05AG-C5	PMZG513-R05AG-C5	PMZG615-R05AG-C5	PMZG715-R05AG-C5
Travel length	13mm		15mm	
Table size	40×40mm	50×50mm	60×60mm	70×70mm
Feed screw (Ball screw)	φ6 lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	1.6kg	2.0kg	2.6kg	3.0kg
Resolution (Pulse)	2μm (Full)/ 1μm (Half)			
MAX speed	10mm/sec			
Load capacity (Excitation)	5kgf [49N]			
Perpendicularity	Within 5μm/ Full stroke (XY-axis)			
Limit sensor	Installed			
Origin sensor (ORG1)	Installed			
Slit origin sensor (ORG2)	Installed Refer page ● P.1-039~			
Provided screw (Hexagon-headed bolt)	4 of M3—8		4 of M4—8	

Single axis accuracy specification	
Uni-directional positioning accuracy	Within 6μm
Repeatability positioning accuracy	Within ±0.5μm
Lost motion	Within 1μm
Backlash	Within 0.5μm
Straightness	1μm
Pitching/Yawing	Within 15"/ Within 10"

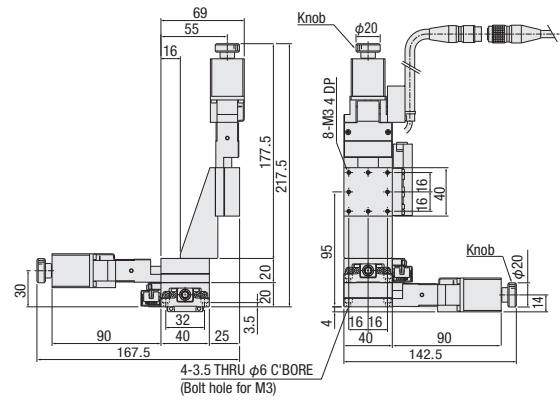
※ Might be changed specification due to motors. See page ● P.1-213~ for details.

**Dimensional outline drawings**

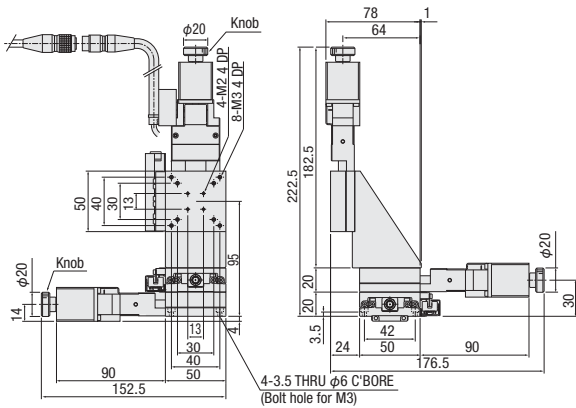
**PMZG413-L**



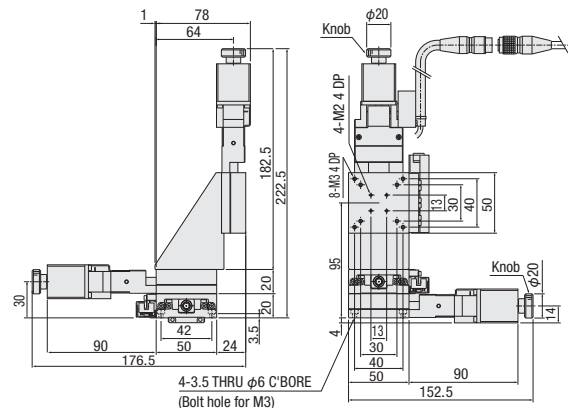
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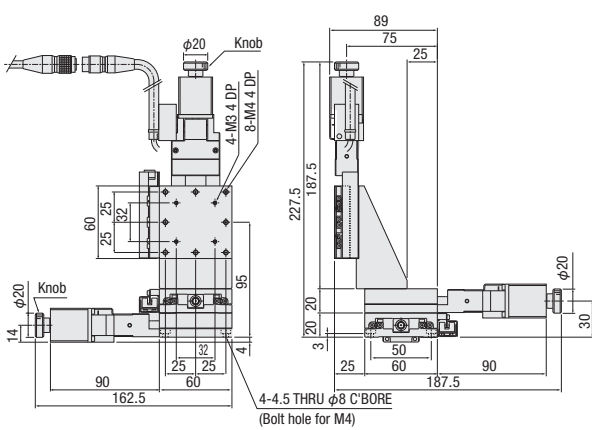
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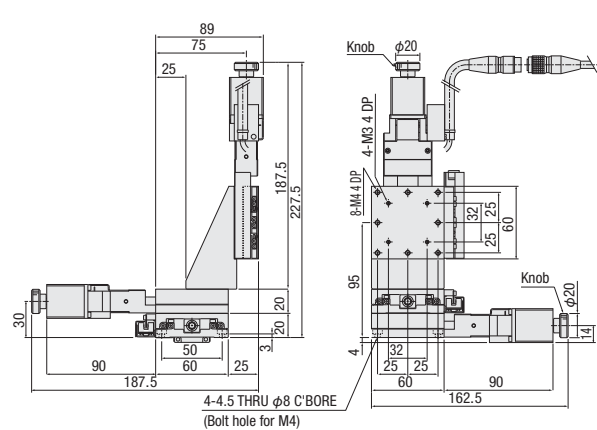
**PMZG513-R**



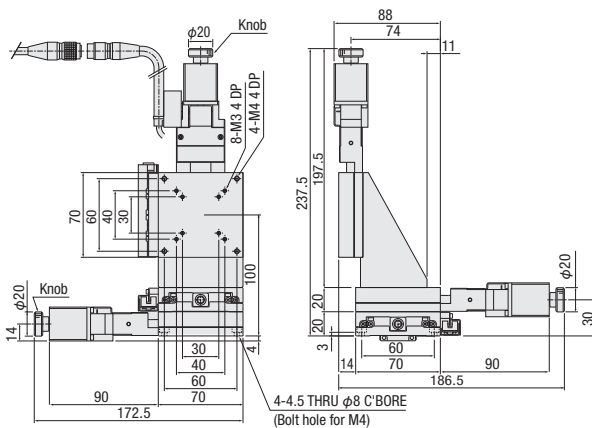
**PMZG615-L**



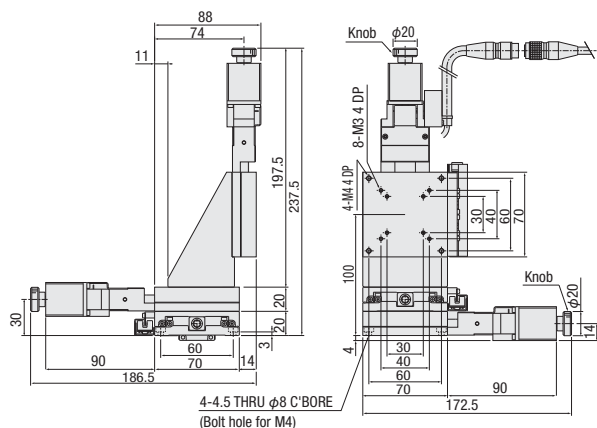
**PMZG615-R**



**PMZG715-L**



**PMZG715-R**



Motorized Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

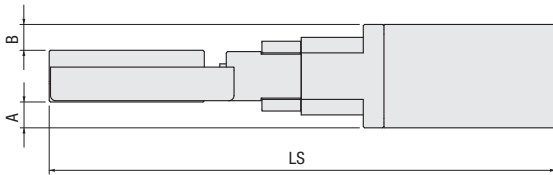
## Electrical Specification: PG Series

### Motor • Electrical specification

Motor code		C	D	E	MA	PA	U		
Models		PG413-****-C	PG413-****-D	PG413-****-E	PG413-****-MA	PG413-****-PA	PG413-****-U		
		PG513-****-C	PG513-****-D	PG513-****-E	PG513-****-MA	PG513-****-PA	PG513-****-U		
		PG615-****-C	PG615-****-D	PG615-****-E	PG615-****-MA	PG615-****-PA	PG615-****-U		
		PG715-****-C	PG715-****-D	PG715-****-E	PG715-****-MA	PG715-****-PA	PG715-****-U		
		PG430-****-C	PG430-****-D	PG430-****-E	PG430-****-MA	PG430-****-PA	PG430-****-U		
		PG530-****-C	PG530-****-D	PG530-****-E	PG530-****-MA	PG530-****-PA	PG530-****-U		
		PG650-****-C	PG650-****-D	PG650-****-E	PG650-****-MA	PG650-****-PA	PG650-****-U		
	PG750-****-C	PG750-****-D	PG750-****-E	PG750-****-MA	PG750-****-PA	PG750-****-U			
Motor Specification (*1)	Type	5 phase stepping motor			0.75A/Phase	α step motor		AC servo motor	
	Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed		
	Model (*2)	PK523HPB-C15	PK525HPB	PK523HPMB	PKE545MC-A1	ARM24SAK	HF-KP053		
	Electromagnetic brake	-			Installed	-			
	Maker	Oriental Motor Co.,Ltd.						Mitsubishi Electric corporation	
	Step angle (Position detector)	0.72°			0.36°	0.72°	0.36° (Set to 1000P/R)	18 bits encoder (262144P/R)	
	Mass	0.1kg	0.2kg	0.11kg	0.52kg	0.15kg	0.35kg		
	Motor size	□ size		28mm	42mm		28mm	40mm	
		L size		61.5mm	42mm		45mm	66.4mm	
	Excitation (moment) maximum torque	0.033N·m	0.073N·m	0.038N·m	0.240N·m		0.055N·m		0.480N·m
Driver type	P.1-205~				RKD507M-A	ASD10A-K	MR-J3-10A		
Input power (Voltage • frequency)					Single phase AC100-115V 50/60Hz	DC24V±10%	Three and single phase AC200-230V 50/60Hz		
Sensor	Limit sensor	Installed						-	
	Origin sensor (ORG1)	Installed						-	
	Slit origin sensor (ORG2)	Installed						-	
	Model	Photo microsensor EE-SX384, EE-SX484 (Omron Co.,Ltd.) (Slit origin sensor will be PM-L24(Panasonic Industrial Devices SUNX) in code M)							
	Power voltage	DC5V±5% (DC24V±10% Option) (PM-L24 power voltage: DC5~24V±10%)							
	Consumption current	100mA or less (25mA per 1 sensor) (PM-L24 consumption current: 15mA or less)							
	Control output	EE-SX384/EE-SX484: NPN open collector output DC5~24V 16mA or less Residual voltage 0.4V or less when the load current is 16mA PM-L24: NPN open collector output DC30V or less/50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA							
Output logic	EE-SX384: Output transistor is ON at the light shield (continuity) EE-SX484: Output transistor is OFF at the light shield (Non-continuity) PM-L24: Output transistor is OFF at the light shield (Non-continuity)								
Connector	Motor	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		350782-1 (Tyco Electronics Japan G.K.)	5557-10R (Japan Molex)	Motor cable	-	
		Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		350720-1 (Tyco Electronics Japan G.K.)	5559-10P (Japan Molex)	Encoder	-	
	Sensor	Limit sensor	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		S5B-ZR-SM4-TF (LF) (SN) (JST Co.,Ltd.)			
			Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		ZHR-5 (JST Co.,Ltd.)			
		Origin sensor (ORG1)	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		-			
			Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		-			
Accuracy specification	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm/0.5μm	18 bits encoder (262144P/R)	
		Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	-		
		MAX speed	10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec		50mm/sec

\*1 See page P.1-213~ for details of single motor specification.  
 \*2 Model is our own management model.  
 \* The electric specification of XY (PMG), Z (PZG), XYZ (PMZG) are the same.  
 [M/P]; Please see our web site for more details about motors.

### Dimensional outline drawings



Motor code	Size □ [mm]	A	B	LS							
				PG413	PG513	PG615	PG715	PG430	PG530	PG650	PG750
C	28	4	4	142.5	152.5	162.5	172.5	171	181	220	230
D	28	4	4	163	173	183	193	191.5	201.5	240.5	250.5
E	28	4	4	143.5	153.5	163.5	173.5	172	182	221	231
MA	42	11	11	182	192	202	212	210.5	220.5	259.5	269.5
PA	28	4	4	144	154	164	174	172.5	182.5	221.5	231.5
U	40	10	10	175.9	185.9	195.9	205.9	204.4	214.4	253.4	263.4



Pin allocation · Connection diagram

Motor code	Pin allocation · Connection diagram (Motor)	Pin allocation · Connection diagram (Sensor)																																																												
C · D · E	<p>[Motor and sensor pin allocation (the same)]</p> <p>[Motor and sensor connection diagram (the same)]</p>	<p>(Usage sensor for each logis)</p> <table border="1"> <thead> <tr> <th>Sensor logic</th> <th>CWLS,CCWLS</th> <th>ORG1</th> <th>ORG2</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>EE-SX484</td> <td>EE-SX384</td> <td>EE-SX384</td> </tr> <tr> <td>B</td> <td>EE-SX384</td> <td>EE-SX484</td> <td>EE-SX484</td> </tr> <tr> <td>C</td> <td>EE-SX484</td> <td>EE-SX384</td> <td>EE-SX484</td> </tr> </tbody> </table> <p>* Please select the cable from the option code.                  ※ See page P.1-211 for details of cable.</p>	Sensor logic	CWLS,CCWLS	ORG1	ORG2	A	EE-SX484	EE-SX384	EE-SX384	B	EE-SX384	EE-SX484	EE-SX484	C	EE-SX484	EE-SX384	EE-SX484																																												
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C	EE-SX484	EE-SX384	EE-SX484																																																											
MA	<p>[Pin allocation (motor)]</p> <p>[Connector diagram (motor)]</p> <p>※ Cable model: STOP-RK2-A-3 See page P.1-211 for details.</p>	<p>[Connector diagram (sensor)]</p> <p>※ Attached sensor cable model: PG-H-ASSY5-2000 See page P.1-212 for details.</p> <p>※ See page P.1-212 for details of slit origin sensor PM-L24</p>																																																												
PA	<p>Driver-side</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Color</th> <th>Pin</th> <th>Main body side</th> </tr> </thead> <tbody> <tr><td>1</td><td>White</td><td>1</td><td></td></tr> <tr><td>2</td><td>Purple</td><td>2</td><td></td></tr> <tr><td>3</td><td>Red</td><td>3</td><td></td></tr> <tr><td>4</td><td>Blue</td><td>4</td><td></td></tr> <tr><td>6</td><td>Black</td><td>6</td><td></td></tr> <tr><td>7</td><td>Brown</td><td>7</td><td></td></tr> <tr><td>8</td><td>Green</td><td>8</td><td></td></tr> <tr><td>9</td><td>Yellow</td><td>9</td><td></td></tr> <tr><td>10</td><td>Shield</td><td>10</td><td></td></tr> </tbody> </table> <p>Motor cable model: STOP-AS1-B-3 See page P.1-211 for details.</p>	Pin	Color	Pin	Main body side	1	White	1		2	Purple	2		3	Red	3		4	Blue	4		6	Black	6		7	Brown	7		8	Green	8		9	Yellow	9		10	Shield	10		<p>[Connector diagram (sensor)]</p> <p>※ Sensor cable model: PG-H-ASSY5-2000 See page P.1-212 for details.</p>																				
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3	Red	3																																																												
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6	Black	6																																																												
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U	<p>Driver-side</p> <table border="1"> <thead> <tr> <th>Mark</th> <th>Color</th> <th>Pin</th> <th>Signals</th> <th>Main body side</th> </tr> </thead> <tbody> <tr><td>FG</td><td>Green/Yellow</td><td>1</td><td>FG</td><td></td></tr> <tr><td>U</td><td>Red</td><td>2</td><td>UPhase</td><td></td></tr> <tr><td>V</td><td>White</td><td>3</td><td>VPhase</td><td></td></tr> <tr><td>W</td><td>Blue</td><td>4</td><td>WPhase</td><td></td></tr> </tbody> </table> <p>Motor cable model: SVPM-J3HF1-B-3-02S See page P.1-211 for details.</p> <table border="1"> <thead> <tr> <th>Signals</th> <th>Pin</th> <th>Color</th> <th>Pin</th> <th>Signals</th> </tr> </thead> <tbody> <tr><td>P5</td><td>1</td><td>White</td><td>3</td><td>P5</td></tr> <tr><td>LG</td><td>2</td><td>Black</td><td>6</td><td>LG</td></tr> <tr><td>MR</td><td>3</td><td>Red</td><td>5</td><td>MR</td></tr> <tr><td>MRR</td><td>4</td><td>Black</td><td>4</td><td>MRR</td></tr> <tr><td>BAT</td><td>9</td><td>Green</td><td>2</td><td>BAT</td></tr> <tr><td>SD</td><td>Plate</td><td>Shield</td><td>9</td><td>SD</td></tr> </tbody> </table> <p>encoder model: SVEM-J3HF1-B-3 See page P.1-211 for details.</p>	Mark	Color	Pin	Signals	Main body side	FG	Green/Yellow	1	FG		U	Red	2	UPhase		V	White	3	VPhase		W	Blue	4	WPhase		Signals	Pin	Color	Pin	Signals	P5	1	White	3	P5	LG	2	Black	6	LG	MR	3	Red	5	MR	MRR	4	Black	4	MRR	BAT	9	Green	2	BAT	SD	Plate	Shield	9	SD	<p>[Connector diagram (sensor)]</p> <p>※ Sensor cable model: PG-H-ASSY5-2000 See page P.1-212 for details.</p>
Mark	Color	Pin	Signals	Main body side																																																										
FG	Green/Yellow	1	FG																																																											
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LG	2	Black	6	LG																																																										
MR	3	Red	5	MR																																																										
MRR	4	Black	4	MRR																																																										
BAT	9	Green	2	BAT																																																										
SD	Plate	Shield	9	SD																																																										

Cable type

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

Motor code [MA · PA · U] compatible cable

One set in motor driver and motor cable (encoder).

Motor code	Cable code	Driver type	Motor cable	Encoder cable	Sensor cable
MA	M	RKSD503M-A (Oriental Motor Co.,Ltd.)	CC030VPFB P.1-211 Motor code MA	—	PG-H-ASSY5-2000 P.1-212 Refer the cable connection diagram
PA	P	ARD-K (Oriental Motor Co.,Ltd.)	CC030VA2R2 P.1-211 Motor code PA	—	
U	U	MR-J3-10A (Mitsubishi Electric corporation)	SVPM-J3HF1-B-3-02S P.1-211 Motor code U	SVEM-J3HF1-B-3 P.1-211 Motor code U	

Cable connection diagram shows page P.1-209~  
 Great deal purchase both of cable and code.

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

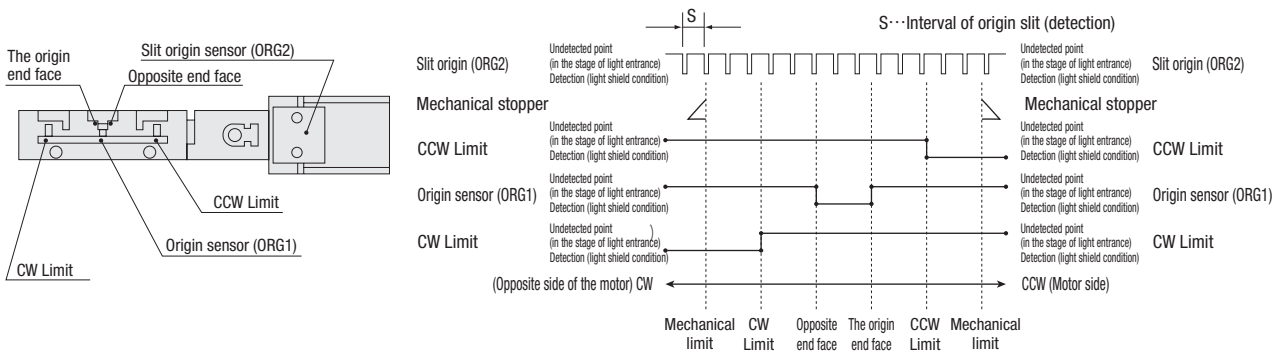
Other

# Motorized Stage

## Electrical Specification: PG Series

Motorized Stage

### Timing chart



Unit [mm]	Direction of CW ← → Direction of CCW						
	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Origin	Mechanical limit	Mechanical limit
<b>PG413-PG513</b>	Return to origin	8.0	7.5	2	0	6.5	7.0
<b>PG615-PG715</b>	Return to origin	9.0	8.5	2	0	7.5	8.0
<b>PG430-PG530</b>	Return to origin	16.5	16.0	2	0	15.0	15.5
<b>PG650-PG750</b>	Return to origin	26.5	26.0	2	0	25.0	25.5
<b>The same</b>							Detection clearance of slit origin S=1

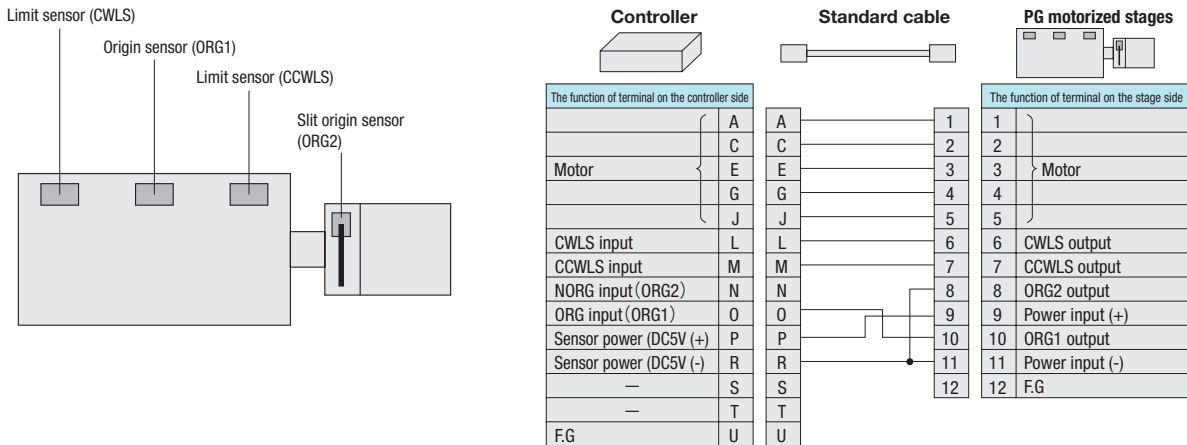
\* Return to origin means use DS102/DS112 series controller for the return to origin type 3.

\* The coordinate value should be on the design flaw. Dimension error may occur about plus or minus 0.5mm.

### Built-in sensor

PG series have built-in sensors as below.

■ The connecting diagram that connected to our controller using standard attached cable is shown as below.



The CWLS(pin#6) and CCWLS(pin#7) on the motorized stage side are connected to CWLS(Lpin) and CCWLS(Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V(-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a result, return to origin should be done without the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

● About a correspondence cable for a slit origin sensor (ORG2)! ※ See page P.1-207 for details.

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors. Also please note that the type is different from recommendation return to origin. Should be selected cable code 5 (without cable), and order the cable for four. When use all of 4 sensors, please select the cable for 4 sensors from page P.1-207~.

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

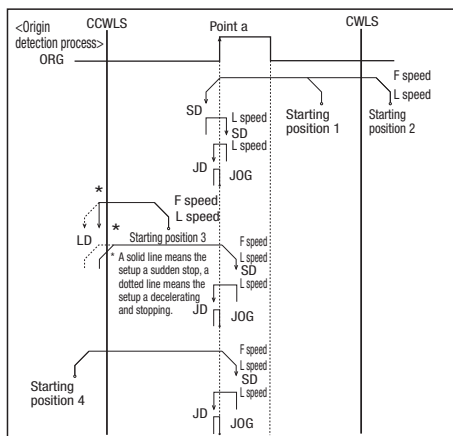
φ100

φ120

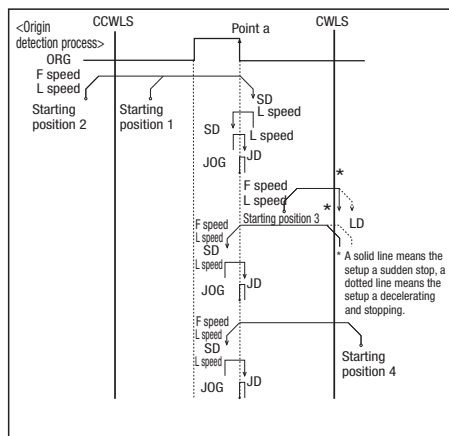
Other

**PG series recommendation return to origin method**

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.

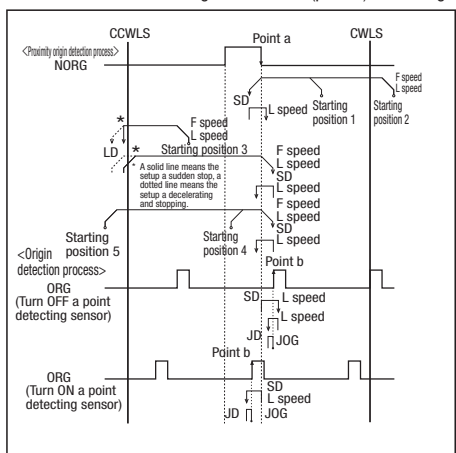


**[Type9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

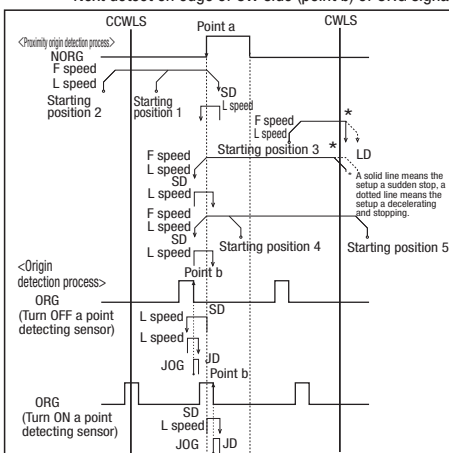
**[Type10]** After finished Type4, perform detected process for CW edge of TIMING signal.

● Select return to origin type from the followings when use the slit origin sensor (ORG2).

**[Type1]** Detect in the direction of CCW and perform detected process for CW edge (point a) of NORG signal. Next detect an edge of CCW side (point b) of ORG signal.



**[Type2]** Detect in the direction of CW and perform detected process for CCW edge (point a) of NORG signal. Next detect on edge of CW side (point b) of ORG signal.



**[Type7]** After finished type1, perform detected process for CCW edge (point c) of TIMING signal.

**[Type8]** After finished type2, perform detected process for CW edge (point c) of TIMING signal.

Return to origin sequence ▶ P.1-201~

**Adaptive driver**

■ Driver ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	Micro step (1~1/250 [16 steps])	Normal (Full/Half)

AC100V input

Model	RKD507-A
Divisions	Micro step (1~1/250 [16 steps])

**Adaptive stepping motor controller**

■ Controller ▶ P.1-197~

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

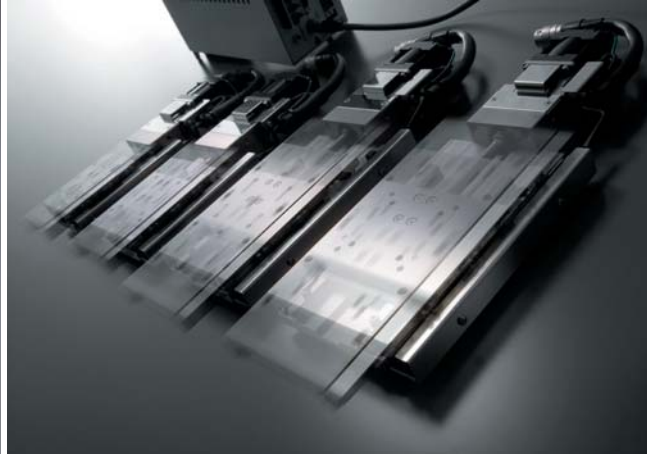
CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

**Integrated upper-lower plate and guide.**  
**Realized "High rigidity, High precision, Low price"**



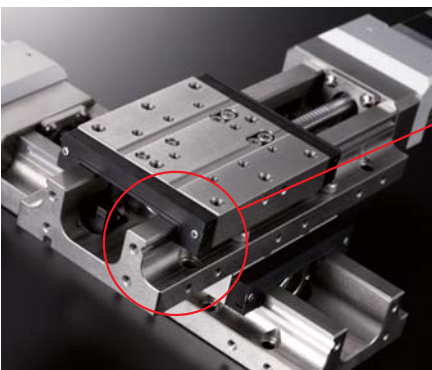
**High rigidity** Minimal fastener component. Realized high rigidity because it made from stainless.

\*KXT is made by steel.

**High precision** Travel accuracy and parallelism of upper-lower plate is performed highly because a guide is processed on a chassis directly.

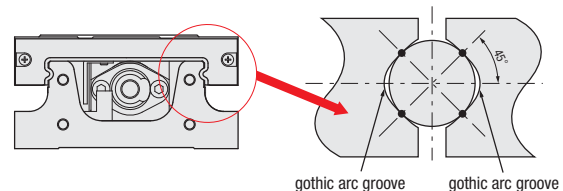
**Low price** Realized significant cost saving by an original production system.

### Linear ball guide configuration



#### ● High rigidity

The gothic arc groove ball guide is processed directly on a main body upper-lower plate. Gothic ark groove is made by 2 arcs, so it contact 2 points for one side. Realized high rigidity with 4 points contacting configuration, such as the figures below.



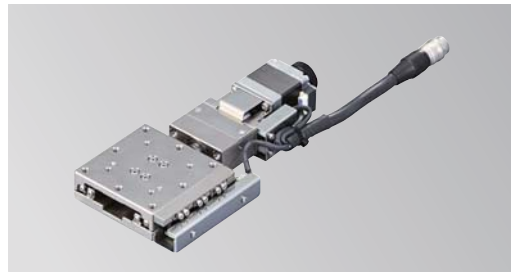
## High performance

### ■ KXT series



Specialized necessary functions. Outstanding cost performance.

### ■ PG series



Thin type with integration guide.  
Available wide range variation such as table-size and sensor options.

### ■ CAVE-X POSITIONER KXG series



Much compact than former linear ball guide and cross-roller guide stages.

### ■ CAVE-X POSITIONER KXL series



Selectable travel range between 30mm to 300mm.

## For proper operation

### ▽ Mounting

Fix at least 4 corners with attached screws.

### ▽ About the object that is mounted upper or lower the stage.

When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.

### ▽ Positioning

#### ■ Positioning of stage mounting

All products SPEC shows must be shown flat setting condition. Pay attention to mount such as up side down, vertical on the side and horizontal on the side. Load capacity and accuracy might be changed by the positioning. Please feel free to ask us for more information.

# Motorized Stage

CAVE-X POSITIONER

## X-axis Linear Ball Guide : KXG06020/KXG06030

Motorized Stage

KXG06020

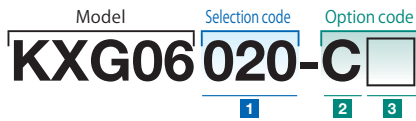


KXG06030



See page [P.009](#)

■ The drive unit areas are coated in clean grease.



[Cable P.1-207~](#)  
[Electrical specification P.1-051~](#)

### 1 Travel length

020	20mm
030	30mm

### 2 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)

\* Code MA · PA is the set of driver and cable.  
 \* See page [P.1-051~](#) for details of Motor option.

### 3 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
 \* The price includes M and P.  
 Not available non-cable.  
 See page [P.1-207,209~](#) for details of cable.  
 Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/ cable products list	Motor code	Cable code
	C, F, G	Blank, A~H, J
MA	M	
PA	P	

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

### SPEC

Model	KXG06020-C	KXG06020-F	KXG06020-G	KXG06030-C	KXG06030-F	KXG06030-G
Travel length	20mm			30mm		
Table size	60×60mm			60×70mm		
Feed screw (Ball screw)	φ8 lead 1					
Guide	Linear ball guide					
Main materials-Finishing	Stainless—Opposite side of the end face finishing					
Weight	0.78kg	0.87kg	0.78kg	0.9kg	0.99kg	0.9kg
Resolution (Pulse)	Full/ Half	2μm/1μm		2μm/1μm		1μm/0.5μm
	Microstep	0.1μm (1/20 on resolution)		0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)
MAX speed	20mm/sec	30mm/sec	20mm/sec	20mm/sec	30mm/sec	20mm/sec
Uni-directional positioning accuracy	Within 5μm					
Repeatability positioning accuracy	Within ±0.5μm					
Load capacity	5kgf [49N]					
Moment stiffness	Pitch 0.08/yaw 0.05/roll 0.05 ["/N · cm]					
Lost motion	Within 1μm					
Backlash	Within 1μm					
Straightness	Within 3μm					
Parallelism	Within 15μm					
Motion parallelism	Within 10μm					
Pitching/Yawing	Within 20"/15"					
Limit sensor	Installed					
Origin sensor	Installed					
Slit origin sensor	—					
Provided screw (Hexagon-headed bolt)	4 of M4—12					

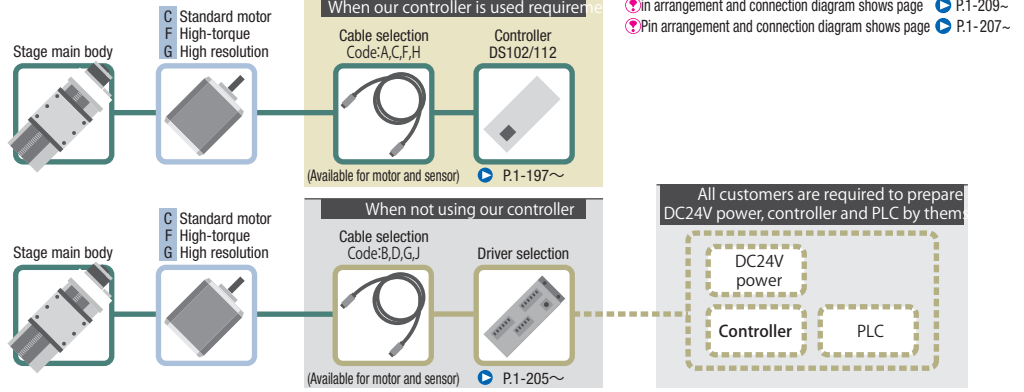
※ Might be changed specification due to motors. See page [P.1-213~](#) for details.

Motor option

**C** Standard motor  
 Motor model  
 C005C-90215P

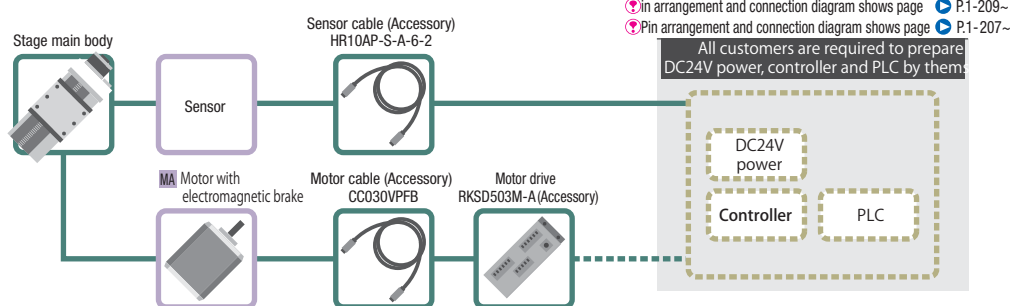
**F** High-torque  
 Motor model  
 PK525HPB-C1

**G** High resolution  
 Motor model  
 PK523HPMB-C1



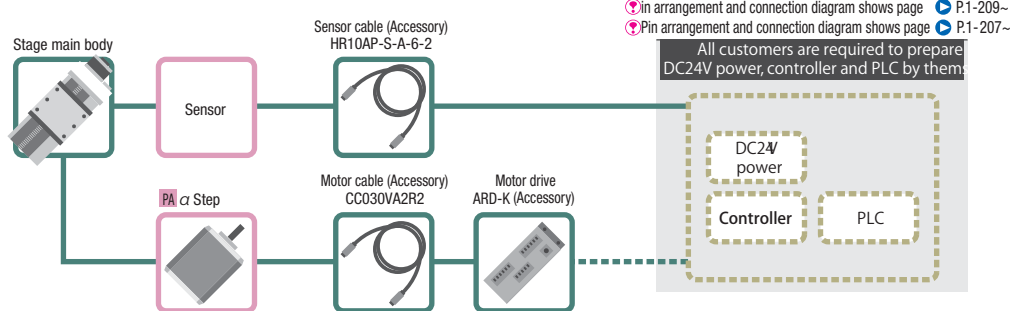
Motor option

**MA** With electromagnetic brake  
 Motor model  
 PKE545MC-A1



Motor option

**PA**  $\alpha$  Step  
 Motor model  
 ARM24SAK



Motor code		C	F	G	M	P
Feature		Standard	High-torque	High resolution	With electromagnetic brake	Small step-out
Type		5 phase stepping motor 0.75A/Phase			$\alpha$ step motor	
Model*		C005C-90215P	PK525HPB-C1	PK523HPMB-C1	PK545AWM	ASM34AK
Resolution	Lead 1mm	Full/Half	2 $\mu$ m/1 $\mu$ m		2 $\mu$ m/1 $\mu$ m	1 $\mu$ m (Set to 1000P/R)
		Micro step (1/20 split)	0.1 $\mu$ m		0.1 $\mu$ m	—
MAX speed		Lead 1mm	30mm/sec	35mm/sec	25mm/sec	40mm/sec

\* Model is our own management model.

- Motorized Stage
- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller
- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- $\phi$ 40
- $\phi$ 50
- $\phi$ 60
- $\phi$ 70
- $\phi$ 80
- $\phi$ 100
- $\phi$ 120
- Other
- 1
- 042

# Motorized Stage

CAVE-X POSITIONER

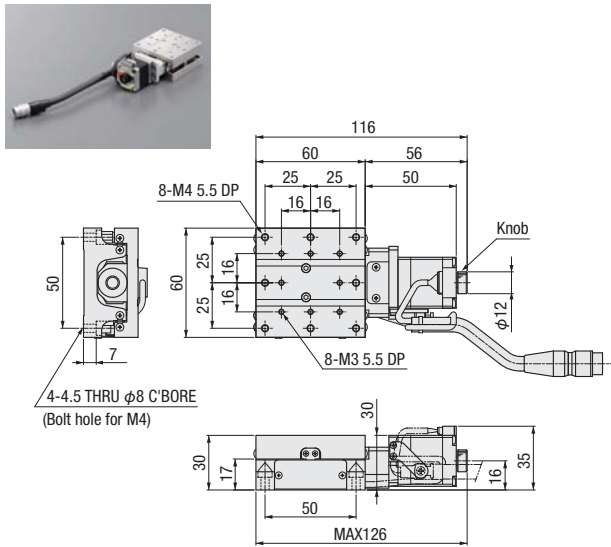
## X-axis Linear Ball Guide: KXG06020/KXG06030

Motorized Stage

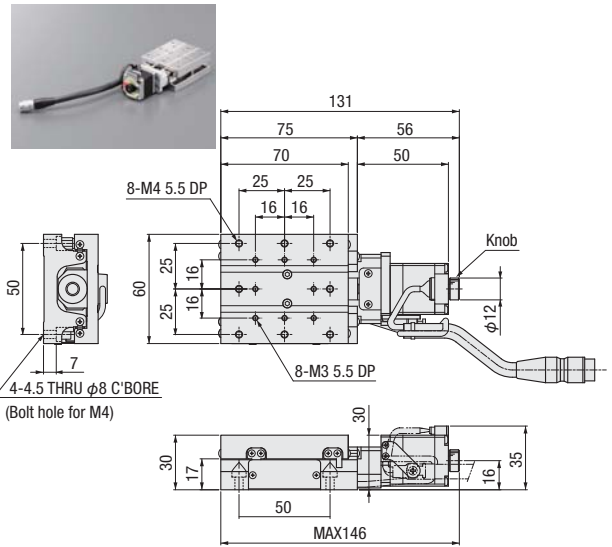
### Dimensional outline drawings

※ The photo shows an image.

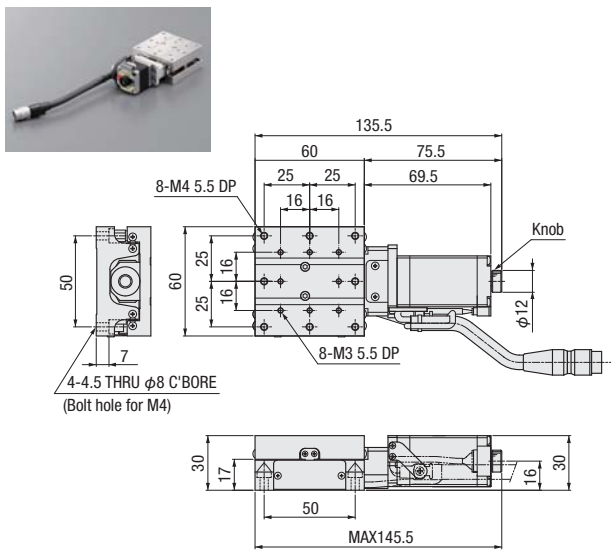
#### KXG06020-C



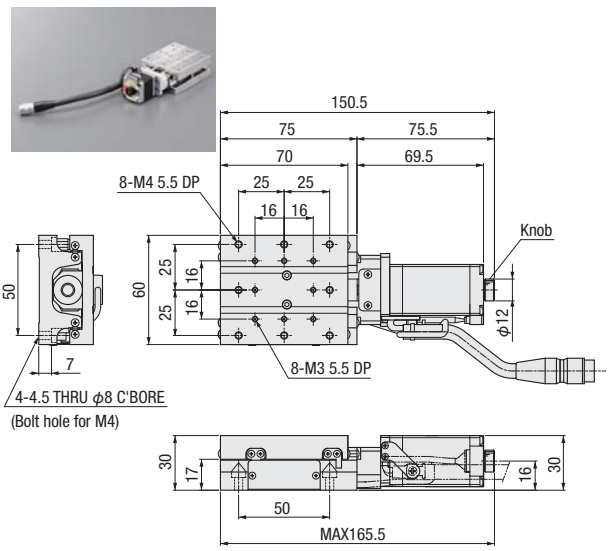
#### KXG06030-C



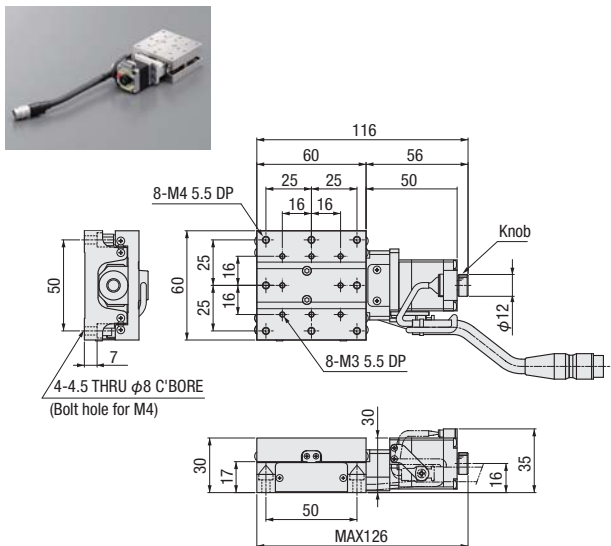
#### KXG06020-F



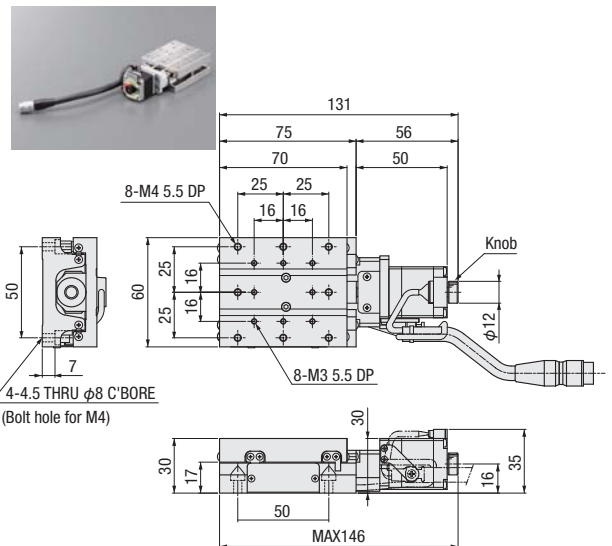
#### KXG06030-F



#### KXG06020-G



#### KXG06030-G



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other





**PART**  
COMMUNITY

CAD  
DATA



CAD  
3D·2D

Motorized Stage

X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear  
Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

044

**Dimensional outline drawings**

**C** Standard motor

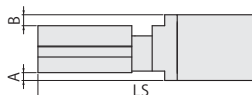
Motor model C005C-90215P

**F** High-torque

Motor model PK525HPB-C1

**G** High resolution

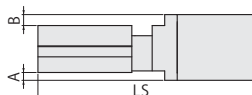
Motor model PK523HPMB-C1



Model	C (Standard) / F (High-torque) / G (High resolution) Common			C (Standard)	F (High-torque)	G (High resolution)
	Motor size	A	B	LS	LS	LS
KXG06020-□	□28	—	—	116	136	116
KXG06030-□				131	151	131

**MA** With electromagnetic brake

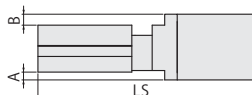
Motor model PKE545MC-A1



Model	MA (With electromagnetic brake)			C (Standard)	
	Motor size	A	B	LS	LS
KXG06020-MA	□42	5	7	164	116
KXG06030-MA				179	131

**PA** α step

Motor model ARM24SAK



Model	PA (α step)			C (Standard)	
	Motor size	A	B	LS	LS
KXG06020-PA	□28	—	—	129	116
KXG06030-PA				144	131

# Motorized Stage

CAVE-X POSITIONER

## XY-axis Linear Ball Guide: KYG06020/KYG06030

Motorized Stage

RoHS

KYG06020



KYG06030



Model Selection code Option code  
**KYG06020-C**

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-051~

### 1 Travel length

020	20mm
030	30mm

### 2 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With brake (Driver set)
PA	$\alpha$ Step (Driver set)

\* See page ▶ P.1-051~ for details of Motor option.

### 3 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for brake	—
P	Cable for $\alpha$ step	—
Blank	Cable is not included (Standard)	—

\* The price includes M, P and U.  
 Not available non-cable.  
 See page ▶ P.1-207,209~ for details of cable.  
 Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/ cable products list	Motor code	Cable code
	C,F,G MA PA	Blank, A~H,J M P

### SPEC

Model	KYG06020-C	KYG06020-F	KYG06020-G	KYG06030-C	KYG06030-F	KYG06030-G
Travel length	20mm			30mm		
Table size	60×60mm			60×70mm		
Feed screw (Ball screw)	$\phi$ 8 lead 1					
Guide	Linear ball guide					
Main materials-Finishing	Stainless—Opposite side of the end face finishing					
Weight	1.56kg	1.74kg	1.56kg	1.8kg	1.98kg	1.8kg
Resolution (Pulse)	Full/ Half	2 $\mu$ m/1 $\mu$ m		2 $\mu$ m/1 $\mu$ m		1 $\mu$ m/0.5 $\mu$ m
	Microstep	0.1 $\mu$ m (1/20 on resolution)		0.1 $\mu$ m (1/20 on resolution)		0.05 $\mu$ m (1/20 on resolution)
MAX speed	20mm/sec	30mm/sec	20mm/sec	20mm/sec	30mm/sec	20mm/sec
Load capacity	4kgf [39.2N]					
Perpendicularity	Within 10 $\mu$ m/Full stroke			Within 15 $\mu$ m/Full stroke		
Pitching/Yawing	Within 20"/15"					
Limit sensor	Installed					
Origin sensor	Installed					
Slit origin sensor	—					
Provided screw (Hexagon-headed bolt)	4 of M4—14					
Single axis accuracy specification	Uni-directional positioning accuracy	Within 5 $\mu$ m				
	Repeatability positioning accuracy	Within $\pm$ 0.5 $\mu$ m				
	Lost motion	Within 1 $\mu$ m				
	Backlash	Within 1 $\mu$ m				
Straightness	Within 3 $\mu$ m					

※ Might be changed specification due to motors. See page ▶ P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

$\phi$ 100

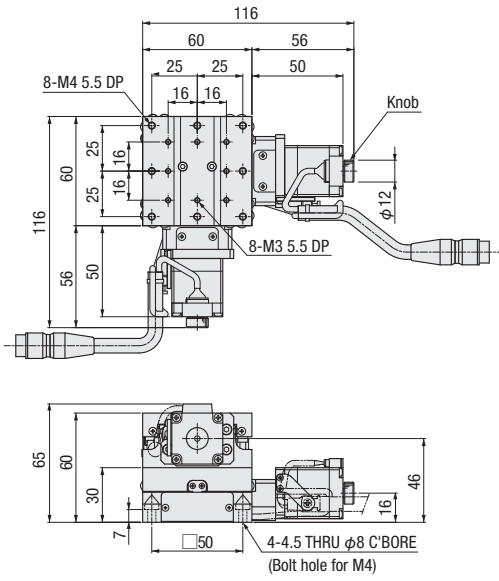
$\phi$ 120

Other

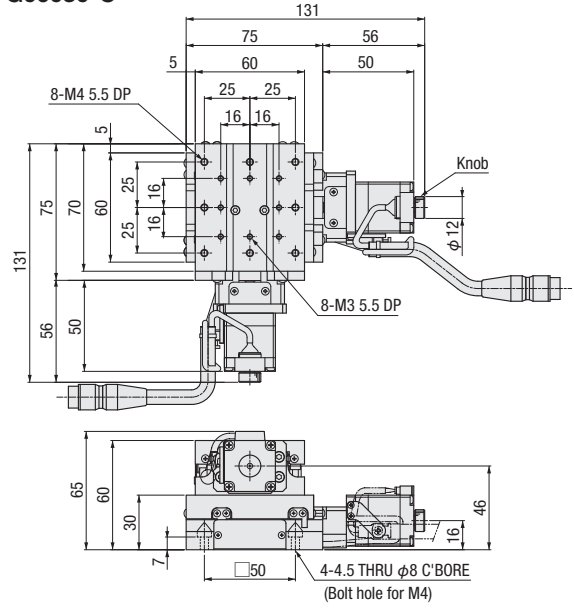
Dimensional outline drawings



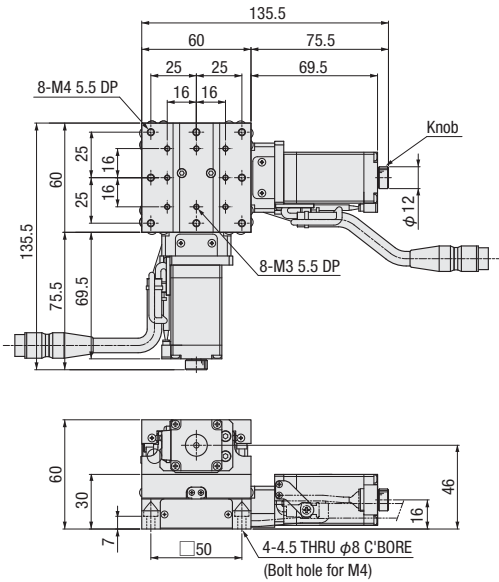
**KYG06020-C**



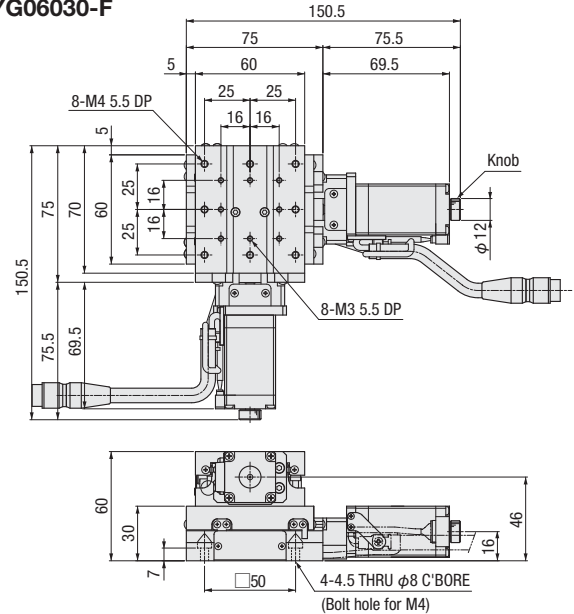
**KYG06030-C**



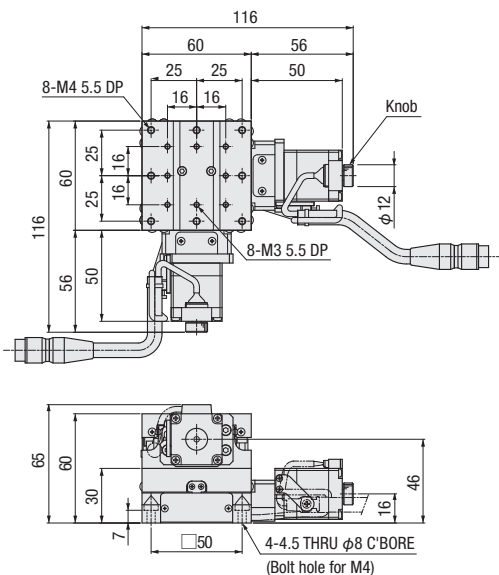
**KYG06020-F**



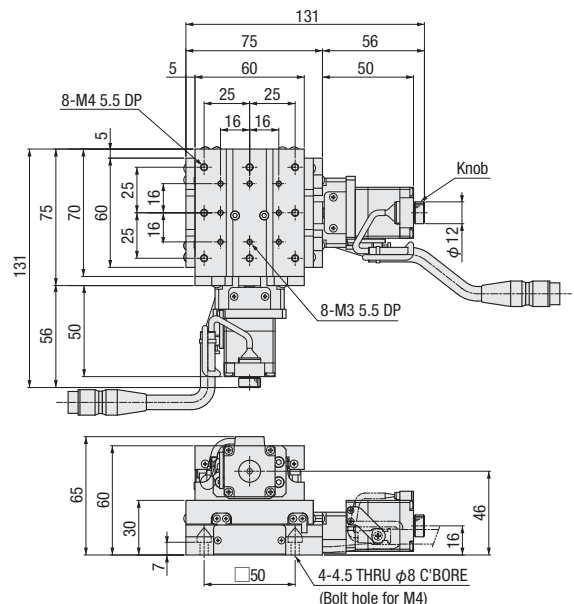
**KYG06030-F**



**KYG06020-G**



**KYG06030-G**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

046

# Motorized Stage

CAVE-X POSITIONER

## Z-axis Linear Ball Guide: KZG06020/KZG06030

Motorized Stage

KZG06020



KZG06030



RoHS



▶ Cable P.1-207~  
▶ Electrical specification P.1-051~

### 1 Travel length

020	20mm
030	30mm

### 2 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With brake (Driver set)
PA	$\alpha$ Step (Driver set)

\* See page ▶ P.1-051~ for details of motor option.

### 3 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for brake	—
P	Cable for $\alpha$ step	—
Blank	Cable is not included (Standard)	—

\* The price includes M, P and U.  
Not available non-cable.

\* See page ▶ P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	C,F,G MA PA	Blank, A~H,J M P

### SPEC

Model	KZG06020-C	KZG06020-F	KZG06020-G	KZG06030-C	KZG06030-F	KZG06030-G
Mechanical specification	Travel length		20mm	30mm		
	Table size		60×60mm		60×70mm	
	Feed screw (Ball screw)					
	Guide					
	Main materials-Finishing					
	Weight					
	1.14kg	1.23kg	1.14kg	1.26kg	1.35kg	1.26kg
Accuracy specification	Resolution (Pulse)		2 $\mu$ m/1 $\mu$ m		1 $\mu$ m/0.5 $\mu$ m	
	Full/Half Microstep		0.1 $\mu$ m (1/20 on resolution)		0.05 $\mu$ m (1/20 on resolution)	
	MAX speed		20mm/sec	30mm/sec	20mm/sec	30mm/sec
	Load capacity (Excitation)		3kgf [29.4N]			
	Vertical degree		Within 10 $\mu$ m/Full stroke		Within 15 $\mu$ m/Full stroke	
	Pitching/Yawing		Within 20"/15"			
Sensor	Limit sensor		Installed			
	Origin sensor		Installed			
	Slit origin sensor		—			
	Provided screw (Hexagon-headed bolt)		4 of M4—10			
Stage accuracy specification	Uni-directional positioning accuracy		Within 5 $\mu$ m			
	Repeatability positioning accuracy		$\pm$ 0.5 $\mu$ m			
	Lost motion		Within 1 $\mu$ m			
	Backlash		Within 1 $\mu$ m			
	Straightness		Within 3 $\mu$ m			

※ Might be changed specification due to motors. See page ▶ P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

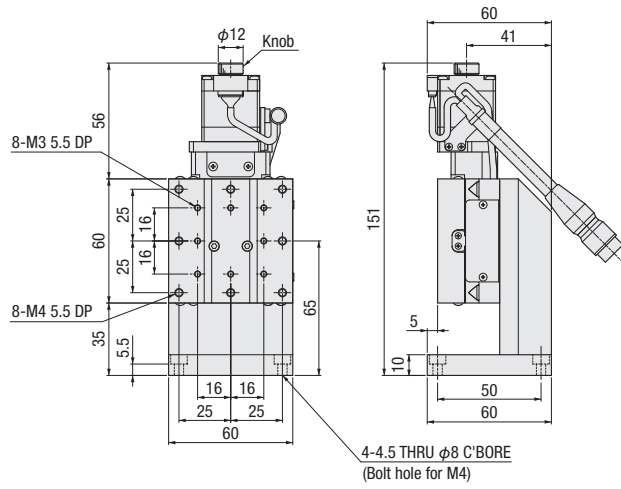
φ100

φ120

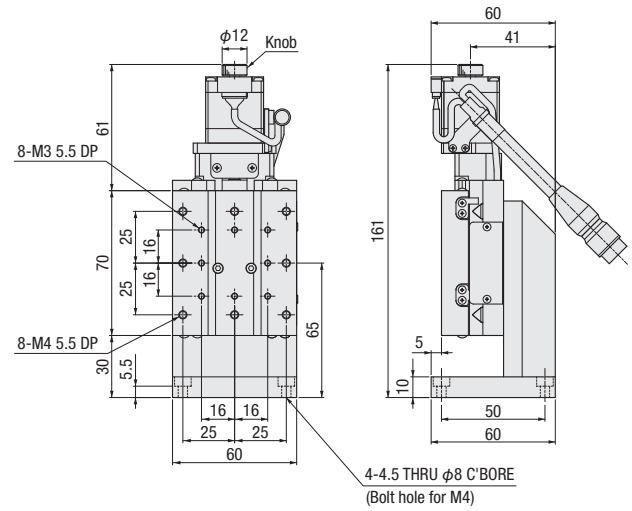
Other

**Dimensional outline drawings**

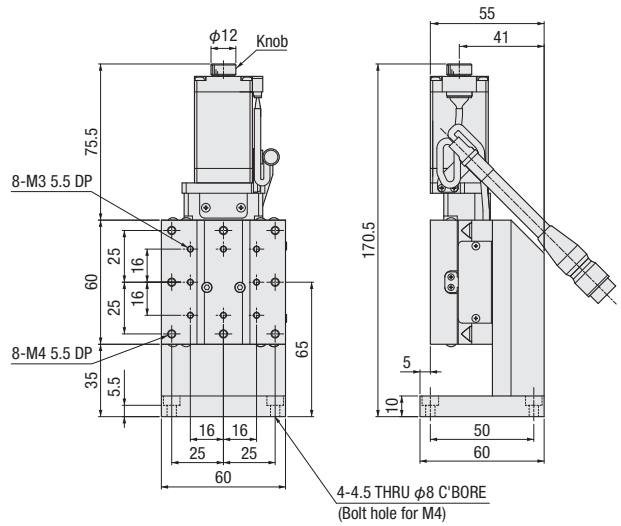
**KZG06020-C**



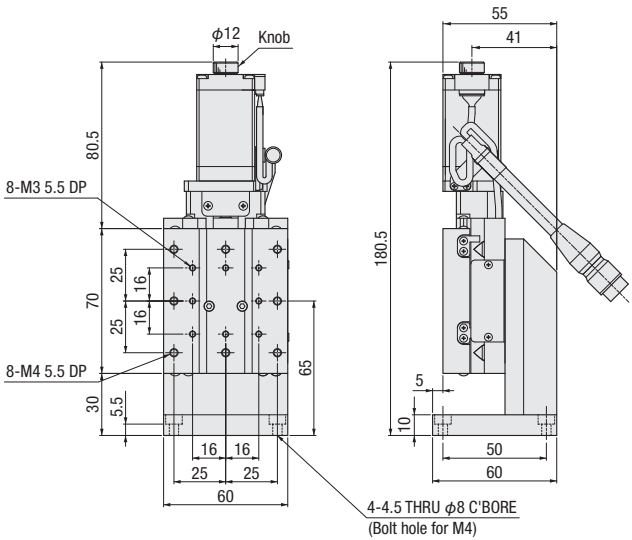
**KZG06030-C**



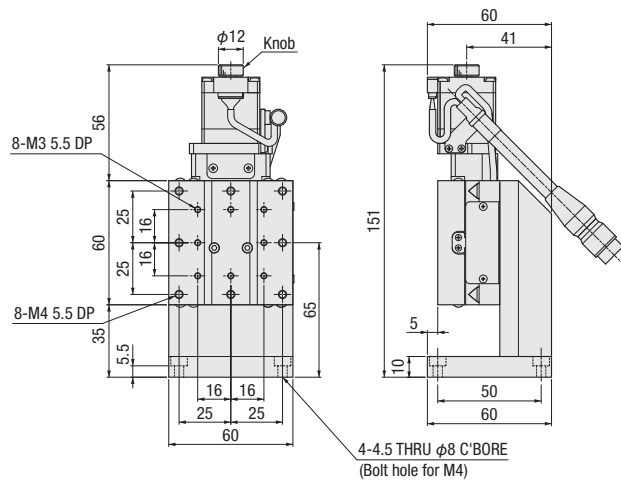
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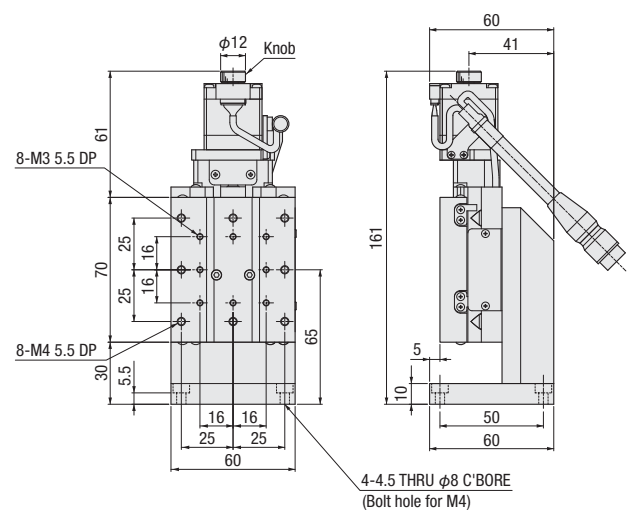
**KZG06030-F**



**KZG06020-G**



**KZG06030-G**



Motorized Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

# Motorized Stage

CAVE-X POSITIONER

## XYZ-axis Linear Ball Guide: KWG06020/KWG06030

Motorized Stage

KWG06020



KWG06030



RoHS

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Model Selection code Option code  
**KWG06 020-C**

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-051~

### 1 Travel

020	20mm
030	30mm

### 2 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With brake (Driver set)
PA	α Step (Driver set)

\* See page ▶ P.1-051~ for details of motor option.

### 3 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for α step	—
Blank	Cable is not included (Standard)	—

\* The price includes M, P and U.  
 Not available non-cable.

\* See page ▶ P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	C,F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

### SPEC

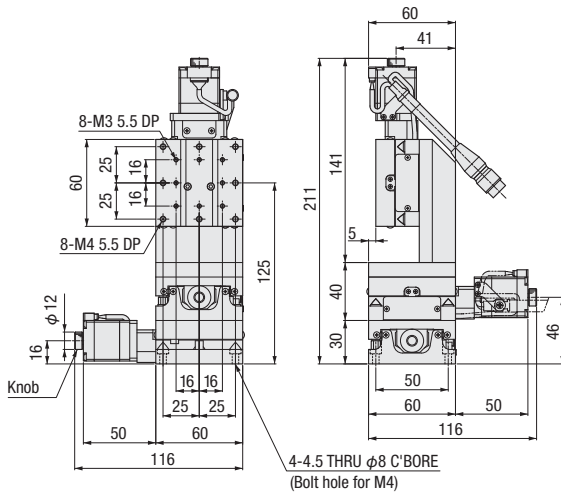
Model	KWG06020-C	KWG06020-F	KWG06020-G	KWG06030-C	KWG06030-F	KWG06030-G
Mechanical specification						
Travel length	20mm			30mm		
Table size	60×60mm			60×70mm		
Feed screw (Ball screw)	φ8 lead 1					
Guide	Linear ball guide					
Main materials-Finishing	Stainless—Opposite side of the end face finishing					
Weight	2.7kg	2.97kg	2.7kg	3.06kg	3.33kg	3.06kg
Accuracy specification	Resolution (Pulse)	2μm/1μm		2μm/1μm		1μm/0.5μm
		0.1μm (1/20 on resolution)		0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)
	MAX speed	20mm/sec	30mm/sec	20mm/sec	30mm/sec	20mm/sec
	Load capacity	3kgf [29.4N]				
	Vertical degree	Within 10μm/Full stroke			Within 15μm/Full stroke	
	Pitching/Yawing	Within 20"/15"				
Sensor	Limit sensor	Installed				
	Origin sensor	Installed				
	Slit origin sensor	—				
Provided screw (Hexagon-headed bolt)	4 of M4—12					
Shipping accuracy specification	uni-directional positioning	Within 5μm				
	Repeatability positioning	Within ±0.5μm				
	Lost motion	Within 1μm				
	Backlash	Within 1μm				
	Straightness	Within 3μm				

※ Might be changed specification due to motors. See page ▶ P.1-213 for details.

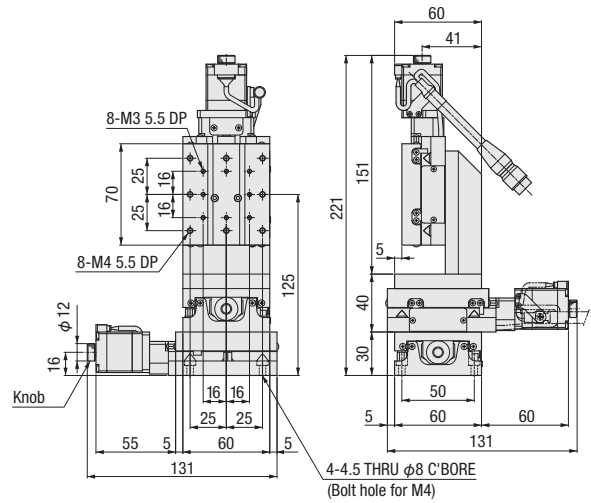
Dimensional outline drawings



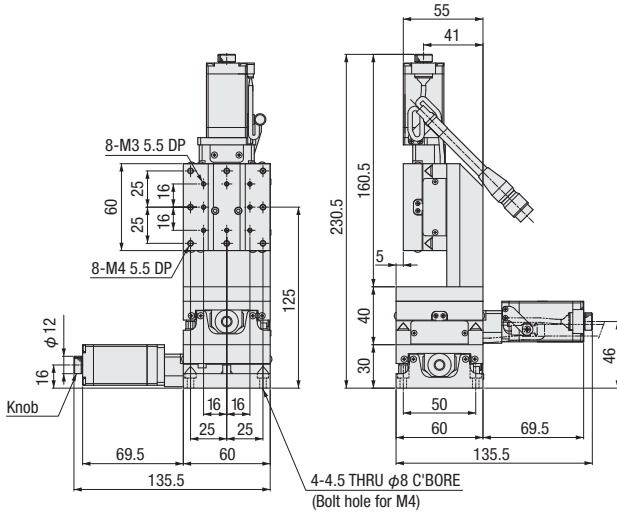
KWG06020-C



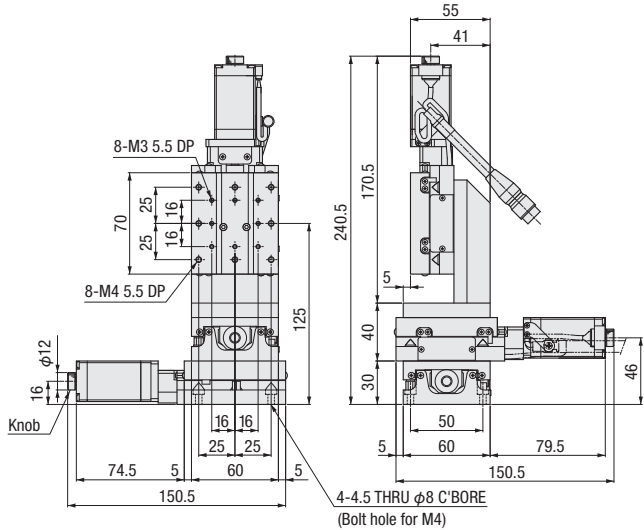
KWG06030-C



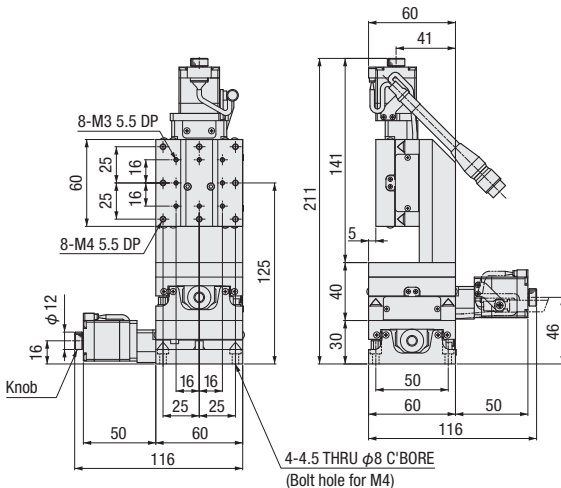
KWG06020-F



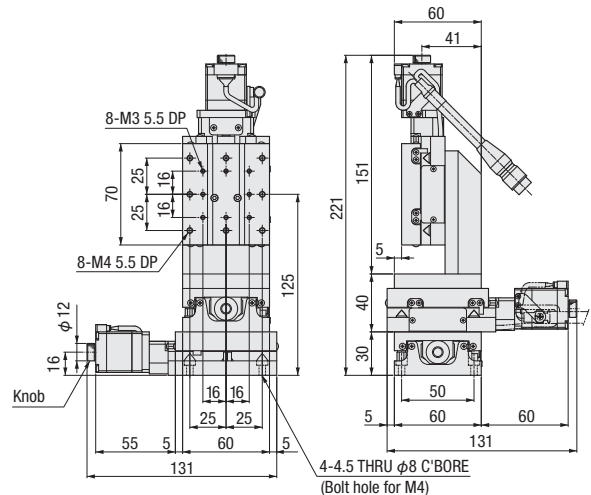
KWG06030-F



KWG06020-G



KWG06030-G



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

050

## Electrical Specification: KXG06020 / KXG06030

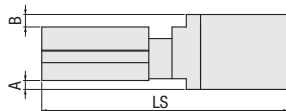
### Electrical specification

Motor code	C	F	G	MA	PA			
<b>Models</b>	<b>KXG06020 / KXG06030</b>							
Motor Specification (*1)	Type	5 phase stepping motor 0.75A/Phase			α step motor			
	Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out		
	Model (*2)	C005C-90215P	PK525HPB-C1	PK523HPMB-C1	PKE545MC-A1	ARM24SAK		
	Brake	N/A			Installed	N/A		
	Maker	Oriental Motor Co.,Ltd.						
	Step angle (Position detector)	0.72°	0.72°	0.36°	0.72°	0.36° (Set to 1000P/R)		
	Mass	0.11kg	0.2kg	0.11kg	0.52kg	0.15kg		
	Motor size	□ size	28mm	28mm	28mm	42mm	28mm	
		L size	42mm	61.5mm	42mm	69mm	45mm	
	Excitation (moment) maximum torque	0.041N · m	0.073N · m	0.038N · m	0.240N · m	0.055N · m		
Driver type	CRD5107P Oriental Motor Co.,Ltd.			RKSD503M-A	ARD-K			
Input power (Voltage · frequency)	DC24V ±10%			Single phase AC100-115V 50/60Hz	DC24V±10%			
Sensor	Limit sensor	Installed						
	Origin sensor	Installed						
	Slit origin sensor	-						
	Model	EE-SX4134 (Omron Co.,Ltd.)						
	Power voltage	DC5~24V ±10%						
	Consumption current	Total 60mA or less						
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA						
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)							
Connector	Motor	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		350782-1 (Tyco Electronics Japan G.K.)	5557-10R (Japan Molex)		
		Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		350720-1 (Tyco Electronics Japan G.K.)	5559-10P (Japan Molex)		
	Sensor	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)※In common with a motor		HR10A-7J-6P (73) (Hirose Electric Co.,Ltd.)			
		Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)※In common with a motor		HR10A-7P-6S (73) (Hirose Electric Co.,Ltd.)			
Accuracy specification	Resolution	Lead 1mm	Full/ Half	2μm/1μm	2μm/1μm	1μm/0.5μm	2μm/1μm	1μm(Set to 1000P/R)
		Micro step (1/20 split)	0.1μm	0.1μm	0.05μm	0.1μm	-	
	MAX speed	Lead 1mm	30mm/sec	35mm/sec	25mm/sec	25mm/sec	40mm/sec	

\*1 See page P.1-213~ for details of single motor specification. \*2 Model is our own management model. \* The electric specification of XY (PMG), Z (PZG), XYZ (PMZG) are the same.

### The diameter outside drawings

#### KXG series



Motor code	Size □ [mm]	A	B	LS	
				20	30
C	28	-	0	116	131
F	28	-	0	136	151
G	28	-	0	116	131
MA	42	5	7	166	181
PA	28	-	0	129	144

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other



Pin allocation • Connection diagram

Motor code	KXG series																																									
C.F.G	Available for motor and sensor																																									
	<p>[Motor and sensor pin allocation (the same)]</p> <p>[Motor and sensor connection diagram (the same)]</p> <p>1 Motor lead (Blue)    Blue                  2 Motor lead (Red)    Red                  3 Motor lead (Orange)    Orange                  4 Motor lead (Green)    Green                  5 Motor lead (Black)    Black                  6 CWLS output                  7 CCWLS output                  8 Open                  9 Power input (+)                  10 ORG output                  11 Power input (-)                  12 F.G.</p> <p>* Please select other side cable from the cable option.</p>																																									
MA	Motor	<p>[Pin allocation (motor)]</p> <p>[Connector diagram (motor)]</p> <p>1 Motor lead (Blue)    Blue                  2 Motor lead (Red)    Red                  3 Motor lead (Orange)    Orange                  4 Motor lead (Green)    Green                  5 Motor lead (Black)    Black                  6 Open                  7 Open                  8 Power input (+)                  9 Power input (-)</p> <p>* Model number of other side cable: CC030VPPFB See page P.1-211 for details.</p> <p>Driver-side crimp terminal 0.5-3                  VCTF23NX-0.5-8 (Kuramo Electric Co.,Ltd.)                  ULAWM2517 AWG20                  Motor-end connector 350720-1 (Tyco Electronics Japan G.K.)</p> <p>3m +50mm -0mm</p> <table border="1"> <thead> <tr> <th>Mark</th> <th>Color</th> <th>Pin</th> <th>Signals</th> </tr> </thead> <tbody> <tr> <td>BLUE</td> <td>Blue</td> <td>1</td> <td>Motor lead Blue</td> </tr> <tr> <td>RED</td> <td>Red</td> <td>2</td> <td>Motor lead Red</td> </tr> <tr> <td>ORANGE</td> <td>Yellow</td> <td>3</td> <td>Motor lead Orange</td> </tr> <tr> <td>GREEN</td> <td>Green</td> <td>4</td> <td>Motor lead Green</td> </tr> <tr> <td>BLACK</td> <td>Black</td> <td>5</td> <td>Motor lead Black</td> </tr> <tr> <td>+M.BRAKE</td> <td>Brown</td> <td>8</td> <td>Motor brake (+)</td> </tr> <tr> <td>-M.BRAKE</td> <td>White</td> <td>9</td> <td>Motor brake (-)</td> </tr> </tbody> </table>	Mark	Color	Pin	Signals	BLUE	Blue	1	Motor lead Blue	RED	Red	2	Motor lead Red	ORANGE	Yellow	3	Motor lead Orange	GREEN	Green	4	Motor lead Green	BLACK	Black	5	Motor lead Black	+M.BRAKE	Brown	8	Motor brake (+)	-M.BRAKE	White	9	Motor brake (-)								
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Sensor	<p>[Pin allocation (Sensor)]</p> <p>[Connector diagram (Sensor)]</p> <p>1 CWLS output                  2 CCWLS output                  3 ORG output                  4 NORG output                  5 Power input (+)                  6 Power input (-)</p> <p>* Model number of other side cable: HR10AP-S-A-6-2 See page P.1-212 for details.</p> <p>ULAWM20276 AWG28 3P Navy                  Sensor side Connector (Female): HR10A-7P-6S (73) (Hirose Electric Co.,Ltd.)</p> <p>2m +50mm -0mm</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Shield</th> <th>Signals</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Orange / Black</td> <td>CWLS</td> </tr> <tr> <td>2</td> <td>Orange / Red</td> <td>CCWLS</td> </tr> <tr> <td>3</td> <td>Gray / Black</td> <td>ORG</td> </tr> <tr> <td>4</td> <td>Gray / Red</td> <td>NORG</td> </tr> <tr> <td>5</td> <td>White / Black</td> <td>V+</td> </tr> <tr> <td>6</td> <td>White / Red</td> <td>V-</td> </tr> <tr> <td></td> <td>Shield</td> <td></td> </tr> </tbody> </table> <p>* The shields are connected with the connector shell.</p>	Pin	Shield	Signals	1	Orange / Black	CWLS	2	Orange / Red	CCWLS	3	Gray / Black	ORG	4	Gray / Red	NORG	5	White / Black	V+	6	White / Red	V-		Shield																		
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Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

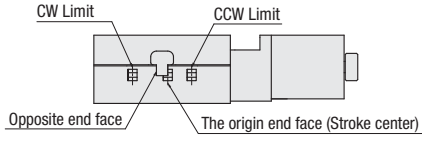
# Motorized Stage

## Electrical Specification: KXG06020/KXG06030

Motorized Stage

### Timing chart

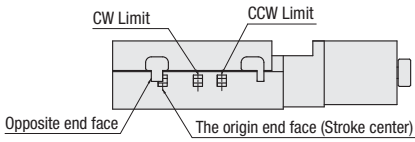
#### KXG06020



Mechanical stopper

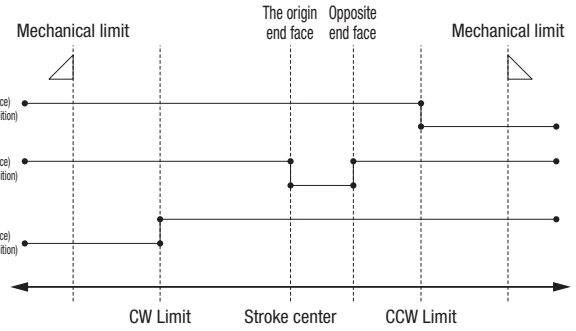
CCW Limit

#### KXG06030



CW Limit

Proximity origin sensor



Unit [mm]

Direction of CW ←

→ Direction of CCW

	Reference coordinate	Mechanical limit	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit	Mechanical limit
<b>KXG06020</b>	Return to origin	11	10.5	0	5	10.5	13
<b>KXG06030</b>	Return to origin	16	15.5	0	5	15.5	18

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.

Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

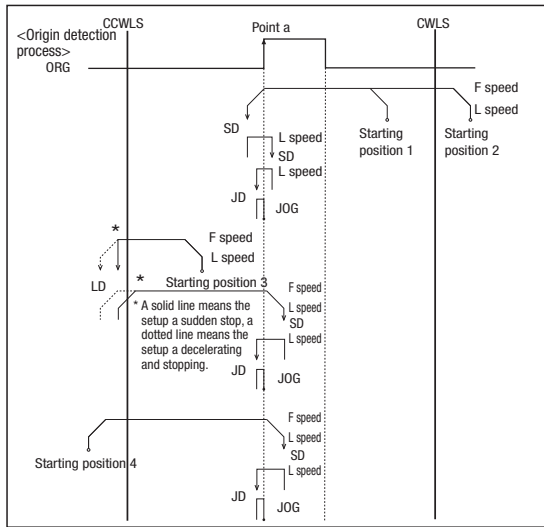
**Return to origin method**

Suruga's motorized stages is different from the wire connection as the number of sensors depending on models. It is necessary to choose type to suit correctly as return to origin operation is divided into same types. Selected wrong type may be operated incorrectly. Choose your best one whatever you need according to be recommended as below.

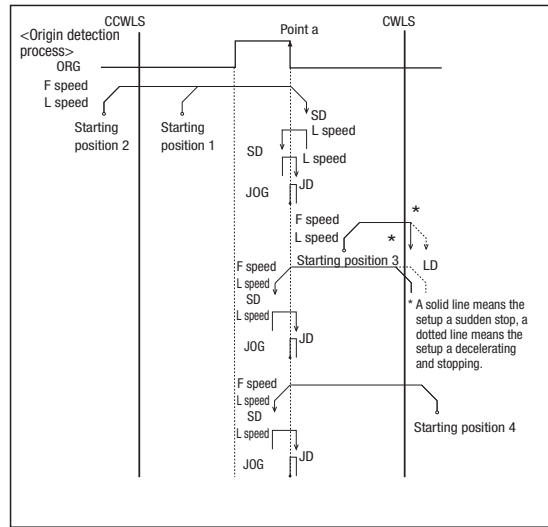
**KXG06020/KXG06030 recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

[Type3]



[Type4]



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

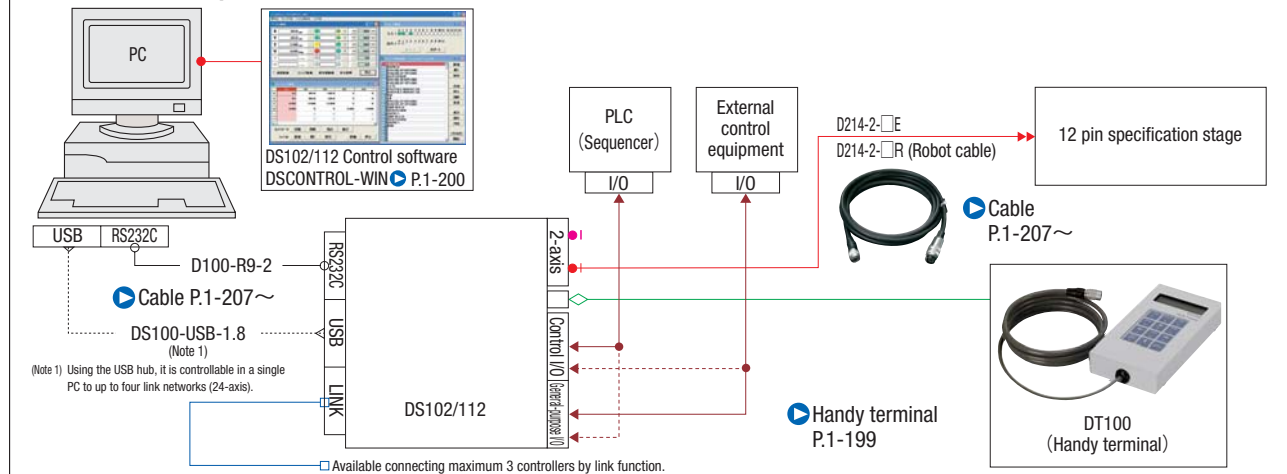
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102N	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connectin example**



(Note 1) Using the USB hub, it is controllable in a single PC to up to four link networks (24-axis).

Available connecting maximum 3 controllers by link function.

# Motorized Stage

CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06030/KXL06050/KXL06075

Motorized Stage

KXL06030-N



KXL06050-N



KXL06075-N



KXL06030-C



KXL06050-C



KXL06075-C



See page P009

The drive unit areas are coated in clean grease.

Model Selection code Option code

**KXL06 030-N1-C**

1 2 3 4 5 6

Cable P.1-207~  
Electrical specification P.1-077~

### 1 Travel length

030	30mm
050	50mm
075	75mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

### 4 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

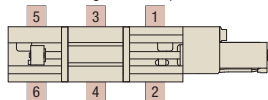
\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.

Position of origin sensor option (Please choose one position)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.  
Not available non-cable.

\* See page P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	C,F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

$\phi$ 100

$\phi$ 120

Other

### SPEC

Model	Uncovered	KXL06030-N1-C	KXL06030-N2-C	KXL06050-N1-C	KXL06050-N2-C	KXL06075-N1-C	KXL06075-N2-C	
	Covered	KXL06030-C1-C	KXL06030-C2-C	KXL06050-C1-C	KXL06050-C2-C	KXL06075-C1-C	KXL06075-C2-C	
Mechanical specification	Travel length	30mm		50mm		75mm		
	Table size	60×60mm						
	Feed screw (Ball screw)	$\phi$ 8 lead 1	$\phi$ 8 lead 2	$\phi$ 8 lead 1	$\phi$ 8 lead 2	$\phi$ 8 lead 1	$\phi$ 8 lead 2	
	Guide	Linear ball guide						
Main materials-Finishing	Stainless—Opposite side of the end face finishing							
	Weight	Uncovered	1.28kg	1.40kg		1.54kg		
		Covered	1.34kg	1.44kg		1.60kg		
Accuracy specification	Resolution (Pulse)	Full/Half	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m
		Microstep	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)
	MAX speed	30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec	
	Uni-directional positioning accuracy	Within 5 $\mu$ m				Within 7 $\mu$ m		
	Repeatability positioning accuracy	Within $\pm$ 0.5 $\mu$ m						
	Load capacity	12kgf [117.6N]						
	Moment stiffness	Pitch 0.05/yaw 0.05/roll 0.05 ["/N · cm]						
	Lost motion	Within 1 $\mu$ m						
	Backlash	Within 1 $\mu$ m						
	Straightness	Within 3 $\mu$ m						
Sensor	Parallelism	Within 15 $\mu$ m						
	Motion parallelism	Within 10 $\mu$ m						
	Pitching/Yawing	2Within 0"/Within 15"						
	Limit sensor	Installed						
Origin sensor	— ※Attachable in the origin sensor option							
Slit origin sensor	—							
Provided screw (Hexagon-headed bolt)	8 of M4—14							

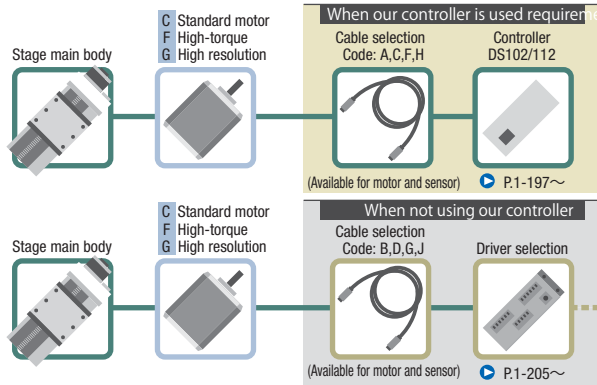
※ Might be changed specification due to motors. See page P.1-213~ for details.

Motor option

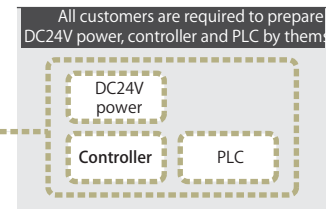
**C** Standard motor  
 Motor model C005C-90215P

**F** High-torque  
 Motor model PK525HPB-C1

**G** High resolution  
 Motor model PK523HPMB-C1

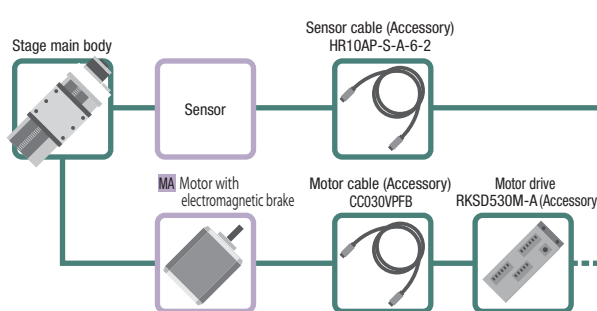


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

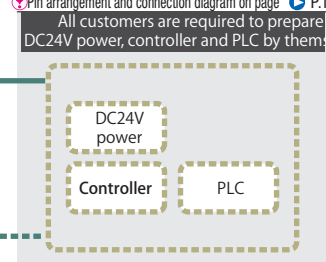


Motor option

**MA** With electromagnetic brake  
 Motor model PKE545MC-A1

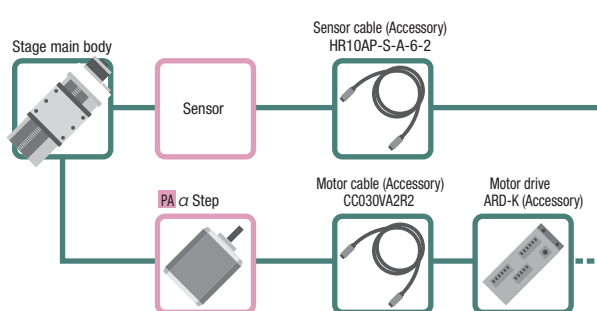


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

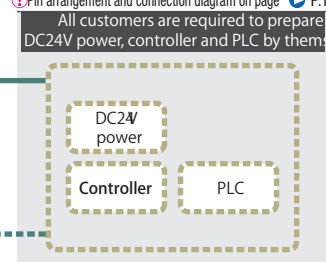


Motor option

**PA** α Step  
 Motor model ARM24SAK

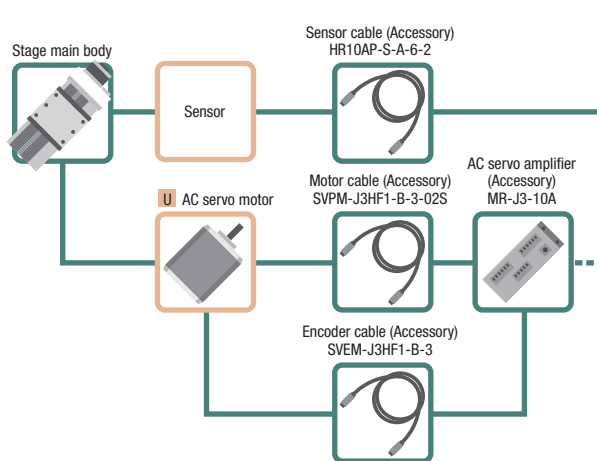


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

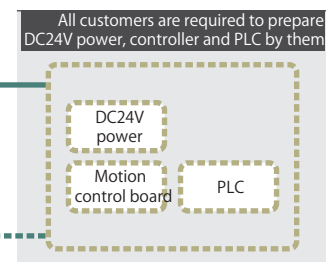


Motor option

**U** AC servo motor  
 Motor model HF-KP053



Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~



Motor code	C	F	G	MA	PA	U	
Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed	
Type	5 phase stepping motor 0.75A/ Phase				α step motor	AC servo motor	
Motor model*	C005C-90215P	PK525HPB-C1	PK523HPMB-C1	PKE545MC-A1	ARM24SAK	HF-KP053	
Resolution	Lead 1mm	Full/ Half	2μm/1μm	1μm/0.5μm	2μm/1μm	1μm(Set to 1000P/R)	18 bits encoder (262144P/R)
		Micro step (1/20 split)	0.1μm	0.05μm	0.1μm	—	
	Lead 2mm	Full/ Half	4μm/2μm	2μm/1μm	4μm/2μm	2μm(Set to 1000P/R)	
		Micro step (1/20 split)	0.2μm	0.1μm	0.2μm	—	
Max. speed	Lead 1mm	30mm/sec	35mm/sec	25mm/sec	25mm/sec	40mm/sec	50mm/sec
	Lead 2mm	35mm/sec	45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec

\* Model is our own management model.

# Motorized Stage

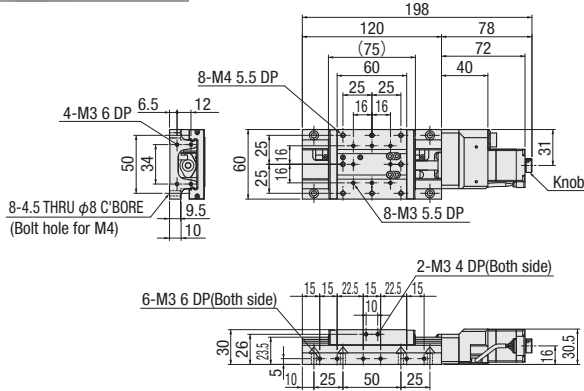
CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06030/KXL06050/KXL06075

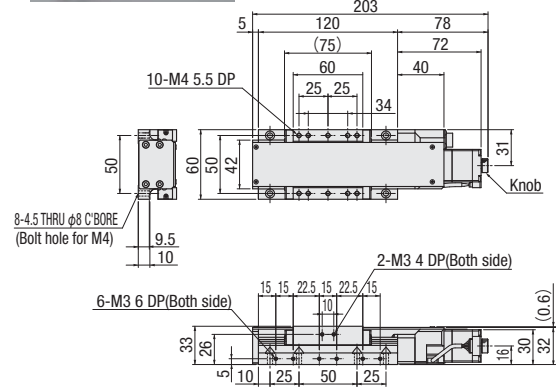
Motorized Stage

### Dimensional outline drawings

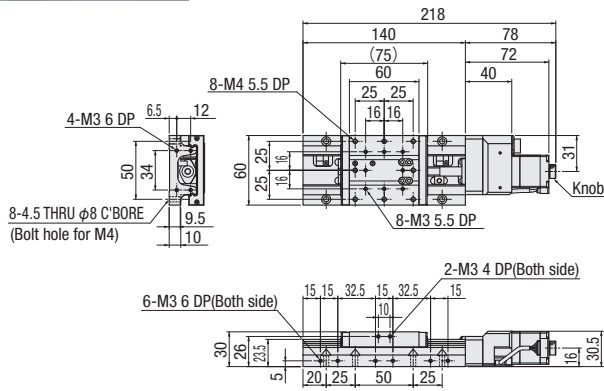
**KXL06030-N1-C (KXL06030-N2-C)**



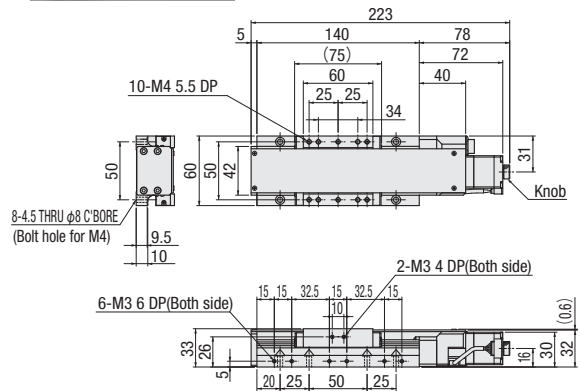
**KXL06030-C1-C (KXL06030-C2-C)**



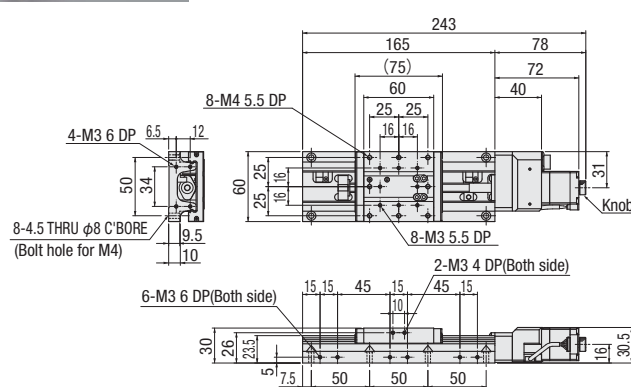
**KXL06050-N1-C (KXL06050-N2-C)**



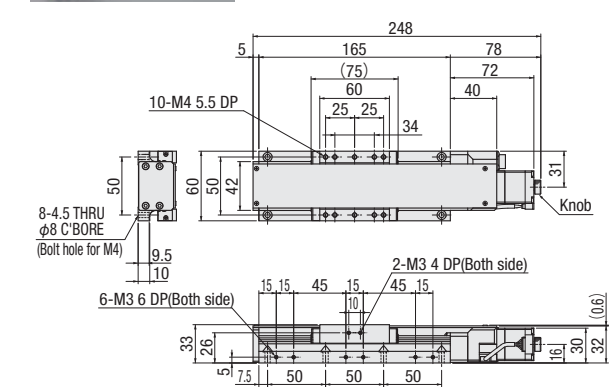
**KXL06050-C1-C (KXL06050-C2-C)**



**KXL06075-N1-C (KXL06075-N2-C)**



**KXL06075-C1-C (KXL06075-C2-C)**



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other



Dimensional outline drawings

**C** Standard

Motor model C005C-90215P

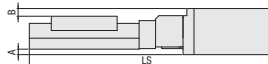
**F** High-torque

Motor model PK525HPB-C1

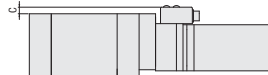
**G** High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

Model	C (Standard) / F (High-torque) / G (High resolution) Common				C (Standard)	F (High-torque) LS	G (High resolution)
	Motor size	A	B	C			
KXL06030-N□-C,F,G	□28	—	0.5	—	198	218	198
KXL06050-N□-C,F,G					218	238	218
KXL06075-N□-C,F,G					243	263	243

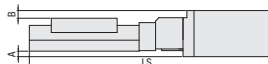
Covered

Model	C (Standard) / F (High-torque) / G (High resolution) Common				C (Standard)	F (High-torque) LS	G (High resolution)
	Motor size	A	B	C			
KXL06030-C□-C,F,G	□28	—	—	—	203	223	203
KXL06050-C□-C,F,G					223	243	223
KXL06075-C□-C,F,G					248	268	248

**MA** With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

Model	MA (With electromagnetic brake)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-N□-M	□42	5	7	6	245	198
KXL06050-N□-M					265	218
KXL06075-N□-M					290	243

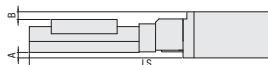
Covered

Model	MA (With electromagnetic brake)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-C□-M	□42	5	4	6	250	203
KXL06050-C□-M					270	223
KXL06075-C□-M					295	248

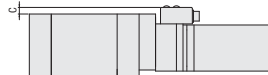
**PA** α step

Motor model ARM24SAK

Side view



Top view



Uncovered

Model	PA (α step)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-N□-P	□28	—	0.5	6	211	198
KXL06050-N□-P					231	218
KXL06075-N□-P					256	243

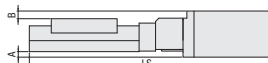
Covered

Model	PA (α step)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-C□-P	□28	—	—	6	216	203
KXL06050-C□-P					236	223
KXL06075-C□-P					261	248

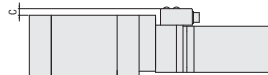
**U** AC servo motor

Motor model HF-KP053

Side view



Top view



Uncovered

Model	U (AC servo motor)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-N□-U	□40	4.7	6.5	6	240	198
KXL06050-N□-U					260	218
KXL06075-N□-U					285	243

Covered

Model	U (AC servo motor)				C (Standard)	
	Motor size	A	B	C	LS	
KXL06030-C□-U	□40	4.7	3.5	6	245	203
KXL06050-C□-U					265	223
KXL06075-C□-U					290	248

# Motorized Stage

CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06100/KXL06150

Motorized Stage

KXL06100-N



KXL06150-N



KXL06100-C



KXL06150-C



Freely customize the motor

RoHS

See page P.009

Model Selection code Option code

**KXL06** **100-N2-F**

1 2 3 4 5 6

Cable P.1-207~  
Electrical specification P.1-077~

### 1 Travel length

100	100mm
150	150mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

2	Lead 2mm
---	----------

### 4 Motor option

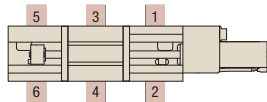
Code	Specification
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.  
■ Position of origin sensor option (Please choose one position )



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Without cable	—

\* One end loose position to only stage opposite side.  
\* The price includes M, P and U.  
Not available non-cable.  
\* See page P.1-207,209~ for details of cable.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor / cable products list	Motor code	Cable code
	F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

## SPEC

Model	Uncovered	KXL06100-N2-F	KXL06150-N2-F
	Covered	KXL06100-C2-F	KXL06150-C2-F
Mechanical specification	Travel length	100mm	150mm
	Table size	60×60mm	
	Feed screw (Ball screw)	φ8 lead 2	
	Guide	Linear ball guide	
Main materials-Finishing	Stainless—Opposite side of the end face finishing		
	Weight	Uncovered 1.80kg Covered 1.86kg	2.10kg 2.16kg
Accuracy specification	Resolution (Pulse)	4μm/2μm	
		0.2μm (1/20 on resolution)	
	MAX speed	45mm/sec	
	Uni-directional positioning accuracy	Within 10μm	Within 15μm
	Repeatability positioning accuracy	Within ±0.5μm	
	Load capacity	12kgf [117.6N]	
	Moment stiffness	Pitch 0.05/yaw 0.05/roll 0.05 ["/N · cm]	
	Lost motion	Within 1μm	
	Backlash	1Within μm	
	Straightness	Within 5μm	
Sensor	Parallelism	Within 15μm	
	Motion parallelism	Within 10μm	Within 15μm
	Pitching/Yawing	Within 25"/Within 20"	
	Limit sensor	Installed	
Origin sensor	— ※Attachable in origin sensor option		
Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)	8 of M4—14		14 of M4—14

※ Might be changed specification due to motors. See page P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

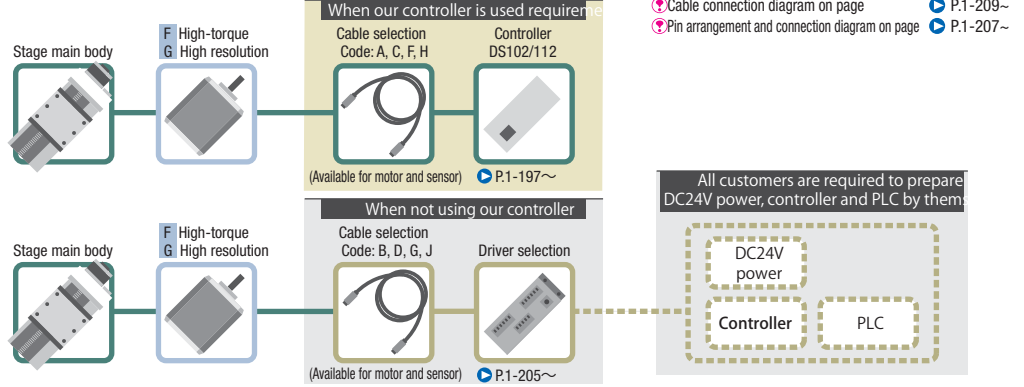
Other



Motor option

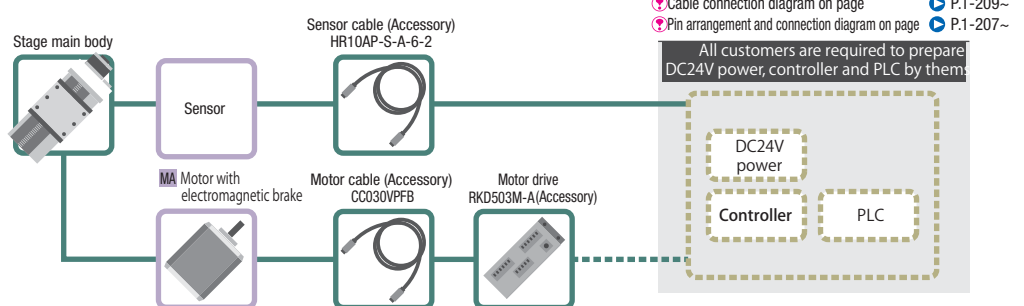
**F** High-torque  
 Motor model  
 PK525HPB-C1

**G** High resolution  
 Motor model  
 PK523HPMB-C1



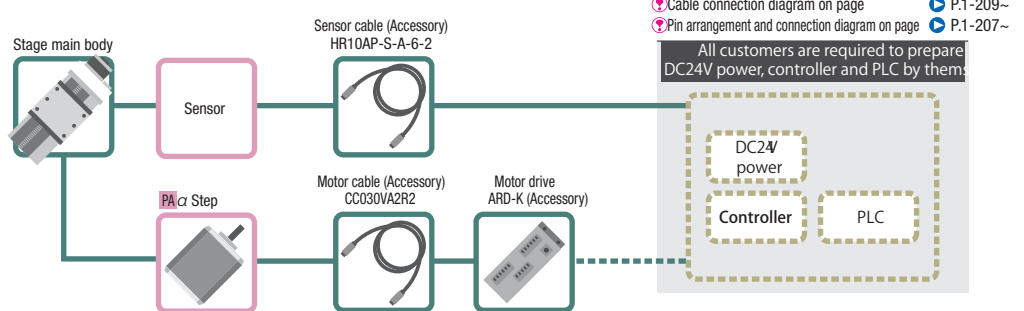
Motor option

**MA** With electromagnetic brake  
 Motor model  
 PKE545MC-A1



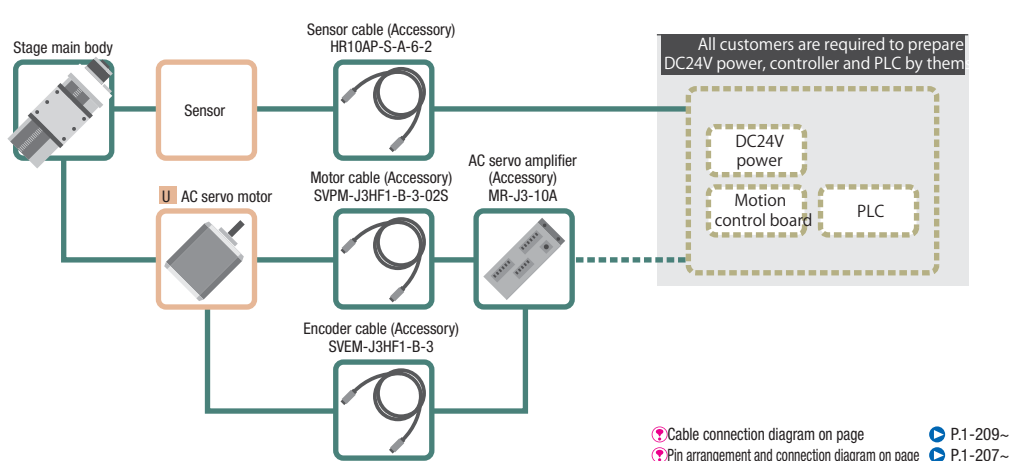
Motor option

**PA**  $\alpha$  Step  
 Motor model  
 ARM24SAK



Motor option

**U** AC servo motor  
 Motor model  
 HF-KP053



Motor code	F	G	MA	PA	U
Feature	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type	5 phase stepping motor 0.75A/ Phase			$\alpha$ step motor	AC servo motor
Motor model*	PK525HPB-C1	PK523HPMB-C1	PKE545MC-A1	ARM24SAK	HF-KP053
Resolution	Lead 2mm	Full/ Half	4 $\mu$ m/2 $\mu$ m	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m
		Micro step (1/20 split)	0.2 $\mu$ m	0.1 $\mu$ m	0.2 $\mu$ m
MAX speed	Lead 2mm	45mm/sec	30mm/sec	40mm/sec	80mm/sec

\* Model is our own management model.

- Motorized Stage
- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller
- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- $\phi$ 40
- $\phi$ 50
- $\phi$ 60
- $\phi$ 70
- $\phi$ 80
- $\phi$ 100
- $\phi$ 120
- Other
- 1
- 060

# Motorized Stage

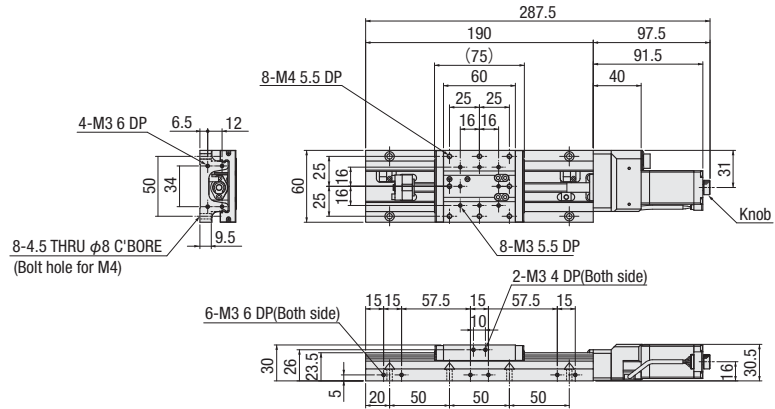
CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06100/KXL06150

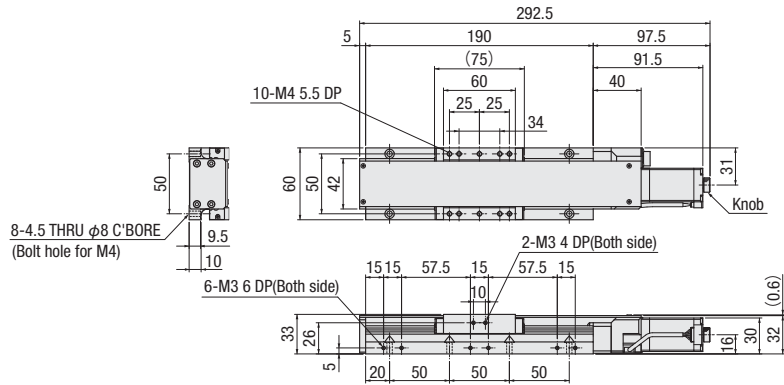
Motorized Stage

### Dimensional outline drawings

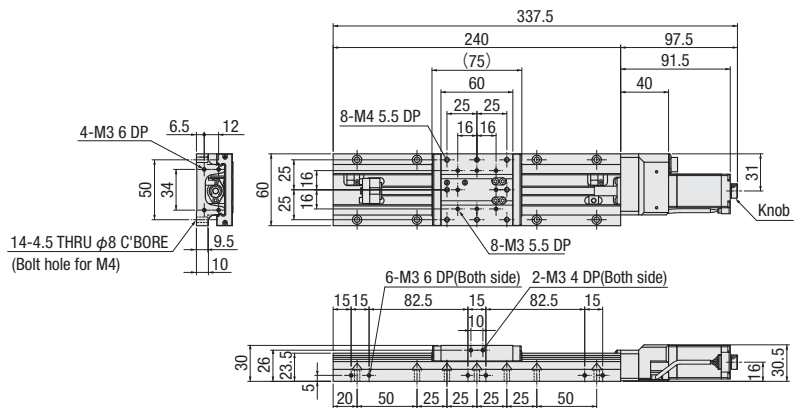
#### KXL06100-N2-F



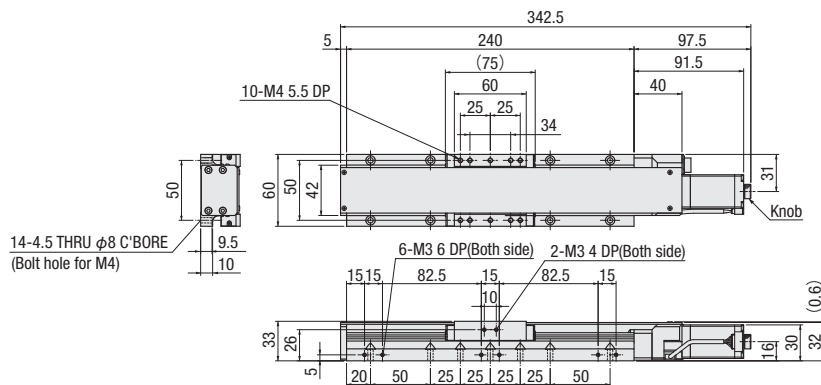
#### KXL06100-C2-F



#### KXL06150-N2-F



#### KXL06150-C2-F



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

Dimensional outline drawings

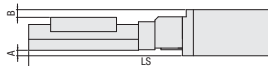
**F** High-torque

Motor model PK525HPB-C1

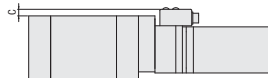
**G** High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

Model	F (High-torque) / G (High resolution) Common				F (High-torque)	G (High resolution)
	Motor size	A	B	C	LS	
KXL06100-N2-F,G	□28	—	0.5	—	288	268
KXL06150-N2-F,G					338	318

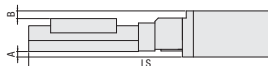
Covered

Model	F (High-torque) / G (High resolution) Common				F (High-torque)	G (High resolution)
	Motor size	A	B	C	LS	
KXL06100-C2-F,G	□28	—	—	—	293	273
KXL06150-C2-F,G					343	323

**MA** With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

Model	MA (With electromagnetic brake)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-N2-M	□42	5	7	6	315	288
KXL06150-N2-M					365	338

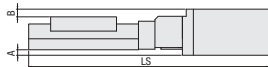
Covered

Model	MA (With electromagnetic brake)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-C2-M	□42	5	4	6	320	293
KXL06150-C2-M					370	343

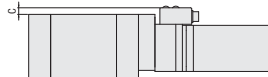
**P** α step

Motor model A

Side view



Top view



Uncovered

Model	PA (α step)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-N2-P	□28	—	0.5	6	281	288
KXL06150-N2-P					331	338

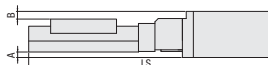
Covered

Model	PA (α step)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-C2-P	□28	—	—	6	286	293
KXL06150-C2-P					336	343

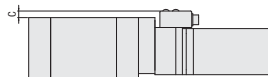
**U** AC servo motor

Motor model HF-KP053

Side view



Top view



Uncovered

Model	U (AC servo motor)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-N2-U	□40	4.7	6.5	6	310	288
KXL06150-N2-U					360	338

Covered

Model	U (AC servo motor)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06100-C2-U	□40	4.7	3.5	6	315	293
KXL06150-C2-U					365	343

# Motorized Stage

CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06200/KXL06300

Motorized Stage

KXL06200-N



KXL06300-N



KXL06200-C



KXL06300-C



Freely customize the motor

RoHS

See page P.009

Model Selection code Option code

**KXL06 200-N2-F**    

1 2 3 4 5 6

Cable P.1-207~  
Electrical specification P.1-077~

### 1 Travel length

200	200mm
300	300mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

2	Lead 2mm
---	----------

### 4 Motor option

Code	Specification
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

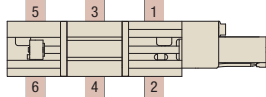
\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.

Position of origin sensor option (Please choose one position)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.  
Not available non-cable.

\* See page P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

## SPEC

Model	Uncovered	KXL06200-N2-F	KXL06300-N2-F	
	Covered	KXL06200-C2-F	KXL06300-C2-F	
Mechanical specification	Travel length	200mm	300mm	
	Table size	60×60mm		
	Feed screw (Ball screw)	φ8 lead 2		
	Guide	Linear ball guide		
Cross Roller	Main materials-Finishing	Stainless—Opposite side of the end face finishing		
	Weight	Uncovered	2.42kg	3.02kg
		Covered	2.48kg	3.12kg
Accuracy specification	Resolution (Pulse)	4μm/2μm		
		0.2μm (1/20 on resolution)		
	MAX speed	45mm/sec		
	Uni-directional positioning accuracy	Within 15μm	Within 25μm	
	Repeatability positioning accuracy	Within ±0.5μm		
	Load capacity	12kgf [11 7.6N]		
	Moment stiffness	Pitch 0.05/yaw 0.05/roll 0.05 ["/N · cm]		
	Lost motion	Within 1μm		
	Backlash	Within 1μm		
	Straightness	Within 7μm		
Slide Guide	Parallelism	Within 15μm		
	Motion parallelism	Within 20μm	Within 25μm	
	Pitching/Yawing	Within 30"/Within 20"	Within 35"/Within 20"	
	Limit sensor	Installed		
Sensor	Origin sensor	— ※Attachable in origin sensor option		
	Slit origin sensor	—		
	Provided screw (Hexagon-headed bolt)	12 of M4—14	16 of M4—14	

※ Might be changed specification due to motors. See page P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

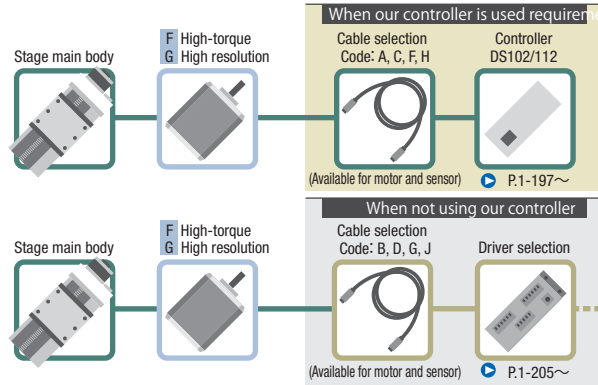
φ120

Other

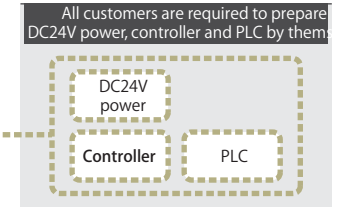
Motor option

**F** High-torque  
 Motor model  
 PK525HPB-C1

**G** High resolution  
 Motor model  
 PK523HPMB-C1

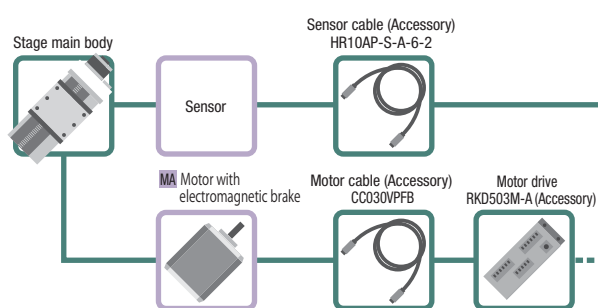


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

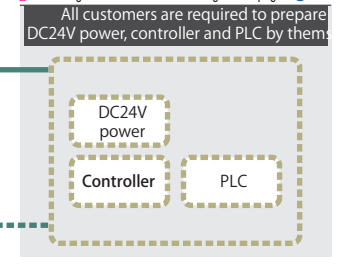


Motor option

**MA** With electromagnetic brake  
 Motor model  
 PKE545MC-A1

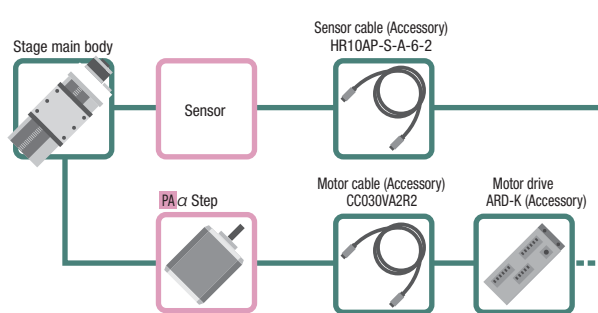


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

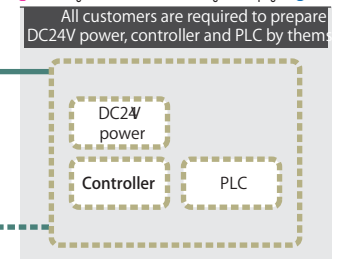


Motor option

**PA** α Step  
 Motor model  
 ARM24SAK

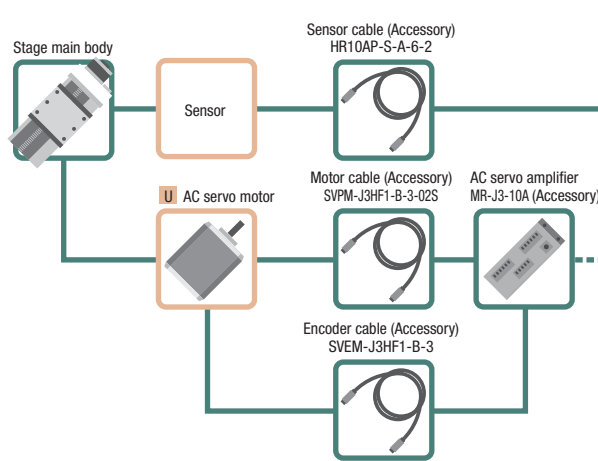


Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~



Motor option

**U** AC servo motor  
 Motor model  
 HF-KP053



All customers are required to prepare DC24V power, controller and PLC by them.

Cable connection diagram on page P.1-209~  
 Pin arrangement and connection diagram on page P.1-207~

Motor code	F	G	MA	PA	U
Feature	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type	5 phase stepping motor 0.75A/Phase			α step motor	AC servo motor
Motor model*	<b>PK525HPB-C1</b>	<b>PK523HPMB-C1</b>	<b>PKE545MC-A1</b>	<b>ARM24SAK</b>	<b>HF-KP053</b>
Resolution	Lead 2mm	Full/ Half	4μm/2μm	2μm/1μm	4μm/2μm
		Micro step (1/20 split)	0.2μm	0.1μm	0.2μm
MAX speed	Lead 2mm	45mm/sec	30mm/sec	40mm/sec	80mm/sec
					2μm (1000P/R setting)
					18 bits encoder (262144P/R)
					100mm/sec

\*Model is our own management model.

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

# Motorized Stage

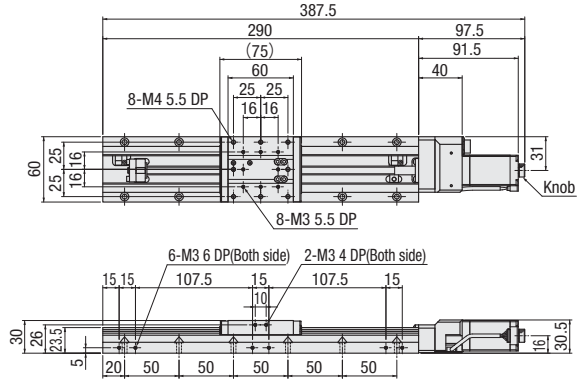
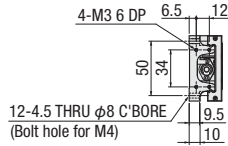
CAVE-X POSITIONER

## X-axis Linear Ball Guide: KXL06200/KXL06300

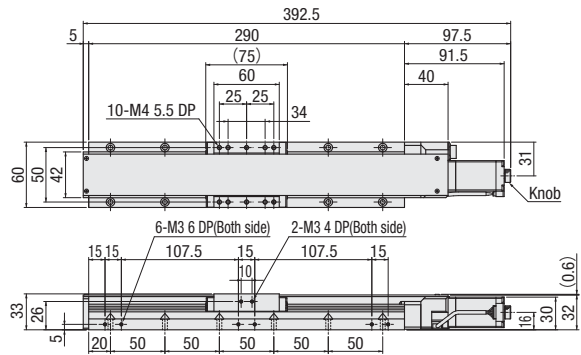
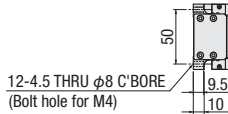
Motorized Stage

### Dimensional outline drawings

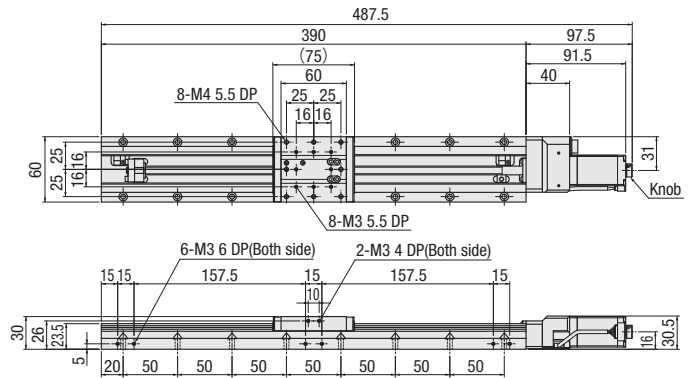
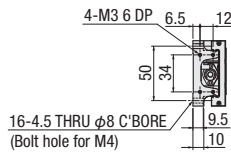
#### KXL06200-N2-F



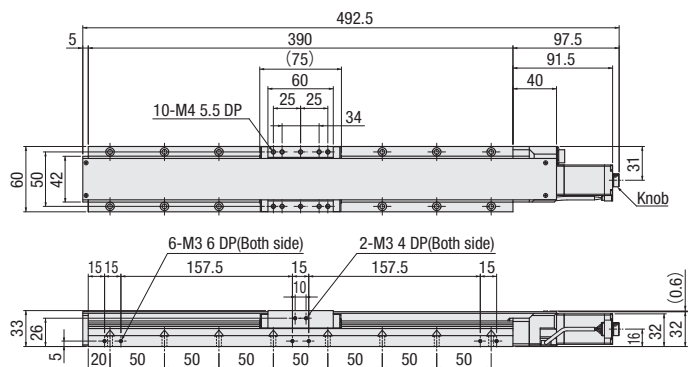
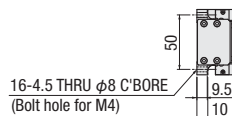
#### KXL06200-C2-F



#### KXL06300-N2-F



#### KXL06300-C2-F



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Dimensional outline drawings

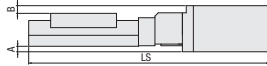
**F** High-torque

Motor model PK525HPB-C1

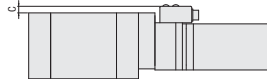
**G** High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

Model	F (High-torque) /G (High resolution) Common				F (High-torque)	G (High resolution)
	Motor size	A	B	C	LS	
KXL06200-N2-F,G	□28	—	0.5	—	388	368
KXL06300-N2-F,G					488	468

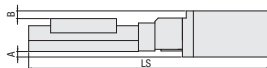
Covered

Model	F (High-torque) /G (High resolution) Common				F (High-torque)	G (High resolution)
	Motor size	A	B	C	LS	
KXL06200-C2-F,G	□28	—	—	—	393	373
KXL06300-C2-F,G					493	473

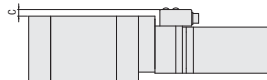
**MA** With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

Model	MA (With electromagnetic brake)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-N2-M	□42	5	7	6	415	388
KXL06300-N2-M					515	488

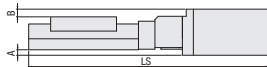
Covered

Model	MA (With electromagnetic brake)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-C2-M	□42	5	4	6	420	393
KXL06300-C2-M					520	493

**PA** α step

Motor model ARM24SAK

Side view



Top view



Uncovered

Model	PA (α step)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-N2-P	□28	—	0.5	6	381	388
KXL06300-N2-P					481	488

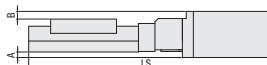
Covered

Model	PA (α step)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-C2-P	□28	—	—	6	386	393
KXL06300-C2-P					486	493

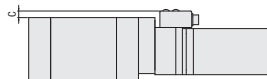
**U** AC servo motor

Motor model HF-KP053

Side view



Top view



Uncovered

Model	U (AC servo motor)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-N2-U	□40	4.7	6.5	6	410	388
KXL06300-N2-U					510	488

Covered

Model	U (AC servo motor)				F (High-torque)	
	Motor size	A	B	C	LS	
KXL06200-C2-U	□40	4.7	3.5	6	415	393
KXL06300-C2-U					515	493

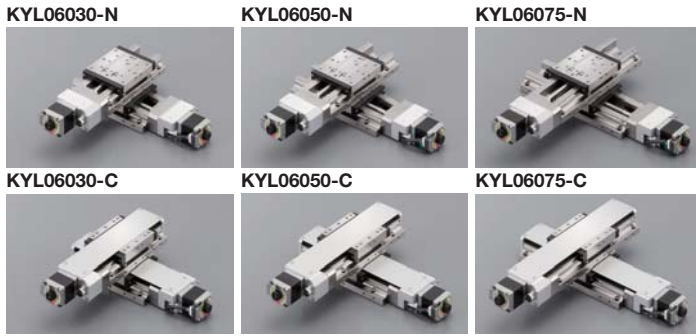
# Motorized Stage

CAVE-X POSITIONER

## XY-axis Linear Ball Guide: KYL06030/KYL06050/KYL06075

Motorized Stage

RoHS



Model Selection code Option code

**KYL06030-N1-C**

1 2 3 4 5 6

Cable P.1-207~  
Electrical specification P.1-077~

### 1 Travel length

030	30mm
050	50mm
075	75mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

### 4 Motor option

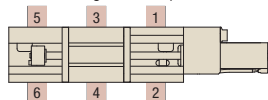
Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.  
■ Position of origin sensor option (Please choose one position.)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
\* The price includes M, P and U.  
Not available non-cable.  
\* See page P.1-207,209~ for details of cable.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	C,F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

### SPEC

Model	Uncovered	KYL06030-N1-C	KYL06030-N2-C	KYL06050-N1-C	KYL06050-N2-C	KYL06075-N1-C	KYL06075-N2-C
	Covered	KYL06030-C1-C	KYL06030-C2-C	KYL06050-C1-C	KYL06050-C2-C	KYL06075-C1-C	KYL06075-C2-C
Travel length		30mm		50mm		75mm	
Table size		60×60mm					
Feed screw (Ball screw)		$\varphi 8$ lead 1	$\varphi 8$ lead 2	$\varphi 8$ lead 1	$\varphi 8$ lead 2	$\varphi 8$ lead 1	$\varphi 8$ lead 2
Guide		Linear ball guide					
Main materials-Finishing		Stainless—Opposite side of the end face finishing					
Weight	Uncovered	2.56kg		2.8kg		3.08kg	
	Covered	2.68kg		2.88kg		3.32kg	
Resolution (Pulse)	Full/Half	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m	2 $\mu$ m/1 $\mu$ m	4 $\mu$ m/2 $\mu$ m
	Microstep	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)	0.1 $\mu$ m (1/20 on resolution)	0.2 $\mu$ m (1/20 on resolution)
MAX speed		30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec
Load capacity		10kgf [98N]					
Perpendicularity		Within 15 $\mu$ m/Full stroke		Within 25 $\mu$ m/Full stroke		Within 37.5 $\mu$ m/Full stroke	
Limit sensor		Installed					
Origin sensor		— ※Attachable in origin sensor option					
Slit origin sensor		—					
Provided screw (Hexagon-headed bolt)		8 of M4—14					

Stage accuracy specification	Uni-directional positioning accuracy	Within 5 $\mu$ m		Within 7 $\mu$ m	
	Repeatability positioning accuracy	Within $\pm 0.5\mu$ m		Within 1 $\mu$ m	
	Lost motion	Within 1 $\mu$ m		Within 3 $\mu$ m	
	Backlash	Within 1 $\mu$ m		Within 3 $\mu$ m	
	Straightness	Within 3 $\mu$ m		Within 20"/Within 15"	
	Pitching/Yawing	Within 20"/Within 15"		Within 15"/Within 10"	

※ Might be changed specification due to motors. See page P.1-213~ for details.

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\varphi 40$

$\varphi 50$

$\varphi 60$

$\varphi 70$

$\varphi 80$

$\varphi 100$

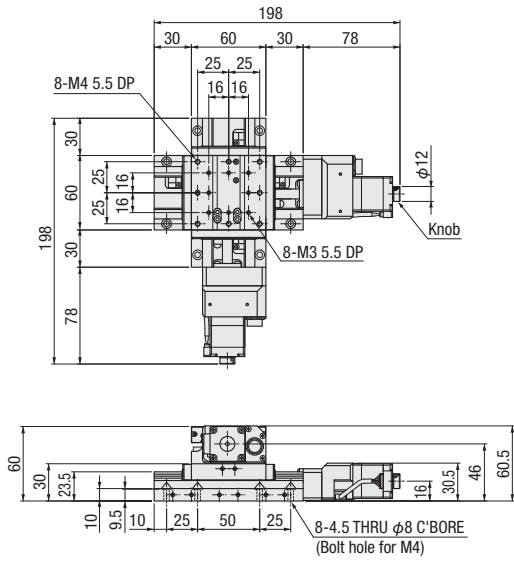
$\varphi 120$

Other

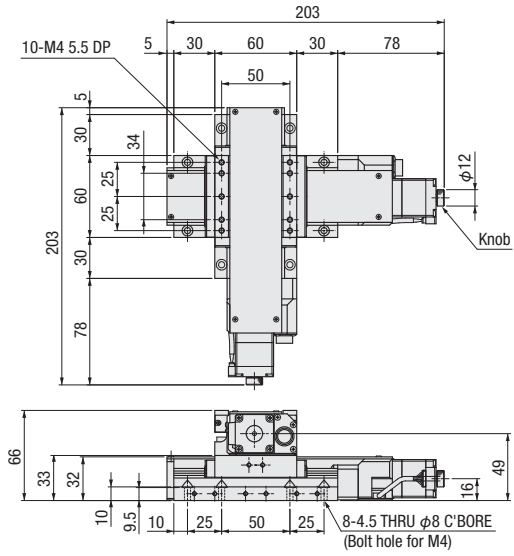


Dimensional outline drawings

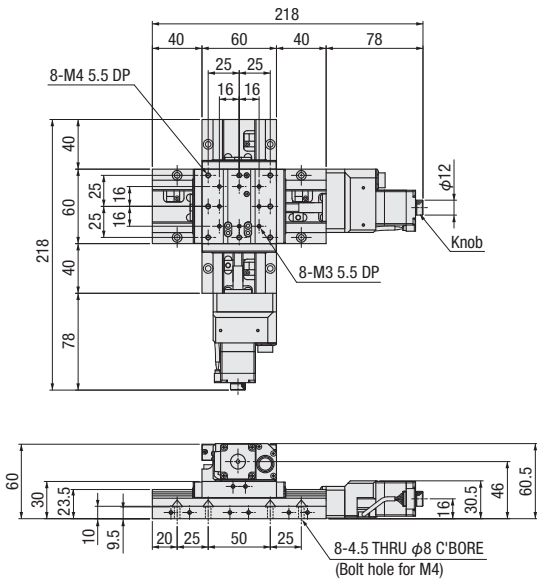
**KYL06030-N1-C (KYL06030-N2-C)**



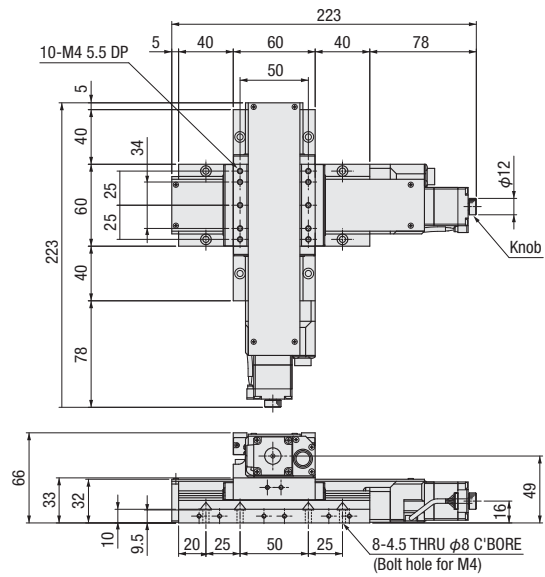
**KYL06030-C1-C (KYL06030-C2-C)**



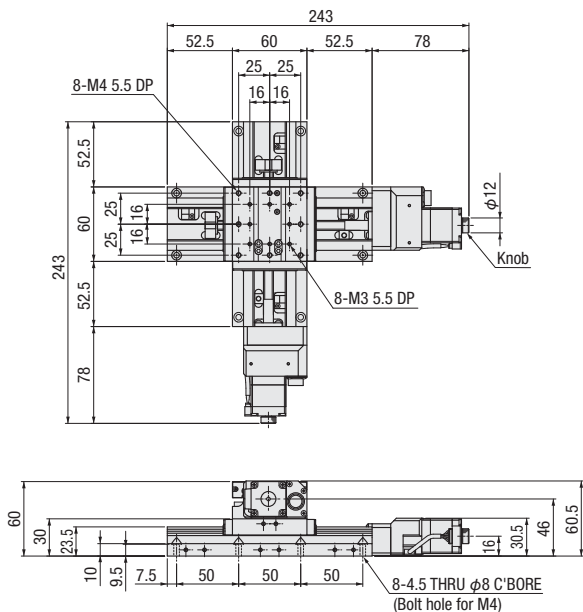
**KYL06050-N1-C (KYL06050-N2-C)**



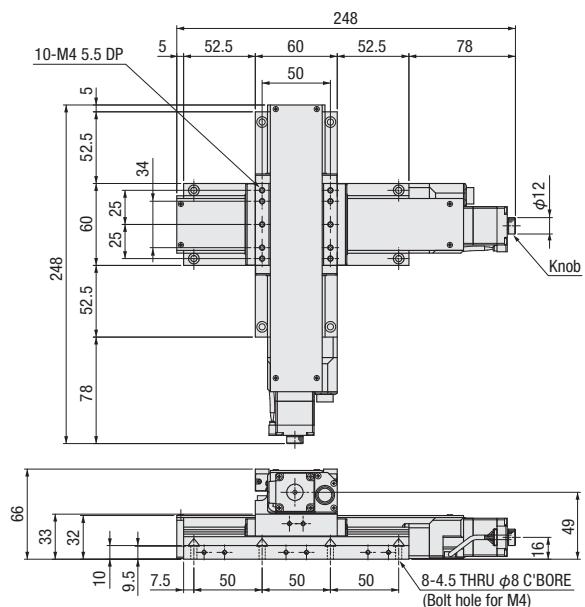
**KYL06050-C1-C (KYL06050-C2-C)**



**KYL06075-N1-C (KYL06075-N2-C)**



**KYL06075-C1-C (KYL06075-C2-C)**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

068

# Motorized Stage

CAVE-X POSITIONER

## XY-axis Linear Ball Guide: KYL06100/KYL06150

Motorized Stage



RoHS



▶ Cable P.1-207~  
 ◀ Electrical specification P.1-077~

### 1 Travel length

100	100mm
150	150mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

2	Lead 2mm
---	----------

### 4 Motor option

Code	Specification
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

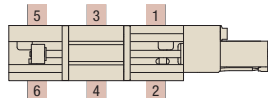
\* Code MA · PA · U is the set of driver and cable.  
 \* See page ▶ P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page ▶ P.1-079~ for details of origin sensor option.

■ Position of origin sensor option (Please choose one position)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	
U	Cable for servo motor	
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

\* See page ▶ P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

## SPEC

Model	Uncovered	KYL06100-N2-F	KYL06150-N2-F	
	Covered	KYL06100-C2-F	KYL06150-C2-F	
Mechanical specification	Travel length	100mm	150mm	
	Table size	60×60mm		
	Feed screw (Ball screw)	$\phi$ 8 lead 2		
	Guide	Linear ball guide		
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
	Weight	Uncovered	3.6kg	4.2kg
		Covered	3.72kg	4.32kg
Accuracy specification	Resolution (Pulse)	4 $\mu$ m/2 $\mu$ m		
		0.2 $\mu$ m (1/20 on resolution)		
	MAX speed	45mm/sec		
	Load capacity	10kgf [98N]		
	Perpendicularity	Within 50 $\mu$ m/Full stroke	Within 75 $\mu$ m/Full stroke	
Sensor	Limit sensor	Installed		
	Origin sensor	— ※Attachable in origin sensor option		
	Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)		8 of M4—14	14 of M4—14	
Slit accuracy specification	Uni-directional positioning accuracy	Within 10 $\mu$ m	Within 15 $\mu$ m	
	Repeatability positioning accuracy	Within $\pm$ 0.5 $\mu$ m		
	Lost motion	Within 1 $\mu$ m		
	Backlash	Within 1 $\mu$ m		
	Straightness	Within 5 $\mu$ m		
	Pitching/Yawing	Within 25" / Within 20"		

※ Might be changed specification due to motors. See page ▶ P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

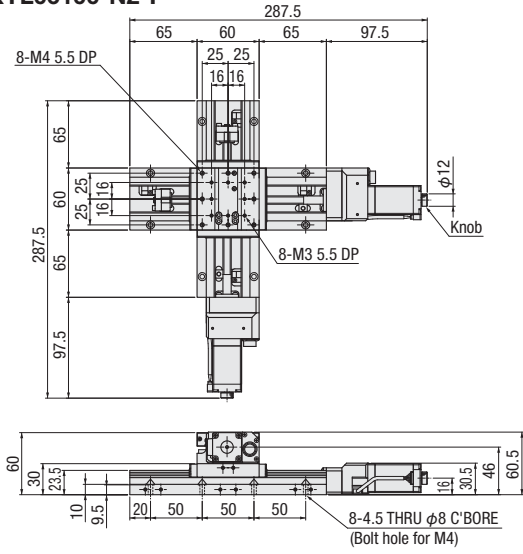
$\phi$ 100

$\phi$ 120

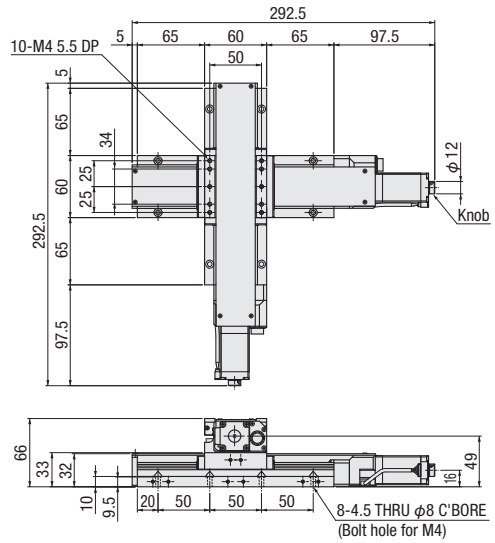
Other

Dimensional outline drawings

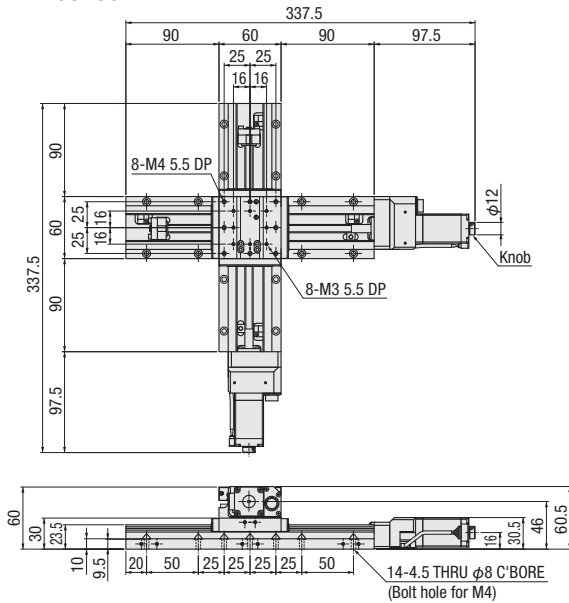
KYL06100-N2-F



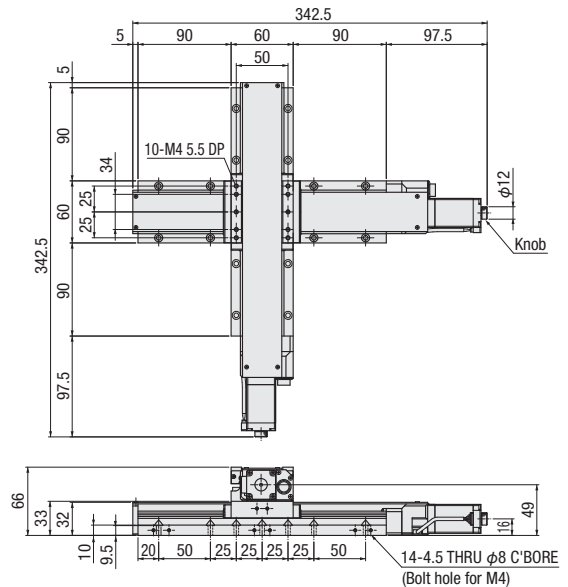
KYL06100-C2-F



KYL06150-N2-F



KYL06150-C2-F



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

070

# Motorized Stage

CAVE-X POSITIONER

## XY-axis Linear Ball Guide: KYL06200/KYL06300

Motorized Stage

KYL06200-N



KYL06300-N



KYL06200-C



KYL06300-C



RoHS

Model Selection code Option code

**KYL06** **200-N2-F**    

1      2 3      4 5 6

🔗 Cable P.1-207~  
🔗 Electrical specification P.1-077~

### 1 Travel length

200	200mm
300	300mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

2	Lead 2mm
---	----------

### 4 Motor option

Code	Specification
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	α Step (Driver set)
U	Servo motor (Amplifier set)

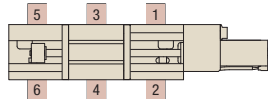
\* Code MA · PA · U is the set of driver and cable.  
\* See page P.1-077~ for details of motor option.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.

■ Position of origin sensor option (Please choose one position)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for α step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

\* See page P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

(Note)  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

### SPEC

Model	Uncovered	KYL06200-N2-F	KYL06300-N2-F
	Covered	KYL06200-C2-F	KYL06300-C2-F
Travel length		200mm	300mm
Table size			60×60mm
Feed screw (Ball screw)			φ8 lead 2
Guide			Linear ball guide
Main materials-Finishing			Stainless—Opposite side of the end face finishing
Weight	Uncovered	4.84kg	6.04kg
	Covered	4.96kg	6.24kg
Resolution (Pulse)	Full/ Half	4μm/2μm	
	Microstep	0.2μm (1/20 on resolution)	
MAX speed		45mm/sec	
Load capacity		10kgf [98N]	
Perpendicularity		Within 100μm/Full stroke	Within 150μm/Full stroke
Limit sensor		Installed	
Origin sensor		— ※Attachable in origin sensor option	
Slit origin sensor		—	
Provided screw (Hexagon-headed bolt)		12 of M4—14	16 of M4—14
Single axis accuracy specification	Uni-directional positioning accuracy	Within 15μm	Within 25μm
	Repeatability positioning accuracy		Within ±0.5μm
	Lost motion		Within 1μm
	Backlash		Within 1μm
	Straightness		Within 7μm
	Pitching/Yawing		Within 30"/Within 20"

※ Might be changed specification due to motors. See page P.1-213~ for details.



PART COMMUNITY

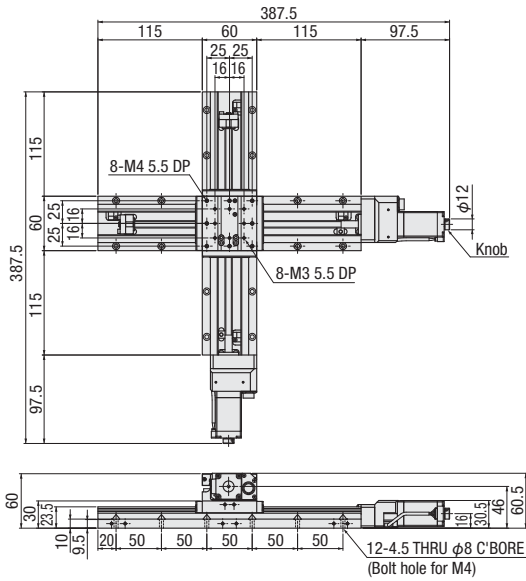
CAD DATA



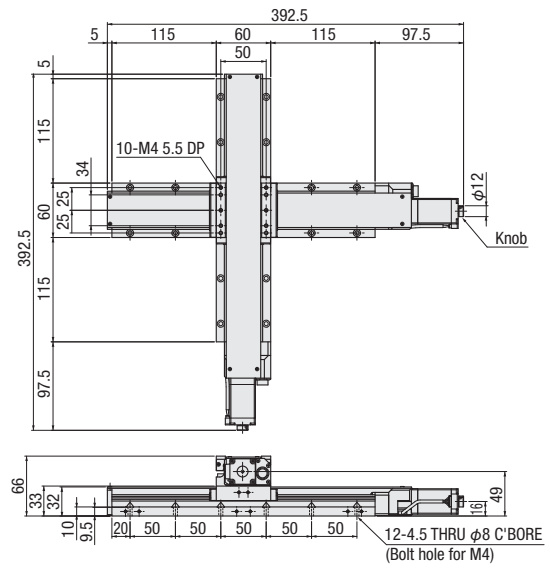
CAD 3D·2D

Dimensional outline drawings

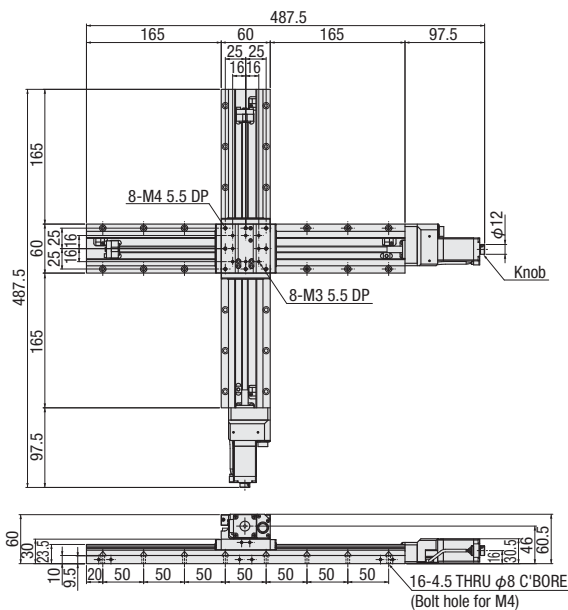
KYL06200-N2-F



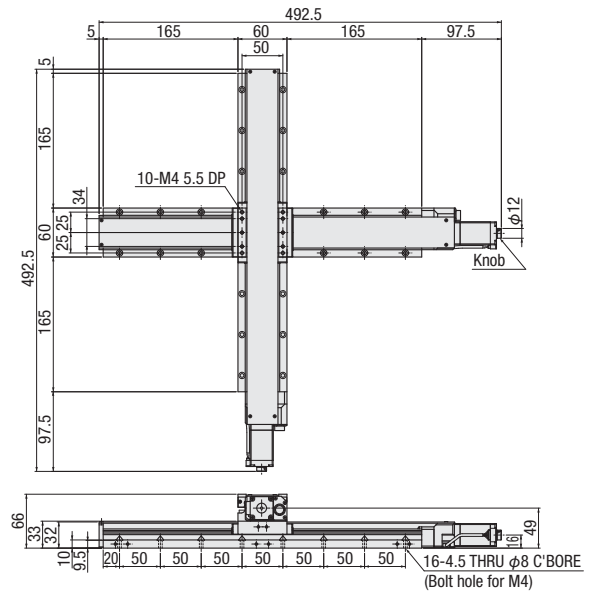
KYL06200-C2-F



KYL06300-N2-F



KYL06300-C2-F



Support guide option

We have a support guide option for 200mm and 300mm. You can use safely in overhang.

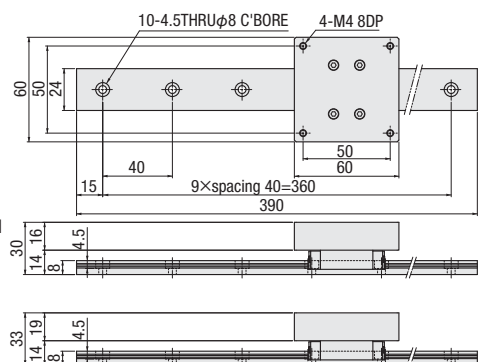
How to order

- For Uncovered model
  - APW6016A-390A
- For covered model
  - APW6019A-390A

Notes:

- Combination with slideguide, adaptor plate or CAVE-X POSITIONER should be selected customer side.
- ※It is recommended to adjust in parallelism under 10 $\mu$ m and within 100mm.
- Slide guide materials: Stainless.
- Adaptor plate materials: Aluminum.
- Grease: Multemp PS2.
- If you have any questions, feel free to contact us.

[Dimensions] Slide guide model: SSEBW14-390(MISUMI)



• For Uncovered model APW6016A-390A

• For covered model APW6019A-390A

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

072

# Motorized Stage

CAVE-X POSITIONER

## Z-axis Linear Ball Guide: KZL06030/KZL06050/KZL06075

KZL06030-N/KZL06050-N/KZL06075-N KZL06030-C/KZL06050-C/KZL06075-C



RoHS

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Model Selection code Option code

**KZL06 030-N1-C**

1 2 3 4 5 6

▶ Cable P.1-207~  
 ◀ Electrical specification P.1-077~

### 1 Travel length

030	30mm
050	50mm
075	75mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

1	Lead 1mm
---	----------

### 4 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	α Step (Driver set)
U	Servo motor (Amplifier set)

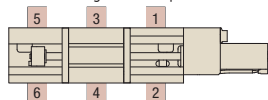
\* Code MA · PA · U is the set of driver and cable.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page ▶ P.1-079~ for details of origin sensor option.

■ Position of origin sensor option (Please choose one position.)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for α step	
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

\* See page ▶ P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

(Note) Please check available cable from compatibility list.

Not included cable for a main body. Please choose the code as below.

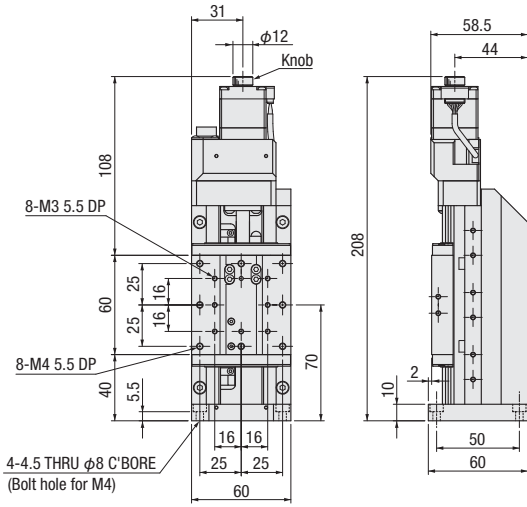
Motor/cable products list	Motor code	Cable code
	C,F,G	Blank, A~H,J
MA	M	
PA	P	
U	U	

SPEC							
Model	Uncovered			Covered			
	KZL06030-N1-C	KZL06050-N1-C	KZL06075-N1-C	KZL06030-C1-C	KZL06050-C1-C	KZL06075-C1-C	
Mechanical specification	Travel length	30mm	50mm	75mm	30mm	50mm	75mm
	Table size	60×60mm					
	Feed screw (Ball screw)	φ8 lead 1					
	Guide	Linear ball guide					
	Main materials-Finishing	Stainless—Opposite side of the end face finishing					
Accuracy specification	Weight	2kg	2.12kg	2.26kg	2.06kg	2.16kg	2.32kg
	Resolution (Pulse)	Full/Half	2μm/1μm				
		Microstep	0.1μm (1/20 on resolution)				
	MAX speed	20mm/sec					
	Load capacity (Excitation)	7kgf [68.6N]					
Sensor	Vertical degree	Within 15μm/Full stroke	Within 25μm/Full stroke	Within 37.5μm/Full stroke	Within 15μm/Full stroke	Within 25μm/Full stroke	Within 37.5μm/Full stroke
	Limit sensor	Installed					
	Origin sensor	— ※Attachable in origin sensor option					
	Slit origin sensor	—					
	Provided screw (Hexagon-headed bolt)	4 of M4—10					
Slits accuracy specification	Uni-directional positioning accuracy	Within 5μm		Within 7μm	Within 5μm		Within 7μm
	Repeatability positioning accuracy	Within ±0.5μm					
	Lost motion	Within 1μm					
	Backlash	Within 1μm					
	Straightness	Within 3μm					
	Pitching/Yawing	Within 20"/Within 15"					

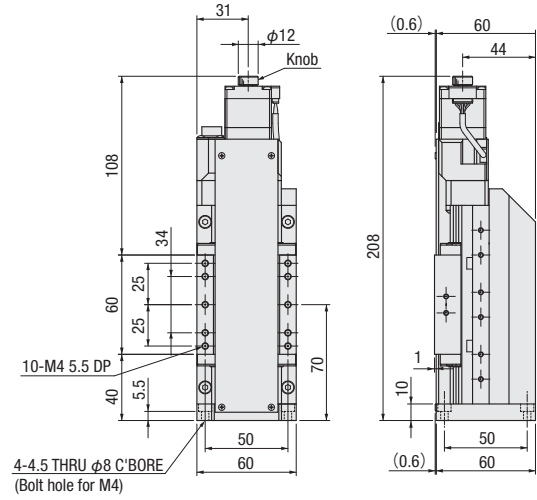
※ Might be changed specification due to motors. See page ▶ P.1-213~ for details.

Dimensional outline drawings

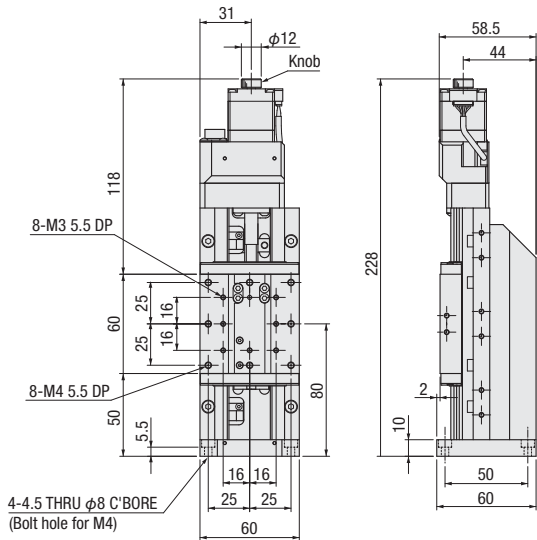
KZL06030-N1-C



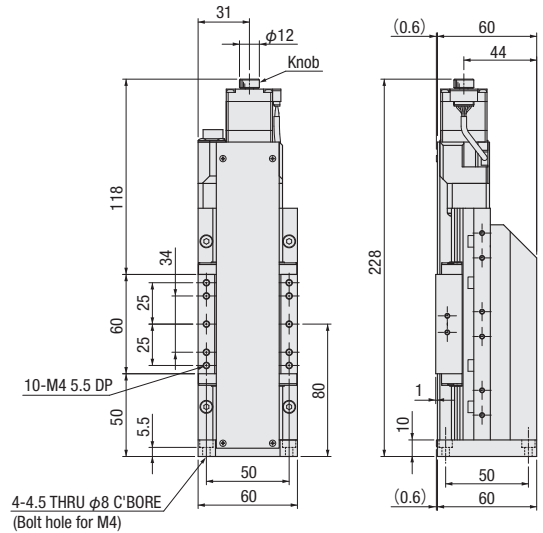
KZL06030-C1-C



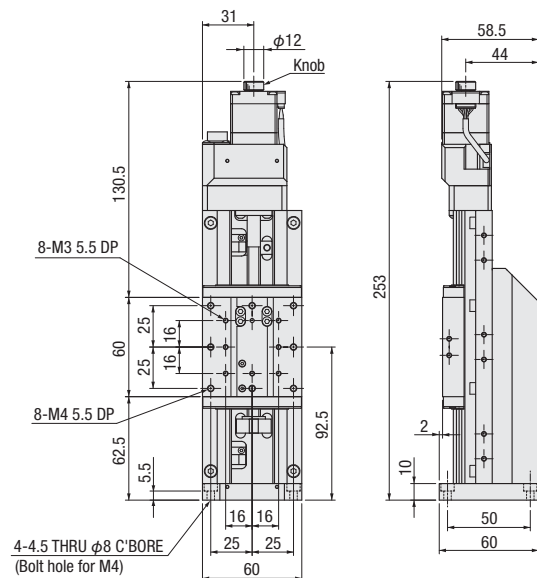
KZL06050-N1-C



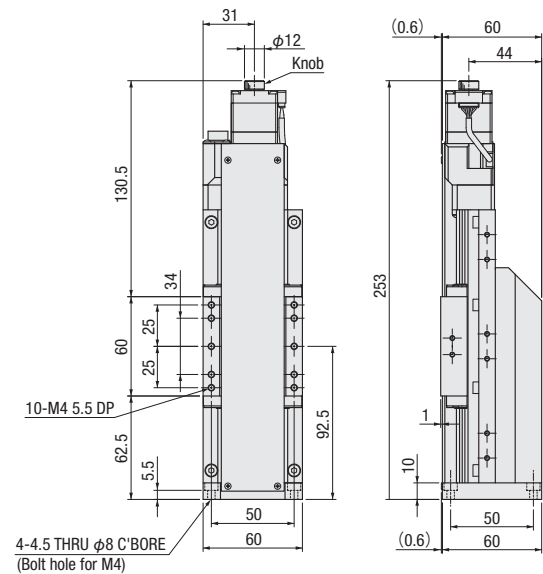
KZL06050-C1-C



KZL06075-N1-C



KZL06075-C1-C



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

# Motorized Stage

CAVE-X POSITIONER

## XYZ-axis Linear Ball Guide: KWL06030/KWL06050

Motorized Stage



RoHS

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Model Selection code Option code

**KWL06030-N1-C**

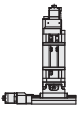
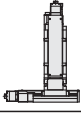
1 2 3 4 5 6

▶ Cable P.1-207~  
▶ Electrical specification P.1-077~

### 1 Travel length

030	30mm
050	50mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

1	Lead 1mm
---	----------

### 4 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
MA	With electromagnetic brake (Driver set)
PA	$\alpha$ Step (Driver set)
U	Servo motor (Amplifier set)

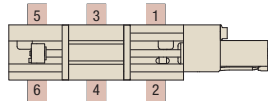
\* Code MA · PA · U is the set of driver and cable.

### 5 Origin sensor option

Code	Specification
Blank	None
1	CCW right side
2	CCW left side
3	Center right side
4	Center left side
5	CW right side
6	CW left side

\* See page P.1-079~ for details of origin sensor option.

■ Position of origin sensor option (Please choose one position.)



### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	
U	Cable for servo motor	
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* The price includes M, P and U.

Not available non-cable.

\* See page P.1-207,209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
Please check available cable from compatibility list.  
Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	C, F, G	Blank, A~H, J
	MA	M
	PA	P
U	U	

- Linear Ball
- CAVE-X Linear ball

- Cross Roller
- Slide Guide
- $\phi 40$
- $\phi 50$
- $\phi 60$
- $\phi 70$
- $\phi 80$
- $\phi 100$
- $\phi 120$
- Other

### SPEC

Model	Uncovered		Covered	
	KWL06030-N1-C	KWL06050-N1-C	KWL06030-C1-C	KWL06050-C1-C
Travel length	30mm	50mm	30mm	50mm
Table size	60×60mm			
Feed screw (Ball screw)	$\phi 8$ lead 1			
Guide	Linear ball guide			
Main materials-Finishing	Stainless—Opposite side of the end face finishing			
Weight	4.56kg	4.92kg	4.74kg	5.04kg
Accuracy specification	Resolution (Pulse)	Full/Half Microstep $2\mu\text{m}/1\mu\text{m}$		
	MAX speed	$0.1\mu\text{m}$ (1/20 on resolution) 20mm/sec		
	Load capacity	7kgf [68.6N]		
Sensor	Perpendicularity	Within $15\mu\text{m}$ / Full stroke	Within $25\mu\text{m}$ / Full stroke	Within $15\mu\text{m}$ / Full stroke Within $25\mu\text{m}$ / Full stroke
	Limit sensor	Installed		
	Origin sensor	— ※Attachable in origin sensor option		
	Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)	8 of M4—14			
Simple accuracy specification	Uni-directional positioning accuracy	Within $5\mu\text{m}$		
	Repeatability positioning accuracy	Within $\pm 0.5\mu\text{m}$		
	Lost motion	Within $1\mu\text{m}$		
	Backlash	Within $1\mu\text{m}$		
	Straightness	Within $3\mu\text{m}$		
Pitching/Yawing	Within $20''$ / Within $15''$			

※ Might be changed specification due to motors. See page P.1-213~ for details.



Dimensional outline drawings



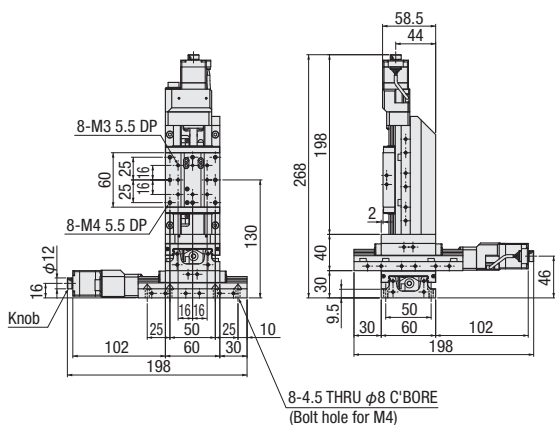
PART COMMUNITY

CAD DATA

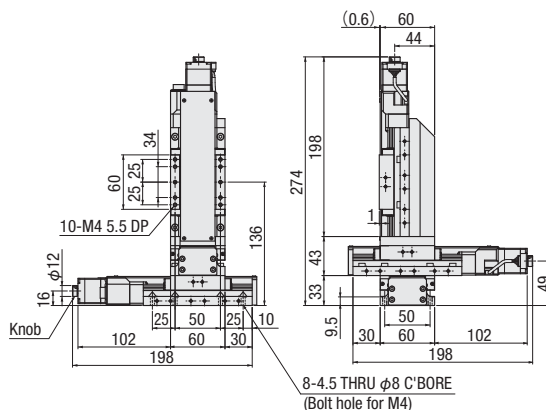


CAD 3D-2D

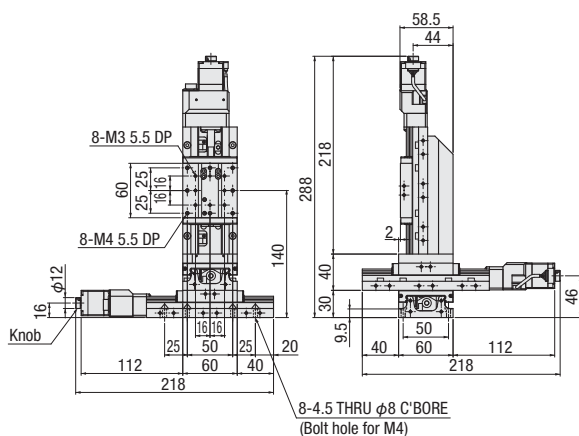
KWL06030-N1-C



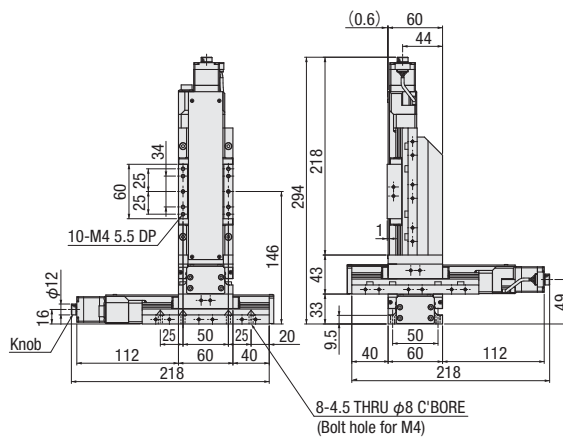
KWL06030-C1-C



KWL06050-N1-C



KWL06050-C1-C



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

076

## Electrical Specification: KXL Series

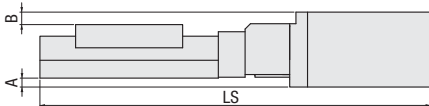
### Motor · Electrical specification

Motor code	C	F	G	MA	PA	U																																																																													
<b>Models</b>	KXL06030 / KXL06050 / KXL06075 KXL06100 / KXL06150 / KXL06200 / KXL06300																																																																																		
<b>Motor Specification (*1)</b>	<table border="1"> <tr> <td>Type</td> <td colspan="3">5 phase stepping motor 0.75A/Phase</td> <td colspan="2">α step motor</td> <td>AC servo motor</td> </tr> <tr> <td>Feature</td> <td>Standard</td> <td>High-torque</td> <td>High resolution</td> <td>With electromagnetic brake</td> <td>Small step-out</td> <td>High speed</td> </tr> <tr> <td>Model (*2)</td> <td>C005C-90215P</td> <td>PK525HPB-C1</td> <td>PK523HPMB-C1</td> <td>PK545MC-A1</td> <td>ARM24SAK</td> <td>HF-KP053</td> </tr> <tr> <td>Electromagnetic brake</td> <td colspan="3">—</td> <td>Installed</td> <td colspan="2">—</td> </tr> <tr> <td>Maker</td> <td colspan="5">Oriental Motor Co.,Ltd.</td> <td>Mitsubishi Electric corporation</td> </tr> <tr> <td>Step angle (Position detector)</td> <td colspan="2">0.72°</td> <td>0.36°</td> <td>0.72°</td> <td>0.36° (Set to 1000P/R)</td> <td>18 bits encoder (262144P/R)</td> </tr> <tr> <td>Mass</td> <td>0.11kg</td> <td>0.2kg</td> <td>0.11kg</td> <td>0.52kg</td> <td>0.15kg</td> <td>0.35kg</td> </tr> <tr> <td>Motor size</td> <td colspan="2">□ size L size</td> <td>28mm</td> <td>42mm</td> <td>28mm</td> <td>40mm</td> </tr> <tr> <td>Excitation (moment) maximum torque</td> <td>0.041N · m</td> <td>0.073N · m</td> <td>0.038N · m</td> <td>0.240N · m</td> <td>0.055N · m</td> <td>0.480N · m</td> </tr> <tr> <td>Driver type</td> <td colspan="3">—</td> <td>RKD507M-A</td> <td>ASD10A-K</td> <td>MR-J3-10A</td> </tr> <tr> <td>Input power (Voltage · frequency)</td> <td colspan="3">▶ P.1-205~</td> <td>Single phase AC100-115V 50/60Hz</td> <td>DC24V±10%</td> <td>Three and single phase AC200-230V 50/60Hz</td> </tr> </table>						Type	5 phase stepping motor 0.75A/Phase			α step motor		AC servo motor	Feature	Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed	Model (*2)	C005C-90215P	PK525HPB-C1	PK523HPMB-C1	PK545MC-A1	ARM24SAK	HF-KP053	Electromagnetic brake	—			Installed	—		Maker	Oriental Motor Co.,Ltd.					Mitsubishi Electric corporation	Step angle (Position detector)	0.72°		0.36°	0.72°	0.36° (Set to 1000P/R)	18 bits encoder (262144P/R)	Mass	0.11kg	0.2kg	0.11kg	0.52kg	0.15kg	0.35kg	Motor size	□ size L size		28mm	42mm	28mm	40mm	Excitation (moment) maximum torque	0.041N · m	0.073N · m	0.038N · m	0.240N · m	0.055N · m	0.480N · m	Driver type	—			RKD507M-A	ASD10A-K	MR-J3-10A	Input power (Voltage · frequency)	▶ P.1-205~			Single phase AC100-115V 50/60Hz	DC24V±10%	Three and single phase AC200-230V 50/60Hz
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Input power (Voltage · frequency)	▶ P.1-205~			Single phase AC100-115V 50/60Hz	DC24V±10%	Three and single phase AC200-230V 50/60Hz																																																																													
<b>Sensor</b>	<table border="1"> <tr> <td>Limit sensor</td> <td colspan="6">Installed</td> </tr> <tr> <td>Origin sensor</td> <td colspan="6">— *Sensor should be PM-L24 (SUNX Corp) when select the origin sensor</td> </tr> <tr> <td>Slit origin sensor</td> <td colspan="6">—</td> </tr> <tr> <td>Model</td> <td colspan="6">PM-L24 (Panasonic Industrial Devices SUNX)</td> </tr> <tr> <td>Power voltage</td> <td colspan="6">DC5~24V ±10%</td> </tr> <tr> <td>Consumption current</td> <td colspan="6">45mA or less (15mA or less per 1 sensor)</td> </tr> <tr> <td>Control output</td> <td colspan="6">NPN open collector output DC30V or less 50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA</td> </tr> <tr> <td>Output logic</td> <td colspan="6">On detection (light shield condition): Output transistor OFF (Non-continuity)</td> </tr> </table>						Limit sensor	Installed						Origin sensor	— *Sensor should be PM-L24 (SUNX Corp) when select the origin sensor						Slit origin sensor	—						Model	PM-L24 (Panasonic Industrial Devices SUNX)						Power voltage	DC5~24V ±10%						Consumption current	45mA or less (15mA or less per 1 sensor)						Control output	NPN open collector output DC30V or less 50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA						Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)																										
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Control output	NPN open collector output DC30V or less 50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA																																																																																		
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)																																																																																		
<b>Connector</b>	<table border="1"> <tr> <td rowspan="2">Motor</td> <td>Model</td> <td>HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)</td> <td>350782-1 (Tyco Electronics Japan G.K.)</td> <td>5557-10R (Japan Molex)</td> <td>Motor cable</td> <td>—</td> </tr> <tr> <td>Receiving connector</td> <td>HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)</td> <td>350720-1 (Tyco Electronics Japan G.K.)</td> <td>5559-10P (Japan Molex)</td> <td>Encoder</td> <td>—</td> </tr> <tr> <td rowspan="2">Sensor</td> <td>Model</td> <td>HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)※In common with a motor</td> <td colspan="4">HR10A-7J-6P (73) (Hirose Electric Co.,Ltd.)</td> </tr> <tr> <td>Receiving connector</td> <td>HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)※In common with a motor</td> <td colspan="4">HR10A-7P-6S (73) (Hirose Electric Co.,Ltd.)</td> </tr> <tr> <td rowspan="2">Motor cable</td> <td>Motor cable</td> <td colspan="2">—</td> <td>JN4FT04SJ1-R (JAE)</td> <td>Motor cable</td> <td>—</td> </tr> <tr> <td>Encoder</td> <td colspan="2">—</td> <td>1674320-1 (Tyco Electronics Japan G.K.)</td> <td>Encoder</td> <td>—</td> </tr> </table>						Motor	Model	HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)	350782-1 (Tyco Electronics Japan G.K.)	5557-10R (Japan Molex)	Motor cable	—	Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	350720-1 (Tyco Electronics Japan G.K.)	5559-10P (Japan Molex)	Encoder	—	Sensor	Model	HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)※In common with a motor	HR10A-7J-6P (73) (Hirose Electric Co.,Ltd.)				Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)※In common with a motor	HR10A-7P-6S (73) (Hirose Electric Co.,Ltd.)				Motor cable	Motor cable	—		JN4FT04SJ1-R (JAE)	Motor cable	—	Encoder	—		1674320-1 (Tyco Electronics Japan G.K.)	Encoder	—																																						
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<b>Accuracy specification</b>	<table border="1"> <tr> <td rowspan="4">Resolution</td> <td rowspan="2">Lead 1mm</td> <td>Full/Half</td> <td>2μm/1μm</td> <td>1μm/0.5μm</td> <td>2μm/1μm</td> <td>1μm/0.5μm</td> <td rowspan="4">18 bits encoder (262144P/R)</td> </tr> <tr> <td>Micro step (1/20 split)</td> <td>0.1μm</td> <td>0.05μm</td> <td>0.1μm</td> <td>—</td> </tr> <tr> <td rowspan="2">Lead 2mm</td> <td>Full/Half</td> <td>4μm/2μm</td> <td>2μm/1μm</td> <td>4μm/2μm</td> <td>2μm/1μm</td> </tr> <tr> <td>Micro step (1/20 split)</td> <td>0.2μm</td> <td>0.1μm</td> <td>0.2μm</td> <td>—</td> </tr> <tr> <td rowspan="2">Max. speed</td> <td>Lead 1mm</td> <td>30mm/sec</td> <td>35mm/sec</td> <td>25mm/sec</td> <td>25mm/sec</td> <td>40mm/sec</td> <td>50mm/sec</td> </tr> <tr> <td>Lead 2mm</td> <td>35mm/sec</td> <td>45mm/sec</td> <td>30mm/sec</td> <td>40mm/sec</td> <td>80mm/sec</td> <td>100mm/sec</td> </tr> </table>						Resolution	Lead 1mm	Full/Half	2μm/1μm	1μm/0.5μm	2μm/1μm	1μm/0.5μm	18 bits encoder (262144P/R)	Micro step (1/20 split)	0.1μm	0.05μm	0.1μm	—	Lead 2mm	Full/Half	4μm/2μm	2μm/1μm	4μm/2μm	2μm/1μm	Micro step (1/20 split)	0.2μm	0.1μm	0.2μm	—	Max. speed	Lead 1mm	30mm/sec	35mm/sec	25mm/sec	25mm/sec	40mm/sec	50mm/sec	Lead 2mm	35mm/sec	45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec																																						
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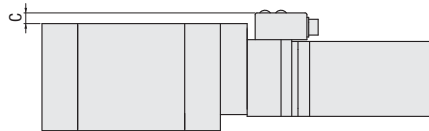
\*1 See page ▶ P.1-213~ for details of single motor specification \*2 Model is our own management model. \* The electric specification of XY (PMG), Z (PZG), XYZ (PMZG) are the same.

### Dimensional outline drawings

#### Side view



#### Top view



#### Standard type

Motor code	Size □ [mm]	A	B	C	LS						
					30	50	75	100	150	200	300
C	28	—	0.5	—	198	218	243	268	318	368	468
F	28	—	0.5	—	218	238	263	288	338	388	488
G	28	—	0.5	—	198	218	243	268	318	368	468
MA	42	5	7	6	245	265	290	315	365	415	515
PA	28	—	0.5	6	211	231	256	281	331	381	481
U	40	4.7	6.5	6	240	260	285	310	360	410	510

#### Covered type

Motor code	Size □ [mm]	A	B	C	LS						
					30	50	75	100	150	200	300
C	28	—	—	—	203	223	248	273	323	373	473
F	28	—	—	—	223	243	268	293	343	393	493
G	28	—	—	—	203	223	248	273	323	373	473
MA	42	5	4	6	250	270	295	320	370	420	520
PA	28	—	—	6	216	236	261	286	336	386	486
U	40	4.7	3.5	6	245	265	290	315	365	415	515

Note: The motor connector is projected from the upper, bottom and side surface in the motor code MA.

Pin allocation · Connection diagram

Motor code	KXL series	Motor code	KXL series
C.F.G	<p>[Motor and sensor pin] [Motor and sensor connection diagram (the same)]                      allocation (the same)]</p> <p>1 Motor lead (Blue)                      2 Motor lead (Red)                      3 Motor lead (Orange)                      4 Motor lead (Green)                      5 Motor lead (Black)                      6 CWLS output                      7 CCWLS output                      8 Open                      9 Power input (+)                      10 ORG output                      11 Power input (-)                      12 F.G.</p> <p>※ Cable must be selected from option code of each products.                      See page P.1-211 for details of cable.</p>	MA	<p>[Pin allocation (motor)] [Connection diagram (motor)]</p> <p>1 Motor lead (Blue)                      2 Motor lead (Red)                      3 Motor lead (Orange)                      4 Motor lead (Green)                      5 Motor lead (Black)                      6 Open                      7 Open                      8 Power input (+)                      9 Power input (-)</p> <p>※ Cable model: CC030VPFB See page P.1-211 for details.</p>
	<p>※ Motor cable model: CC030VA2R2 See page P.1-211 for details.</p>		<p>[Motor and sensor pin] [Motor and sensor connection diagram (sensor)]                      allocation (sensor)]</p> <p>1 CWLS output                      2 CCWLS output                      3 ORG output                      4 NORG output                      5 Power input (+)                      6 Power input (-)</p> <p>※ Cable model: HR10AP-S-A-6-2 See page P.1-212 for details.</p>
PA	<p>[Motor and sensor pin] [Motor and sensor connection diagram (sensor)]                      allocation (sensor)]</p> <p>1 CWLS output                      2 CCWLS output                      3 ORG output                      4 NORG output                      5 Power input (+)                      6 Power input (-)</p> <p>※ Cable model: HR10AP-S-A-6-2 See page P.1-212 for details</p>	U	<p>[Motor and sensor pin] [Motor and sensor connection diagram (sensor)]                      allocation (sensor)]</p> <p>1 CWLS output                      2 CCWLS output                      3 ORG output                      4 NORG output                      5 Power input (+)                      6 Power input (-)</p> <p>※ Cable model: HR10AP-S-A-6-2 See page P.1-212 for details.</p>
	<p>※ Motor cable model: SVPM-J3HF1-B-3-02S See page P.1-211 for details.</p> <p>※ encoder cable model: SVEM-J3HF1-B-3 See page P.1-211 for details.</p>		<p>[Motor and sensor pin] [Motor and sensor connection diagram (sensor)]                      allocation (sensor)]</p> <p>1 CWLS output                      2 CCWLS output                      3 ORG output                      4 NORG output                      5 Power input (+)                      6 Power input (-)</p> <p>※ Cable model: HR10AP-S-A-6-2 See page P.1-212 for details.</p>

Cable type

Great deal purchase both of cable and code.  
 Cable connection diagram shows page P.1-207~

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
F	Robot cable 2m	D214-2-2R
H	Robot cable 4m	D214-2-4R
G	Robot cable 2m one end loose	D214-2-2RK
J	Robot cable 4m one end loose	D214-2-4RK

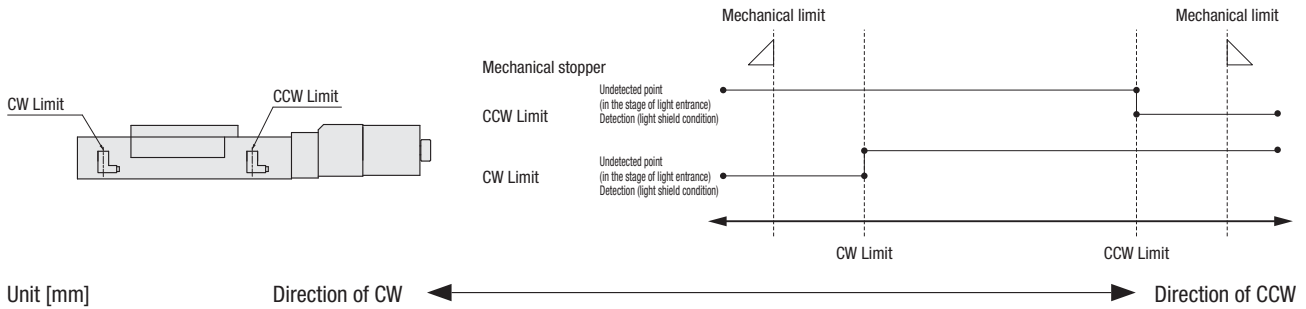
Motor code [MA · PA · U] compatible cable

One set for motor driver and motor cable(encoder)

Motor code	Cable code	Driver type	Motor cable	Encoder cable	Sensor cable
MA	M	RKSD503M-A (Oriental Motor Co.,Ltd.)	CC030VPFB P.1-211 Motor code MA	—	HR10AP-S-A-6-2 P.1-212 Refer sensor connection diagram
PA	P	ARD-K (Oriental Motor Co.,Ltd.)	CC030VA2R2 P.1-211 Motor code PA	—	
U	U	MR-J3-10A (Mitsubishi Electric corporation)	SVPM-J3HF1-B-3-02S P.1-211 Motor code U	SVEM-J3HF1-B-3 P.1-212 Motor code U	

## Electrical Specification: KXL Series

### Timing chart

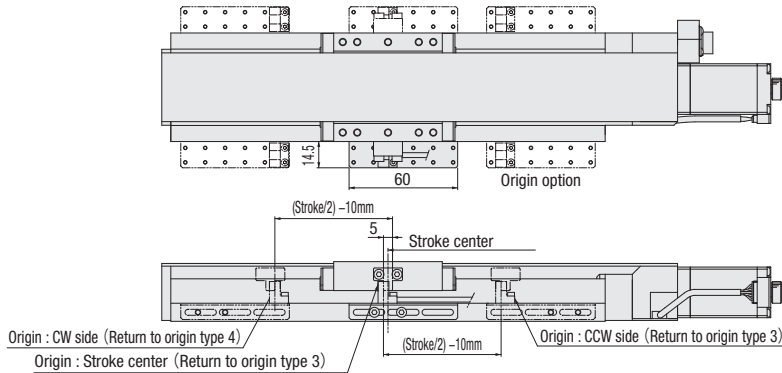


Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	CCW Limit	Mechanical limit
<b>KXL06030</b>	Stroke center	17.5	15.5	15.5	17.5
<b>KXL06050</b>	Stroke center	27.5	25.5	25.5	27.5
<b>KXL06075</b>	Stroke center	40	37.5	37.5	40
<b>KXL06100</b>	Stroke center	52.5	50.5	50.5	52.5
<b>KXL06150</b>	Stroke center	77.5	75.5	75.5	77.5
<b>KXL06200</b>	Stroke center	102.5	100.5	100.5	102.5
<b>KXL06300</b>	Stroke center	152.5	150.5	150.5	152.5

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

### Sensor option dimensions

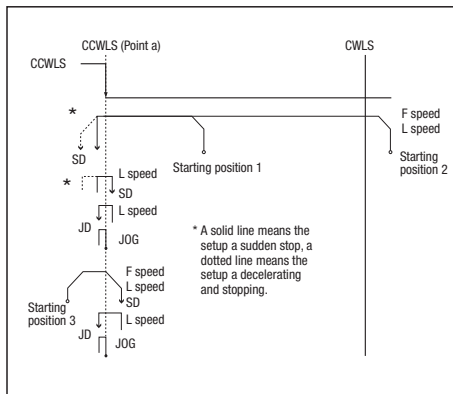


**KXL series recommendation return to origin method**

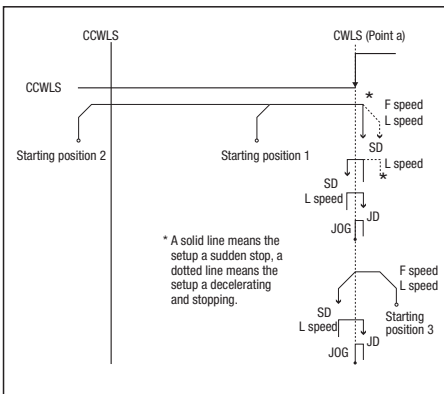
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

**Origin sensor option when not use**

**[Type5]** Detect in the direction of CCW and perform detected process for CW edge (point a) of CWLS signal.



**[Type6]** Detect in the direction of CW and perform detected process for CCW edge (point a) of CWLS signal.

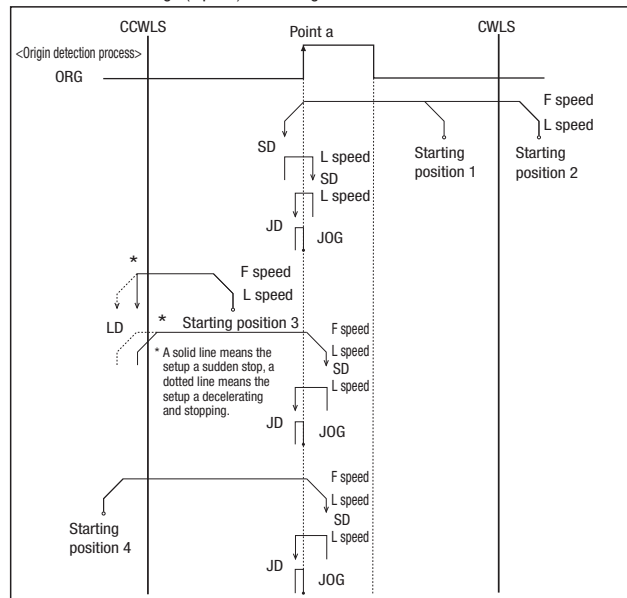


**[Type11]** After finished type5, perform detected process for CCW edge of TIMING signal.

**[Type12]** After finished type6, perform detected process for CW edge of TIMING signal.

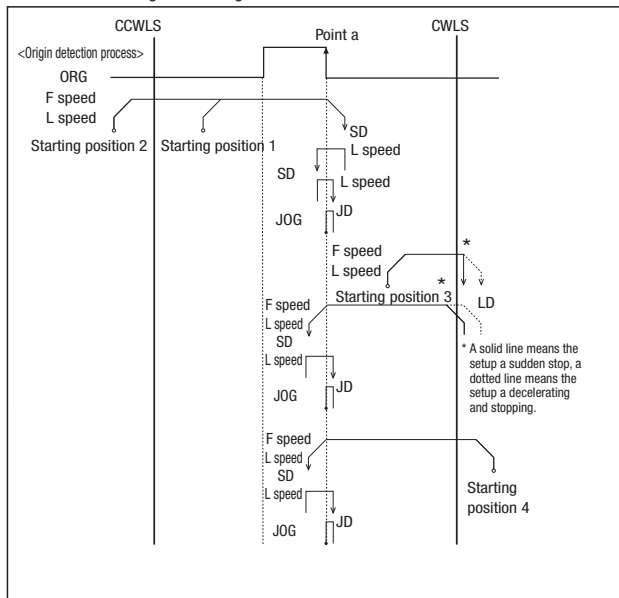
**Origin sensor option when use**

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Type10]** After finished Type4, perform detected process for CW edge of TIMING signal.

Return to sequence ▶ P.1-201~

**Adaptive driver**

**Driver** ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	Micro step (1~1/250 [16 steps])	Normal (Full/Half)

AC100V input

Model	RKD507-A
Divisions	Micro step (1~1/250 [16 steps])

**Adaptive stepping motor controller**

**Controller** ▶ P.1-197~

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102

## Cross Roller Guide Guidance



It is “Light weight”  
“Compact size” and  
“High precision” Stages  
because of the aluminum  
main material.

### ■ Usage

- Automatic focusing
- Precision positioning for lens and electronic parts.

## Features of Cross roller guide

### ■ Light weight

- ◎ It is made of aluminium to weight as little as possible.

### ■ Compact

#### KXC series

- ◎ As sensor is embedded in a stage body, projection from the table surface is small.

You can use it without though to opposite hand.

#### KX series

- ◎ Not only the thin body but high precision. Available maximum 25kg load capacity.



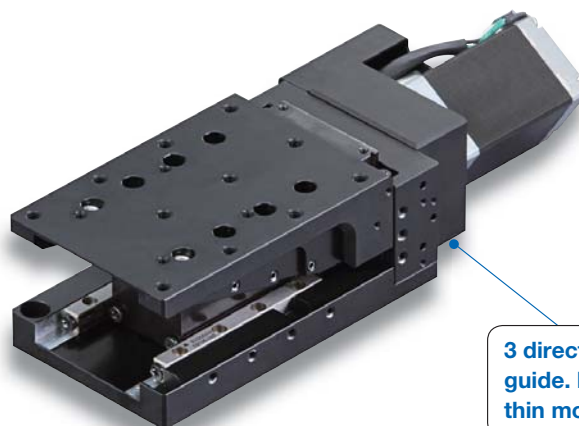
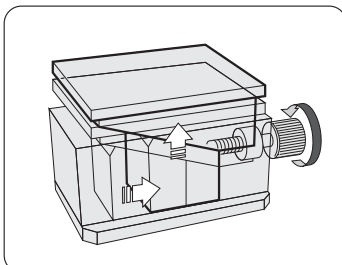
### ■ High precision

- ◎ Satisfy a high rigidity by a linear contact with V-groove and cross roller. It is ideal for fine feeding because of a little operation slip and a low friction.

## Feature of horizontal Z wedge type

Place the cross roller guide to horizontal, oblique and vertical direction, and it allows stage table to be shifted up or down with precision ball screw drive. All of the sliding part is configured in the rotational motion, drive high precision, to be effective against moment load.

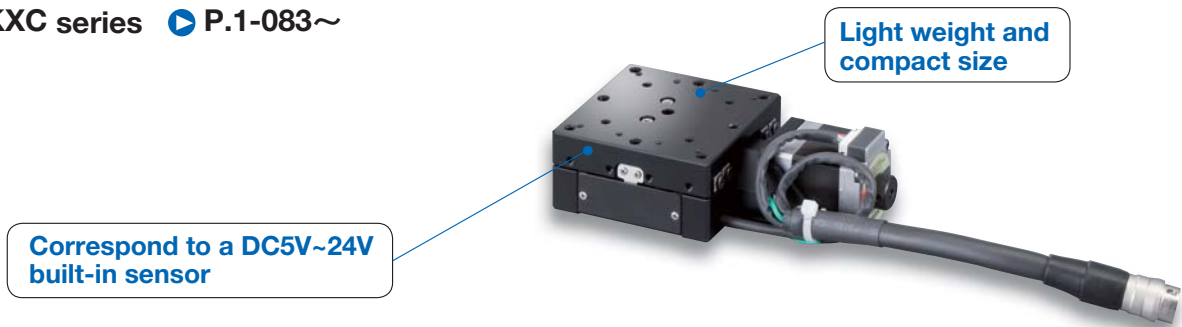
### Wedge type image



3 directions cross roller guide. High rigidity and thin model.

## High performance

KXC series ▶ P.1-083~



KX series ▶ P.1-093~



### ■ Cross roller guide stroke line-up

15mm	20mm	25mm	30mm	40mm	50mm	70mm	100mm
------	------	------	------	------	------	------	-------

### Available various motors

Selectable high-torque, high resolution and  $\alpha$ step. \* Need to separately confirmation to use the electromagnetic brake.  
 Please see product pages for more information. \* Unselectable some parts of types.

## For use correctly

### ▽How to mount

Stroke the upper plate to CW or CCW. Screw on bolt holes for each 2. (Total 4 screws)

### ▽About object on the upper or lower stage.

Stage surface might be deformed and Mounting unflat object and set to the unflat place can affect to be deformed stage surface and decreasing accuracy. When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.

### ▽Positioning

#### ■Position of stage mounting

All products SPEC shows must be shown flat setting condition.

Pay attention to mount such as up side down, vertical on the side and horizontal on the side.

Load capacity and accuracy might be changed by the positioning.

Please feel free to ask us for more information.

## X-axis Cross Roller Guide: KXC04015/KXC06020

Motorized Stage

KXC04015-C



KXC04015-P



KXC06020-C



KXC06020-F



KXC06020-G



KXC06020-P



See page P009

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Model Selection code Option code

**KXC 04015-**

1 2 3 4

Cable P.1-207~  
Electrical specification P.1-091~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

\* Not available 04020 and 06015

### 2 Travel length

015	15mm
020	20mm

### 3 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
PA	<input type="checkbox"/> 28 $\alpha$ Step (Driver set)

\* PA can choose only cable code P. Cannot choose the blank.  
\* In case of KXC04, can be chosen only C and PA.

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—
P	Cable for $\alpha$ step 3m	—

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207,209~ for cable details.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

$\phi$ 100

$\phi$ 120

Other

## SPEC

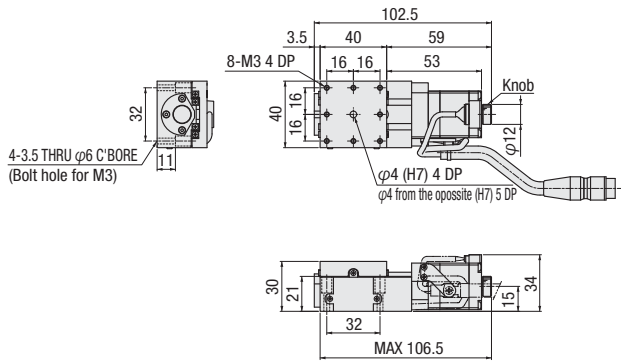
Model		KXC04015-C	KXC04015-PA	KXC06020-C	KXC06020-F	KXC06020-G	KXC06020-PA	
Mechanical specification	Travel length	15mm		20mm				
	Table size	40×40mm		60×60mm				
	Feed screw (Ball screw)	$\phi$ 6 lead 1		$\phi$ 8 lead 1				
	Guide	Crossed roller guide						
Main materials-Finishing	Aluminum—Black almite finishing							
	Weight	0.31kg	0.36kg	0.44kg	0.54kg	0.44kg	0.49kg	
Accuracy specification	Resolution (Pulse)	Full/Half	2 $\mu$ m/1 $\mu$ m	1 $\mu$ m (Set to 1000P/R)	2 $\mu$ m/1 $\mu$ m		1 $\mu$ m/0.5 $\mu$ m	1 $\mu$ m (Set to 1000P/R)
		Microstep	0.1 $\mu$ m (1/20 on resolution)	—	0.1 $\mu$ m (1/20 on resolution)	0.05 $\mu$ m (1/20 on resolution)		—
	MAX speed	10mm/sec			20mm/sec			
	Uni-directional positioning accuracy	Within 10 $\mu$ m			Within 5 $\mu$ m			
	Repeatability positioning accuracy	Within $\pm$ 0.5 $\mu$ m			Within $\pm$ 0.3 $\mu$ m			
	Load capacity	5.0kgf [49N]						
	Moment stiffness	Pitch 0.33/yaw 0.44/roll 0.37["/N·cm]			Pitch 0.15/yaw 0.12/roll 0.07["/N·cm]			
	Lost motion	Within 1 $\mu$ m						
	Backlash	Within 0.5 $\mu$ m						
	Straightness	Within 3 $\mu$ m						
Sensor	Parallelism	Within 30 $\mu$ m						
	Motion parallelism	Within 10 $\mu$ m						
	Pitching/Yawing	Within 25"/Within 20"			Within 20"/Within 15"			
Limit sensor	Installed							
Origin sensor	Installed							
Slit origin sensor	—							
Provided screw (Hexagon-headed bolt)	4 of M3—16			4 of M4—16				

※ Motor code [C·F·G] not include the cable. Choose the cable from cable code table.  
※ Motor code [P] includes the driver, motor and sensor cable.

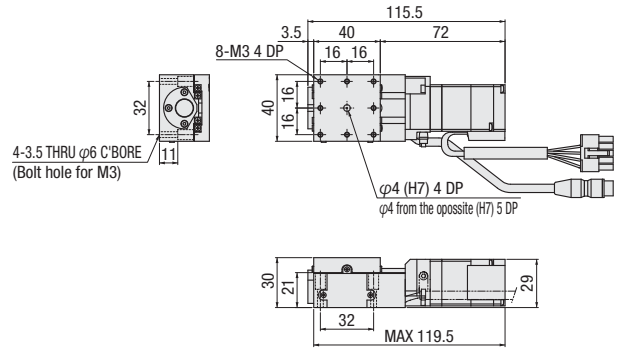


Dimensional outline drawings

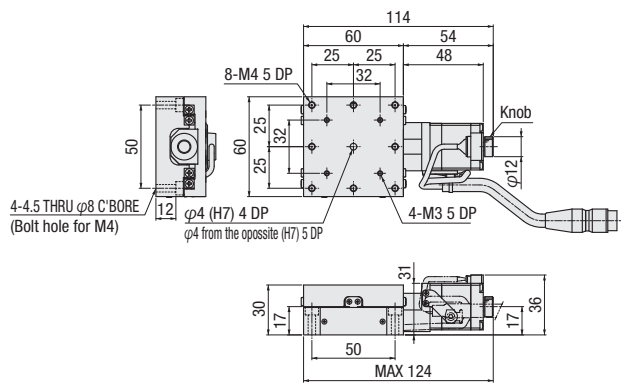
KXC04015-C



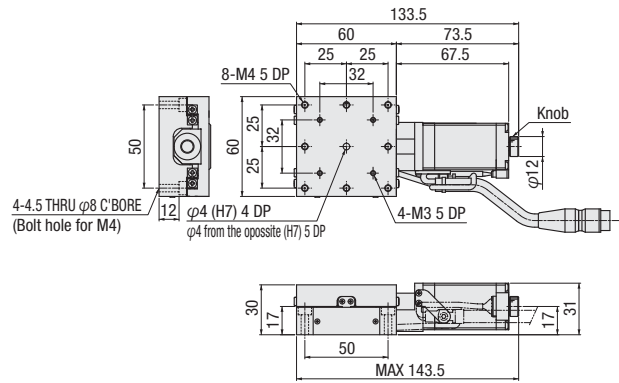
KXC04015-PA



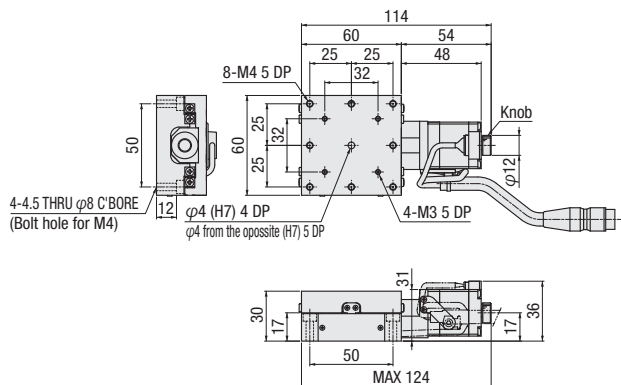
KXC06020-C



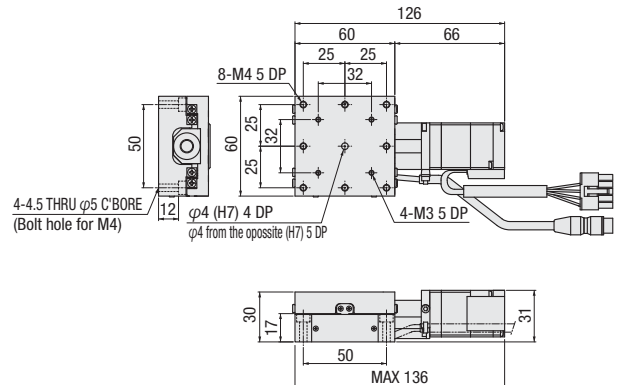
KXC06020-F



KXC06020-G



KXC06020-PA



Motorized Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

## XY-axis Cross Roller Guide: KYC04015/KYC06020

RoHS

KYC04015-C



KYC04015-P



KYC06020-C



KYC06020-F



KYC06020-G



KYC06020-P



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Model Selection code Option code

**KYC 04015-**

1 2 3 4

● Cable P.1-207~  
● Electrical specification P.1-091~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

\* Not available 04020 and 06015

### 2 Travel length

015	15mm
020	20mm

### 3 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
PA	<input type="checkbox"/> 28 α Step (Driver set)

\* PA can choose only cable code P. Cannot choose the blank.

\* In case of KXC04, can be chosen only C and PA.

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—
P	Cable for α step 3m	—

\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for more cable details.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

## SPEC

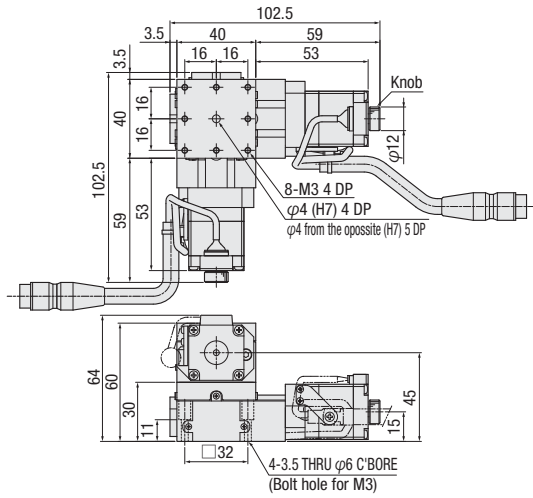
Model	KYC04015-C	KYC04015-PA	KYC06020-C	KYC06020-F	KYC06020-G	KYC06020-PA	
Mechanical specification	Travel length		15mm		20mm		
	Table size		40×40mm		60×60mm		
	Feed screw (Ball screw)		φ6 lead 1		φ8 lead 1		
	Guide		Crossed roller guide				
Main materials-Finishing		Aluminum—Black almite finishing					
Weight		0.63kg	0.73kg	0.90kg	1.10kg	0.90kg 1.00kg	
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm	1μm (Set to 1000P/R)	2μm/1μm	1μm/0.5μm	1μm (Set to 1000P/R)
		Microstep	0.1μm (1/20 on resolution)	—	0.1μm (1/20 on resolution)	0.05μm (1/20 on resolution)	—
	MAX speed		10mm/sec		20mm/sec		
	Load capacity		4.5kgf [44.1N]				
Perpendicularity		Within 7.5μm/Full stroke		Within 10μm/Full stroke			
Pitching/Yawing		Within 25"/Within 20"		Within 20"/Within 15"			
Sensor	Limit sensor		Installed				
	Origin sensor		Installed				
	Slit origin sensor		—				
Provided screw (Hexagon-headed bolt)		4 of M3—16		4 of M4—16			
Single-axis accuracy specification	Uni-directional positioning accuracy		Within 10μm		Within 5μm		
	Repeatability positioning accuracy		Within ±0.5μm		Within ±0.3μm		
	Lost motion		Within 1μm				
	Backlash		Within 0.5μm				
	Straightness		Within 3μm				

※ Motor code [C·F·G] not include the cable. Choose the cable from cable code table.

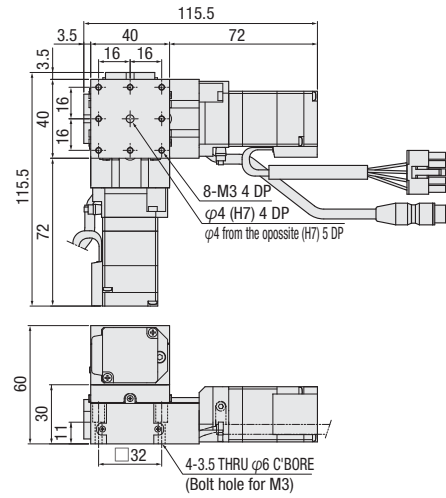
※ Motor code [P] includes the driver, motor and sensor cable.

Dimensional outline drawings

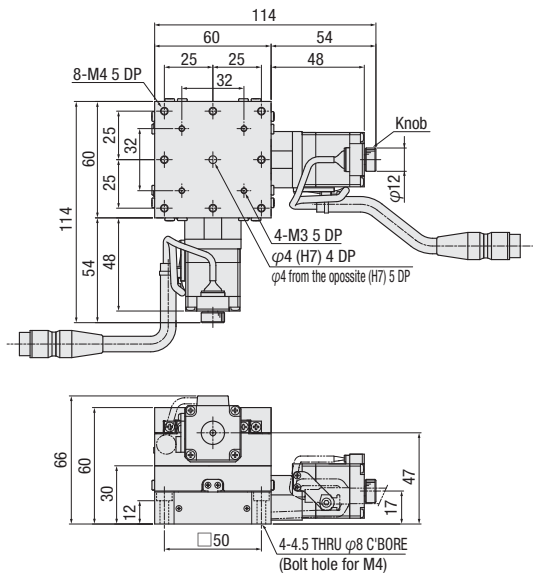
KYC04015-C



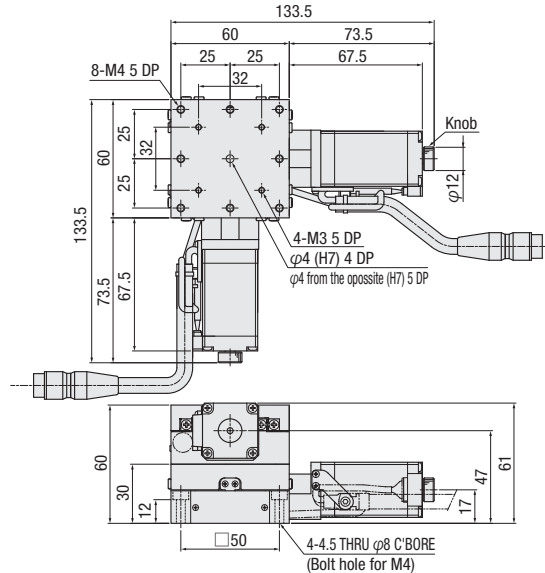
KYC04015-PA



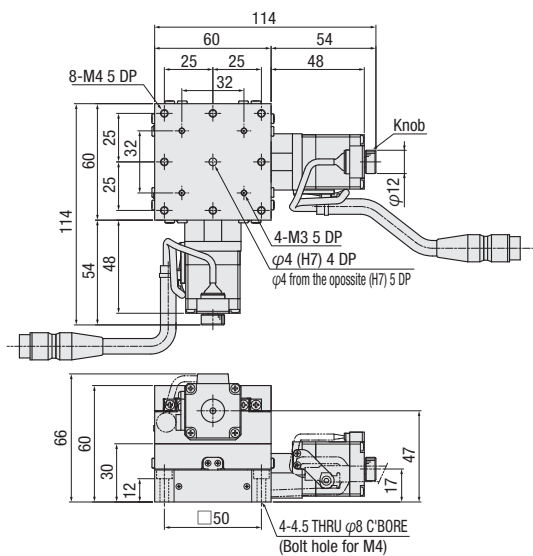
KYC06020-C



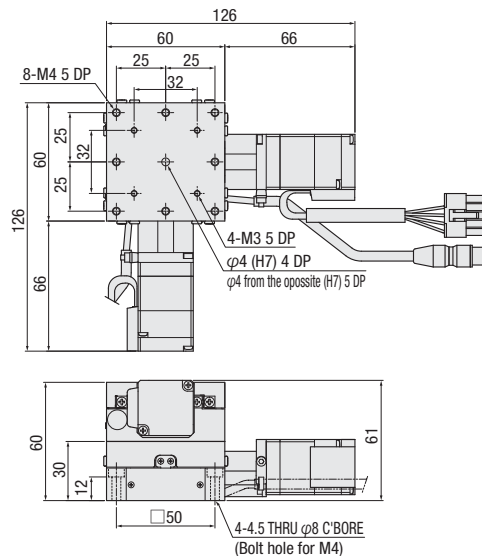
KYC06020-F



KYC06020-G



KYC06020-PA



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

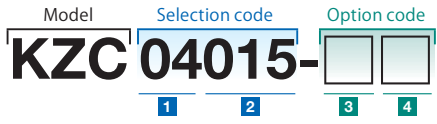
1

086

## Z-axis Cross Roller Guide: KZC04015/KZC06020



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller



🔗 Cable P.1-207~  
🔗 Electrical specification P.1-091~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

\* Not available 04020 and 06015

### 2 Travel length

015	15mm
020	20mm

### 3 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
PA	<input type="checkbox"/> 28 $\alpha$ Step (Driver set)

\* PA can choose only cable code P. Cannot choose the blank.  
\* In case of KXC04, can be chosen only C and PA.

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—
P	Cable for $\alpha$ step 3m	—

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207, 209~ for more cable details.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

- Linear Ball
- CAVE-X Linear ball

- Cross Roller
- Slide Guide

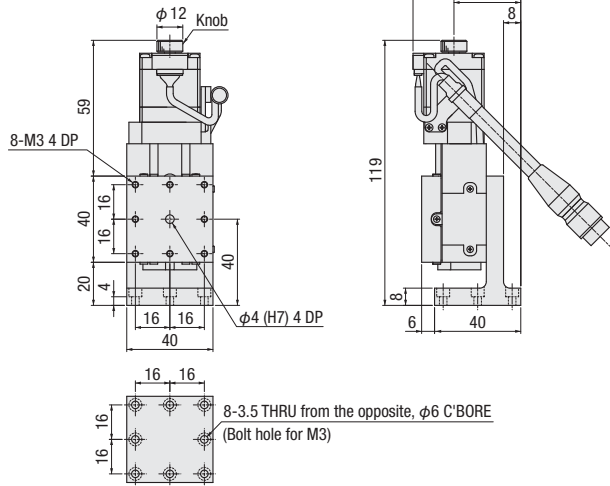
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

SPEC												
Model	KZC04015-C		KZC04015-PA		KZC06020-C		KZC06020-F		KZC06020-G		KZC06020-PA	
Mechanical specification	Travel length	15mm				20mm						
	Table size	40×40mm				60×60mm						
	Feed screw (Ball screw)	φ6 lead 1				φ8 lead 1						
	Guide	Crossed roller guide										
Main materials-Finishing		Aluminum—Black almite finishing										
Weight		0.38kg	0.43kg	0.80kg	0.90kg	0.80kg	0.85kg					
Accuracy specification	Resolution (Pulse)	Full/ Half	2μm/1μm		1μm (Set to 1000P/R)		2μm/1μm		1μm/0.5μm		1μm (Set to 1000P/R)	
		Microstep	0.1μm (1/20 on resolution)		—		0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)		—	
	MAX speed	10mm/sec				20mm/sec						
	Load capacity (Excitation)	3.0kgf [29.4N]										
Pitching/Yawing	Vertical degree	Within 7.5μm/Full stroke				Within 10μm/Full stroke						
	Pitching/Yawing	Within 25"/Within 20"				Within 20"/Within 15"						
	Limit sensor	Installed										
Sensor	Origin sensor	Installed										
	Slit origin sensor	—										
Provided screw (Hexagon-headed bolt)		4 of M3—8				4 of M4—10						
Single axis accuracy specification	Uni-directional positioning accuracy	Within 10μm				Within 5μm						
	Repeatability positioning accuracy	Within ±0.5μm				Within ±0.3μm						
	Lost motion	Within 2μm				Within 1μm						
	Backlash	Within 0.5μm										
	Straightness	Within 3μm										

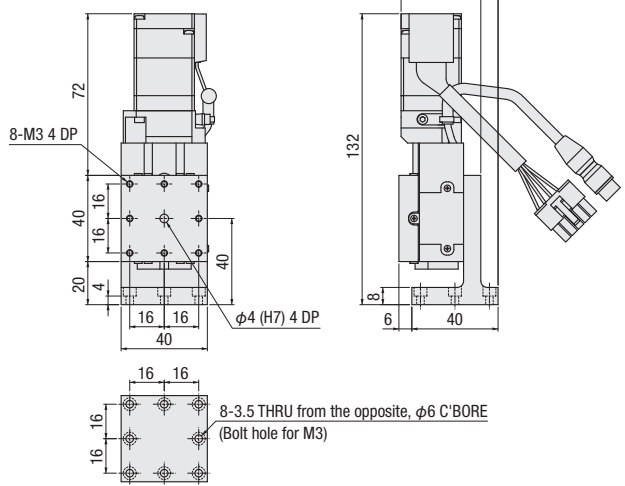
※ Motor code [C·F·G] not include the cable. Choose the cable from cable code table.  
 ※ Motor code [P] includes the driver, motor and sensor cable.

**Dimensional outline drawings**

**KZC04015-C**

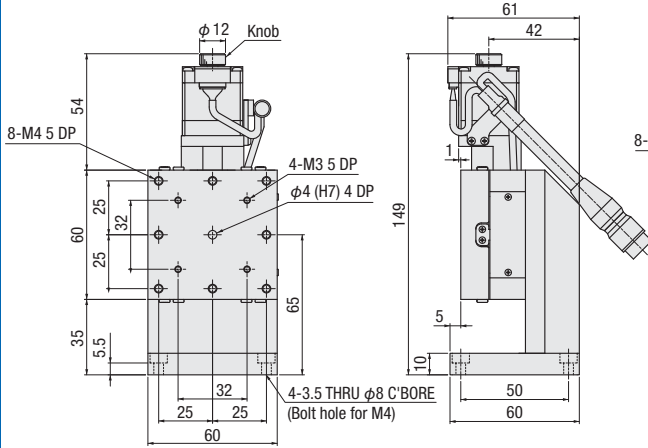


**KZC04015-P**

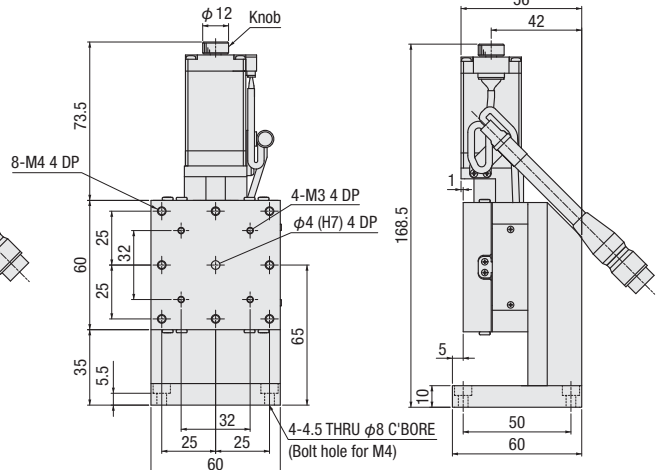


[P]; Please see our web site for more details about motors.

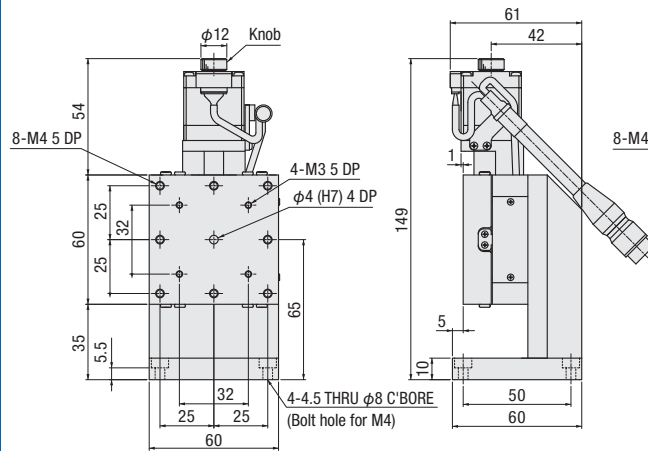
**KZC06020-C**



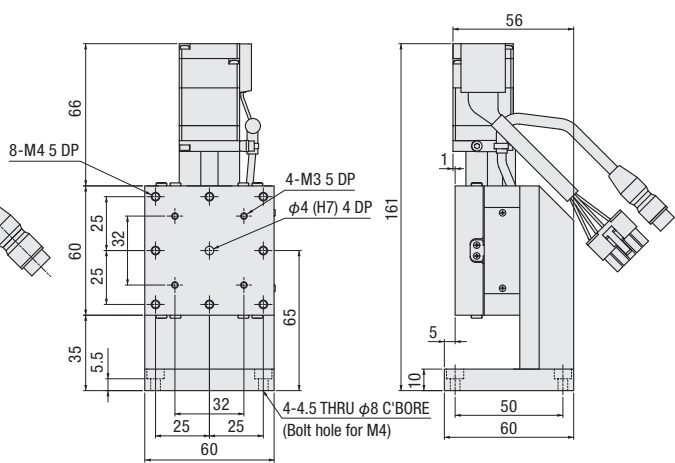
**KZC06020-F**



**KZC06020-G**



**KZC06020-P**

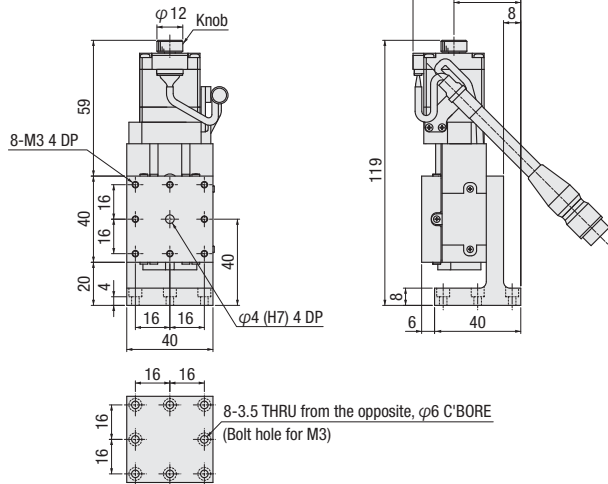


[P]; Please see our web site for more details about motors.

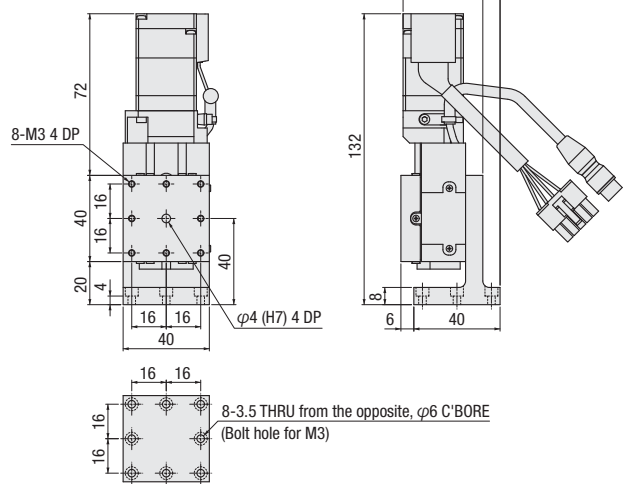
Motorized Stage
X
XY
Z
Horizontal Z
XYZ
Goniometer
Rotary
Unit
Controller
Linear Ball
CAVE-X Linear ball
Cross Roller
Slide Guide
φ40
φ50
φ60
φ70
φ80
φ100
φ120
Other
1
088

**Dimensional outline drawings**

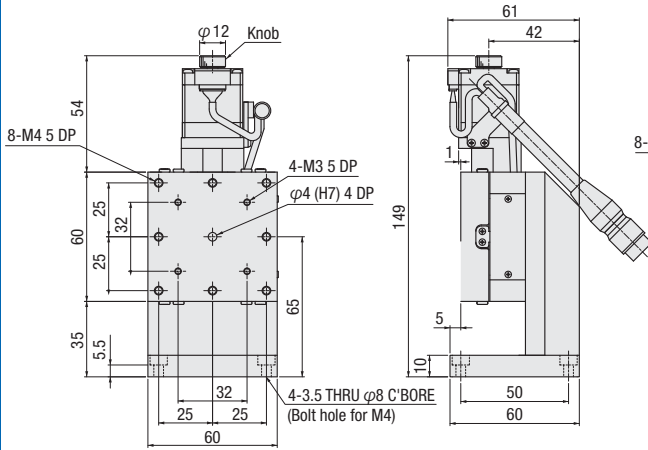
**KZC04015-C**



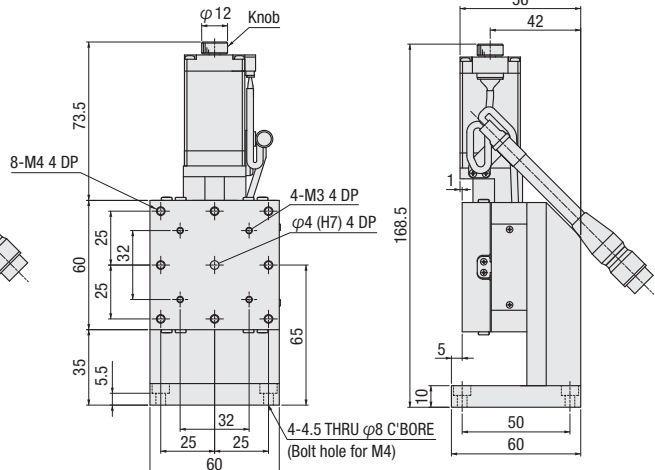
**KZC04015-PA**



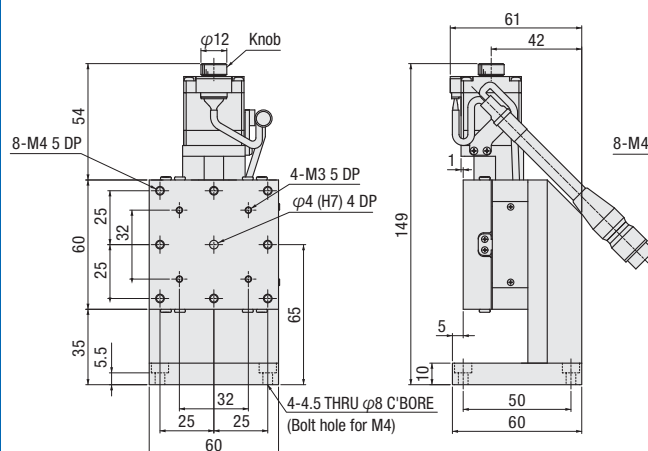
**KZC06020-C**



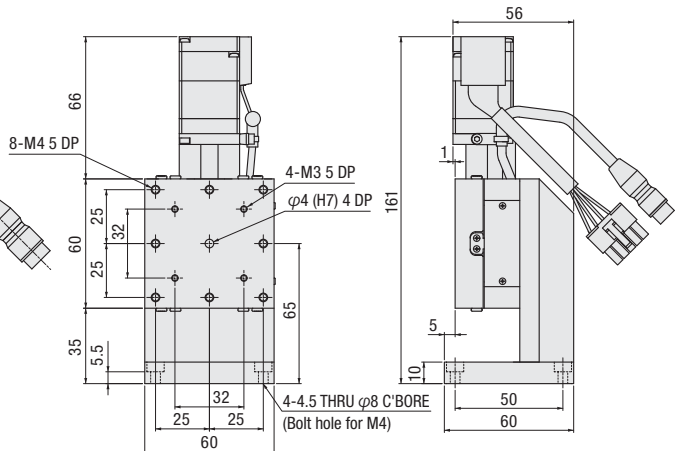
**KZC06020-F**



**KZC06020-G**



**KZC06020-PA**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

## XYZ-axis Cross Roller Guide: KWC04015/KWC06020

RoHS

KWC04015-C



KWC04015-P



KWC06020-LC



KWC06020-LF



KWC06020-LG



KWC06020-LP



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

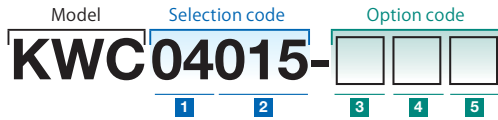
φ70

φ80

φ100

φ120

Other



🔗 Cable P.1-207~  
🔗 Electrical specification P.1-091~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

\* Not available 04020 and 06015

### 2 Travel length

015	15mm
020	20mm

### 3 Sensor cover location specification

L	L Specification
R	R Opposite hand

\*04015 for only L position

### 4 Motor option

Code	Specification
C	Standard
F	High-torque
G	High resolution
PA	<input type="checkbox"/> 28 α Step (Driver set)

\* PA can choose only cable code P. Cannot choose the blank.  
\* In case of KXC04, can be chosen only C and PA.

### 6 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—
P	Cable for α step 3m	—

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207,209~ for cable details.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

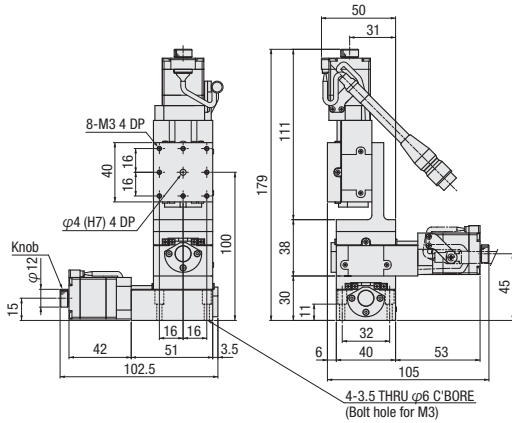
## SPEC

Model	KWC04015-C	KWC04015-PA	KWC06020-LC	KWC06020-LF	KWC06020-LG	KWC06020-LPA	
<b>(Opposite hand)</b>	-		KWC06020-RC	KWC06020-RF	KWC06020-RG	KWC06020-RPA	
Travel length	15mm		20mm				
Table size	40×40mm		60×60mm				
Feed screw (Ball screw)	φ6 lead 1		φ8 lead 1				
Guide	Crossed roller guide						
Main materials-Finishing	Aluminum—Black almite finishing						
Weight	1.03kg	1.45kg	1.98kg	2.00g	1.70kg	1.85kg	
Resolution (Pulse)	Full/Half	2μm/1μm	1μm (Set to 1000P/R)	2μm/1μm		1μm/0.5μm	
	Microstep	0.1μm (1/20 on resolution)	—	0.1μm (1/20 on resolution)	0.05μm (1/20 on resolution)	—	
MAX speed	10mm/sec		20mm/sec				
Load capacity (Excitation)			3.0kgf [29.4N]				
Pitching/Yawing	Within 25" / Within 20"		Within 20" / Within 15"				
Sensor	Limit sensor			Installed			
	Origin sensor			Installed			
	Slit origin sensor			—			
Provided screw (Hexagon-headed bolt)	4 of M3—16		4 of M4—16				
Shaft axis accuracy specification	Uni-directional positioning accuracy	Within 10μm		Within 5μm			
	Repeatability positioning accuracy	Within ±0.5μm		Within ±0.3μm			
	Lost motion			Within 1μm			
	Backlash			Within 0.5μm			
	Straightness			Within 3μm			

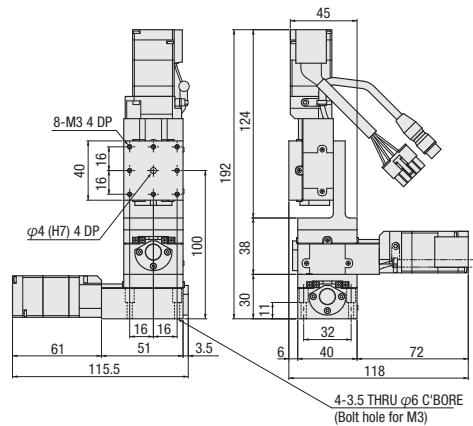
※ Motor code [C·F·G] not include the cable. Choose the cable from cable code table.  
※ Motor code [P] includes the driver, motor and sensor cable.

**Dimensional outline drawings**

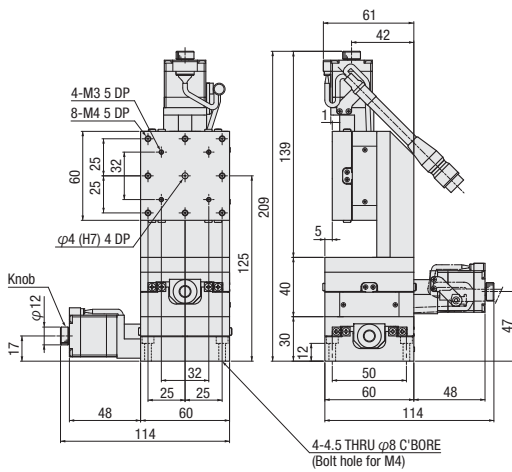
**KWC04015-C**



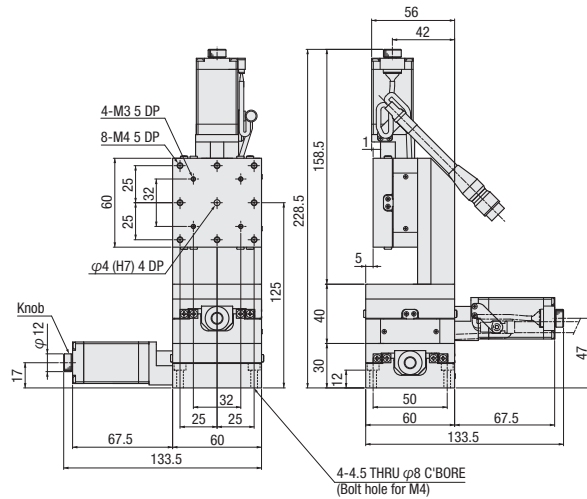
**KWC04015-PA**



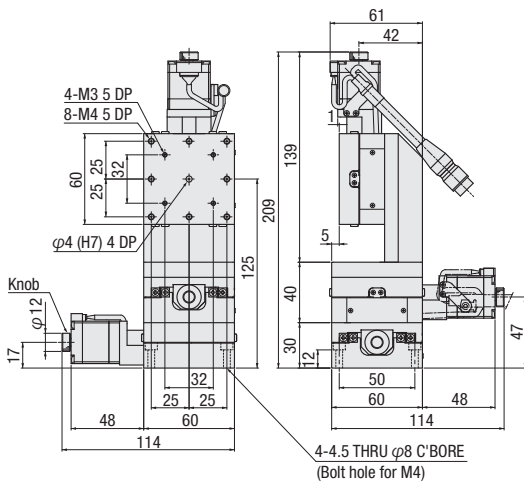
**KWC06020-LC**



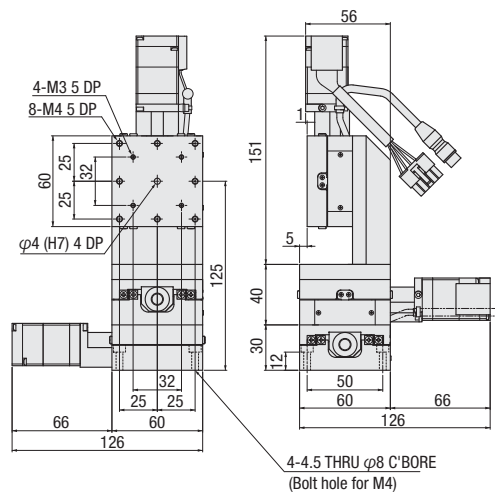
**KWC06020-LF**



**KWC06020-LG**



**KWC06020-LPA**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

090



## Electrical Specification: KXC04015/KXC06020

### Electrical specification

Models		KXC04015-C	KXC06020-C	KXC06020-F	KXC06020-G	KXC04015-P	KXC06020-P	
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase				$\alpha$ step motor		
	Model (*2)	C005C-90215P (□28mm)		PK525HPB-C1 (□28mm)	PK523HPMB-C1 (□28mm)	ARM24SAK (□28mm)		
	Step angle	0.72°			0.36°		0.36° (Set to 1000P/R)	
	Driver type	▶ P.1-205~					ARD-K	
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)				HR10A-7J-6P (73)		
	Contact type	—				—		
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)				HR10A-7P-6S (73)		
	Compatible receiving contact	—				—		
Sensor	Limit sensor	Installed						
	Origin sensor	Installed						
	Slit origin sensor	—						
	Model	Photo microsensor EE-SX4134 (Omuron Co.,Ltd.)						
	Power voltage	DC5~24V ±10%						
	Consumption current	Total 60mA or less						
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA						
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)						

\*1 See page ▶ P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

### Available sensor DC5V~24V.

This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

It used to require the K-PCBA24 when the former products are driven by use of a motion control board or programmable logic controller (PLC) without our controller.

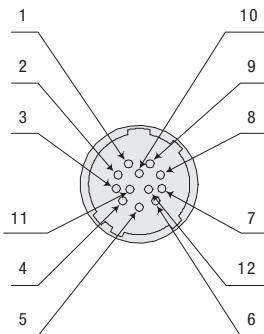
### Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS101-15, -20 and amplifier substrates will be replaced with KXC04 and KXC06 stages.

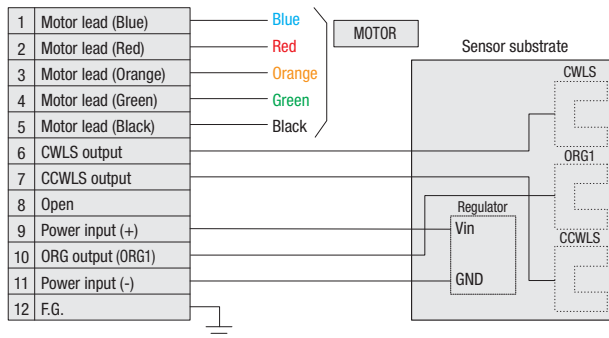
We have avariety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

■ Motor code: C (Standard) • F (High-torque) • G (High resolution)

### Pin allocation (The same)

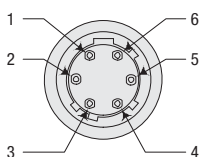


### Connection diagram (The same)

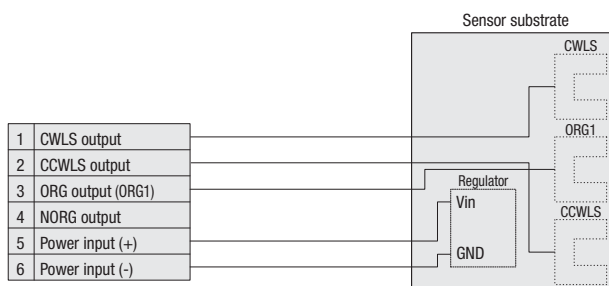


■ Motor code: PA ( $\alpha$  step) Motor cable model : CC030VA2R2 ▶ P.1-211

### Pin allocation (Sensor)



### Connection diagram (Sensor)



※Other side cable specification See page ▶ P.1-212

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

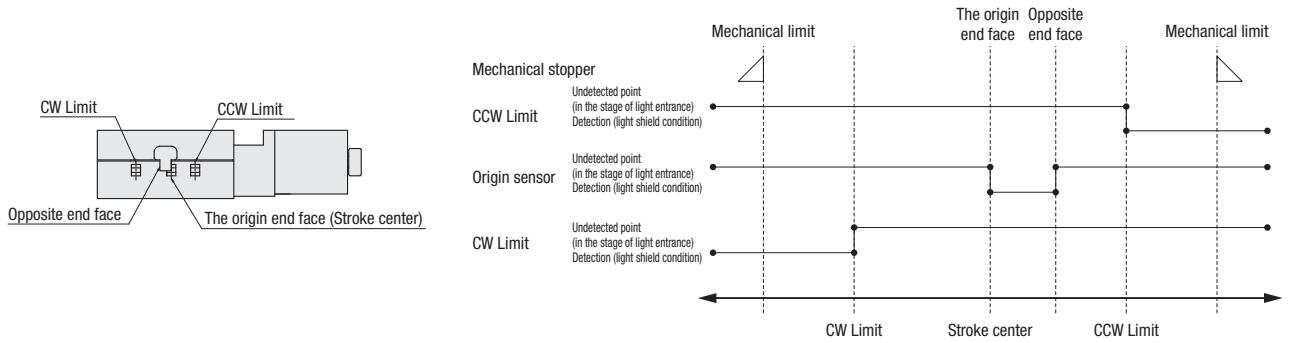
φ80

φ100

φ120

Other

**Timing chart**



Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit	Mechanical limit
<b>KXC04015</b>	Return to origin	8.5	7.7	0	2	7.7	8.5
<b>KXC06020</b>	Return to origin	11	10.5	0	5	10.5	11

\*Return to origin means that is performed return to origin type 4 using DS102/DS112 series.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

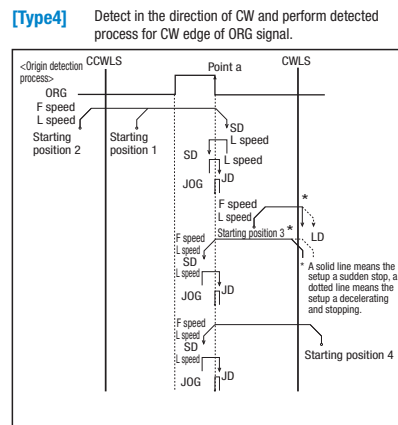
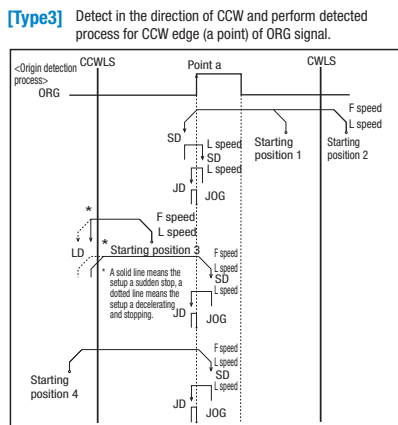
Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
 Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

**Method for return to origin**

Suruga's motorized stages is different from the wire connection as the number of sensors depending on models. It is necessary to choose type to suit correctly as return to origin operation is divided into same types/Selected wrong type may be operated incorrectly. Choose your best one whatever you need according to be recommended as below.

**KXC04015/KXC06020 recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.



**Adaptive driver**

Driver P.1-205~

DC24V type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

Controller P.1-197~

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

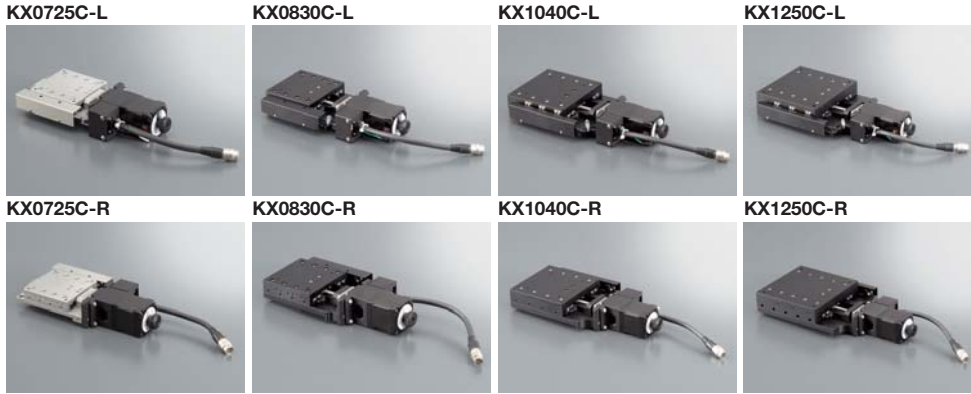
092

# Motorized Stage

## Thin Type X-axis Cross Roller Guide: KX0725C/KX0830C/KX1040C/KX1250C

Motorized Stage

RoHS



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Model Selection code Option code

**K** **X0725C-L** **5**

1 2 3 4 5 6

Cable P.1-207~  
Electrical specification P.1-099~

### 1 Axis

X	X-axis
---	--------

### 2 Table size

07	<input type="checkbox"/> 70mm
08	<input type="checkbox"/> 80mm
10	<input type="checkbox"/> 100mm
12	<input type="checkbox"/> 120mm

### 3 Travel length

25	25mm
30	30mm
40	40mm
50	50mm

\* Selectable only 0725, 0830, 1040, 1250 in combination with 2 and 3.

### 4 Guide

C	Crossed roller
---	----------------

### 5 Sensor cover location specification

L	L position
R	Opposite hand

### 6 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207, 209~ for more cable details.  
\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

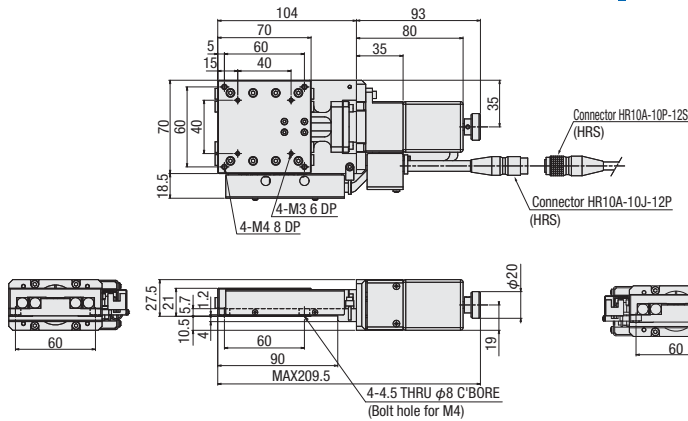
Other

### SPEC

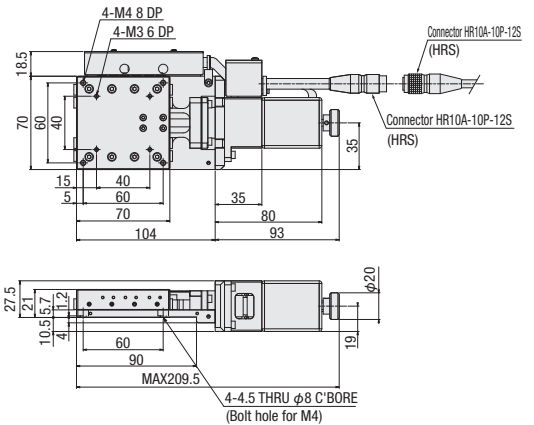
Model	KX0725C-L5	KX0830C-L5	KX1040C-L5	KX1250C-L5
(Opposite hand)	KX0725C-R5	KX0830C-R5	KX1040C-R5	KX1250C-R5
Travel length	25mm	30mm	40mm	50mm
Table size	70×70mm	80×80mm	100×100mm	120×120mm
Feed screw	Ball screwφ6 lead 1			
Guide	Crossed roller guide			
Main materials-Finishing	Aluminum—White almitine finish		Aluminum—Black almitine finishing	
Weight	1.0kg	1.2kg	1.6kg	2.2kg
Resolution (Pulse)	Full/Half Microstep 1μm/0.5μm 0.05μm (1/20 on resolution)			
MAX speed	10mm/sec			
Uni-directional positioning accuracy	Within 5μm			
Repeatability positioning accuracy	Within ±0.3μm			
Load capacity	10kgf [98N]	15kgf [147N]	20kgf [196N]	25kgf [245N]
Moment stiffness	Pitch 0.09/yaw 0.07/roll 0.07 [°/N · cm]	Pitch 0.05/yaw 0.04/roll 0.03 [°/N · cm]	Pitch 0.04/yaw 0.04/roll 0.02 [°/N · cm]	Pitch 0.03/yaw 0.02/roll 0.02 [°/N · cm]
Lost motion	Within 1μm			
Backlash	Within 0.5μm			
Straightness	Within 1μm			
Parallelism	Within 30μm			
Motion parallelism	Within 10μm		Within 15μm	
Pitching/Yawing	Within 20°/Within 15°			
Limit sensor	Installed			
Origin sensor	Installed			
Slit origin sensor	Installed			
Provided screw (Hexagon-headed bolt)	4 of M4—8		4 of M4—10	
			4 of M6—10	

Dimensional outline drawings

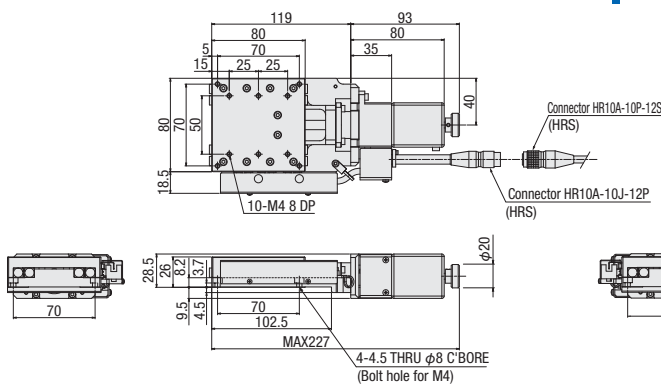
KX0725C-L



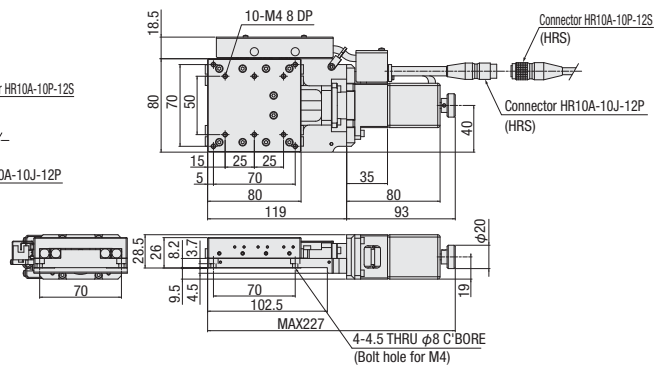
KX0725C-R



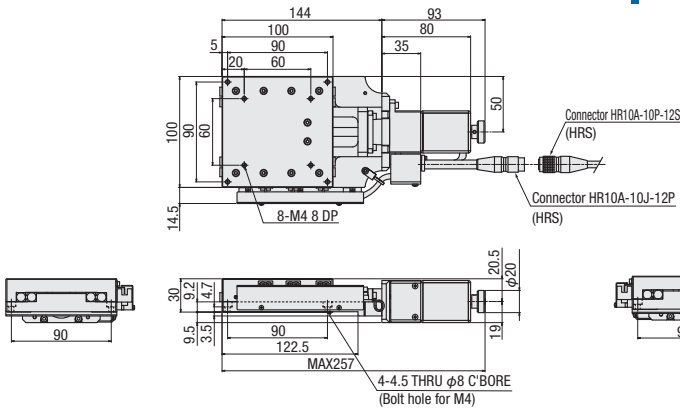
KX0830C-L



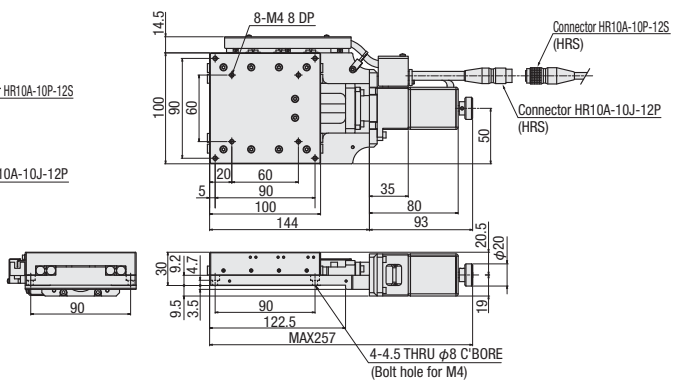
KX0830C-R



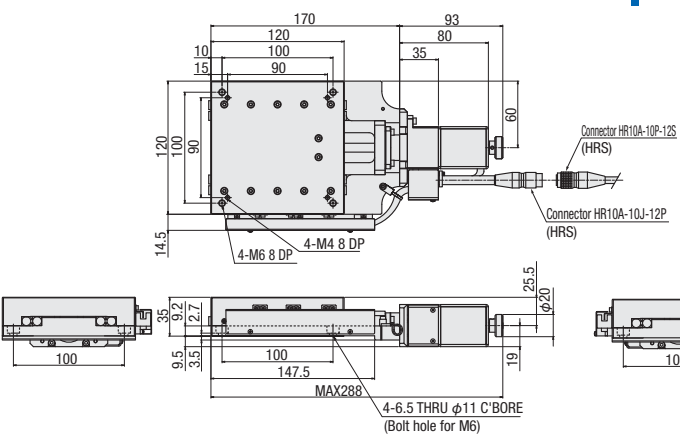
KX1040C-L



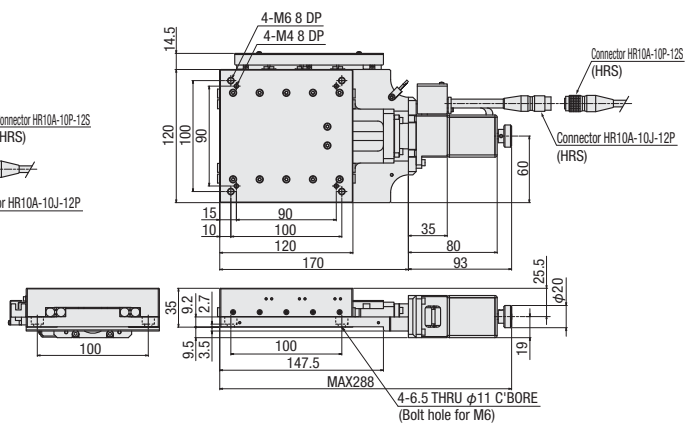
KX1040C-R



KX1250C-L



KX1250C-R



Motorized Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

# Motorized Stage

## Thin Type XY-axis Cross Roller Guide: KY0725C/KY0830C/KY1040C/KY1250C

Motorized Stage

RoHS

KY0725C-L



KY0830C-L



KY1040C-L



KY1250C-L



KY0725C-R



KY0830C-R



KY1040C-R



KY1250C-R



Model Selection code Option code  
**K** **Y0725C-L** **5**  
 1 2 3 4 5 6

🔗 Cable P.1-207~  
 ⚙️ Electrical specification P.1-099~

### 1 Axis

Y	XY-axis
---	---------

### 2 Table size

07	<input type="checkbox"/> 70mm
08	<input type="checkbox"/> 80mm
10	<input type="checkbox"/> 100mm
12	<input type="checkbox"/> 120mm

### 3 Travel length

25	25mm
30	30mm
40	40mm
50	50mm

\* Selectable only 0725, 0830, 1040, 1250 in combination with 2 and 3.

### 4 Guide

C	Crossed roller
---	----------------

### 5 Sensor cover location specification

L	L position
R	Opposite hand

### 6 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.  
 \* If you choose the option specification, please add the difference to standard price.  
 \* See page P.1-207, 209~ for more cable details.  
 \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

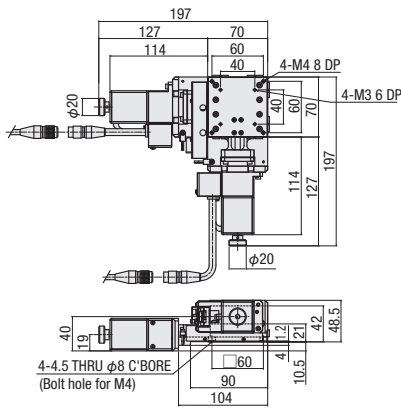
Other

1  
095

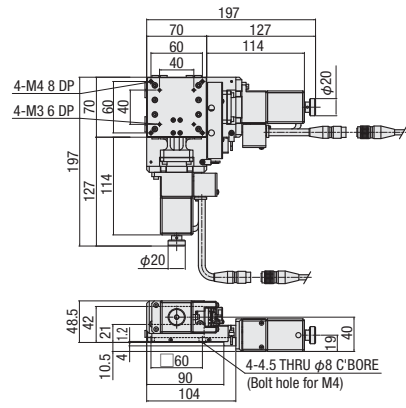
		SPEC			
Model		KY0725C-L5	KY0830C-L5	KY1040C-L5	KY1250C-L5
(Opposite hand)		KY0725C-R5	KY0830C-R5	KY1040C-R5	KY1250C-R5
Mechanical specification	Travel length	25mm	30mm	40mm	50mm
	Table size	70×70mm	80×80mm	100×100mm	120×120mm
	Feed screw	Ball screw φ6 lead 1		Ball screw φ8 lead 1	
	Guide	Crossed roller guide			
Main materials-Finishing		Aluminum—White almite finish		Aluminum—Black almite finishing	
Weight		2.0kg	2.4kg	3.2kg	4.4kg
Accuracy specification	Resolution (Pulse)	1μm/0.5μm			
		0.05μm (1/20 on resolution)			
	MAX speed	10mm/sec			
Sensor	Load capacity	10kgf [98N]	15kgf [147N]	20kgf [196N]	25kgf [245N]
	Perpendicularity	Within 30μm/Full stroke			
	Limit sensor	Installed			
	Origin sensor	Installed			
Slit origin sensor		Installed			
Provided screw (Hexagon-headed bolt)		4 of M4—8		4 of M4—10	4 of M6—10
Stage accuracy specification	Uni-directional positioning accuracy	Within 5μm			
	Repeatability positioning accuracy	Within ±0.3μm			
	Lost motion	Within 1μm			
	Backlash	Within 0.5μm			
	Straightness	Within 1μm			
Pitching/Yawing		Within 20"/Within 15"			

Dimensional outline drawings

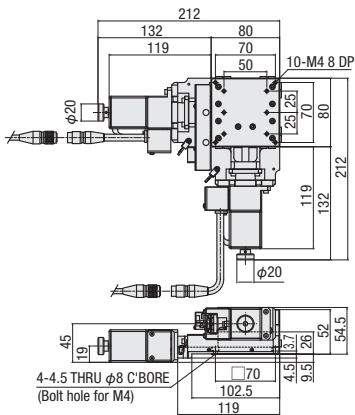
**KY0725C-L**



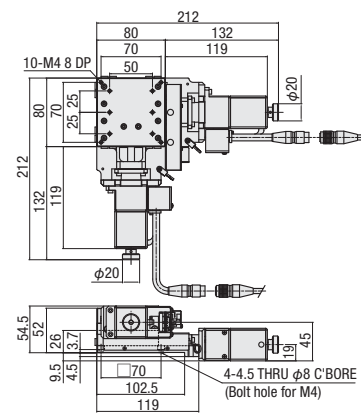
**KY0725C-R**



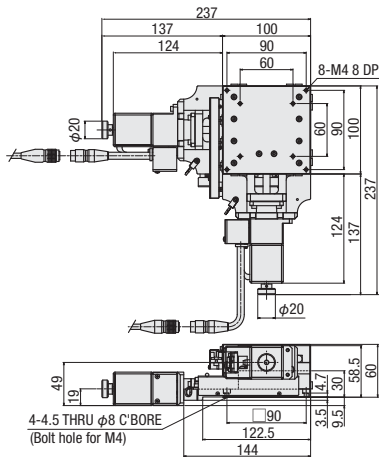
**KY0830C-L**



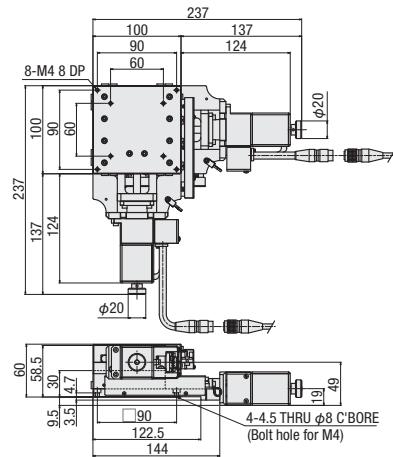
**KY0830C-R**



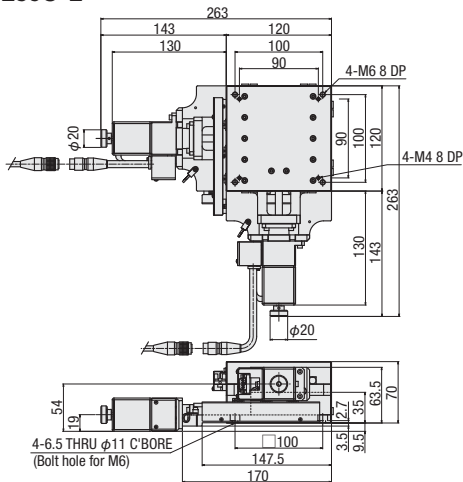
**KY1040C-L**



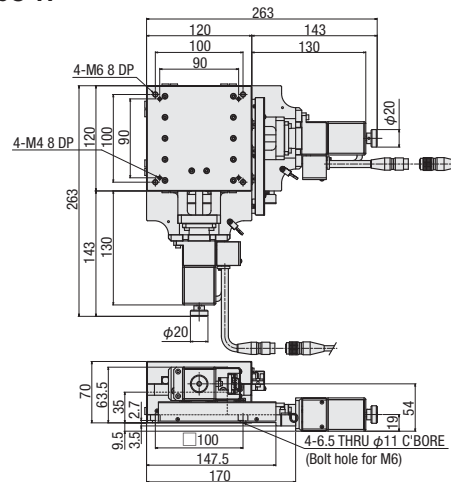
**KY1040C-R**



**KY1250C-L**



**KY1250C-R**



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

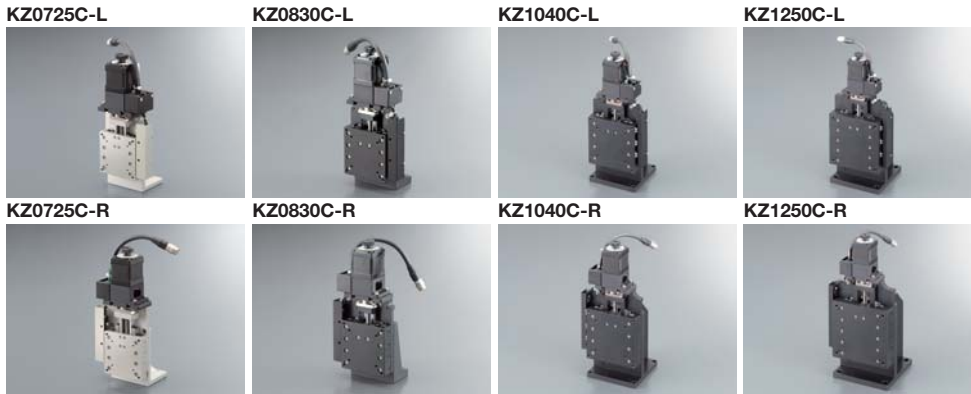
Other

# Motorized Stage

## Thin Type Z-axis Cross Roller Guide: KZ0725C/KZ0830C/KZ1040C/KZ1250C

Motorized Stage

RoHS



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Model Selection code Option code

**K** **Z0725C-L** **5**

1 2 3 4 5 6

▶ Cable P.1-207~  
▶ Electrical specification P.1-099~

### 1 Axis

Z	Z-axis
---	--------

### 2 Table size

07	<input type="checkbox"/> 70mm
08	<input type="checkbox"/> 80mm
10	<input type="checkbox"/> 100mm
12	<input type="checkbox"/> 120mm

### 3 Travel length

25	25mm
30	30mm
40	40mm
50	50mm

\* Selectable only 0725, 0830, 1040, 1250 in combination with **2** and **3**.

### 4 Guide

C	Crossed roller
---	----------------

### 5 Sensor cover location specification

L	L position
R	Opposite hand

### 6 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.

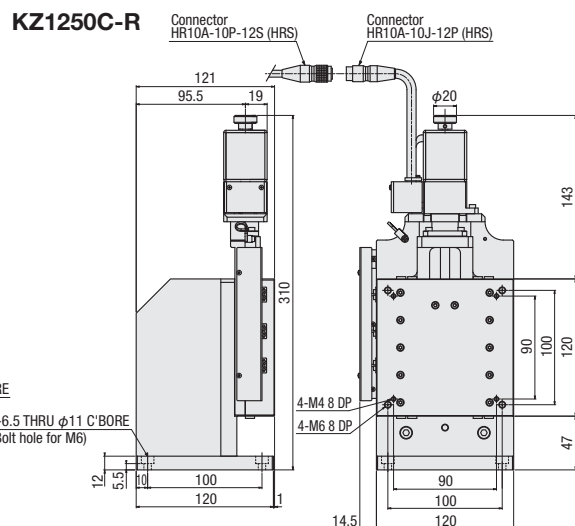
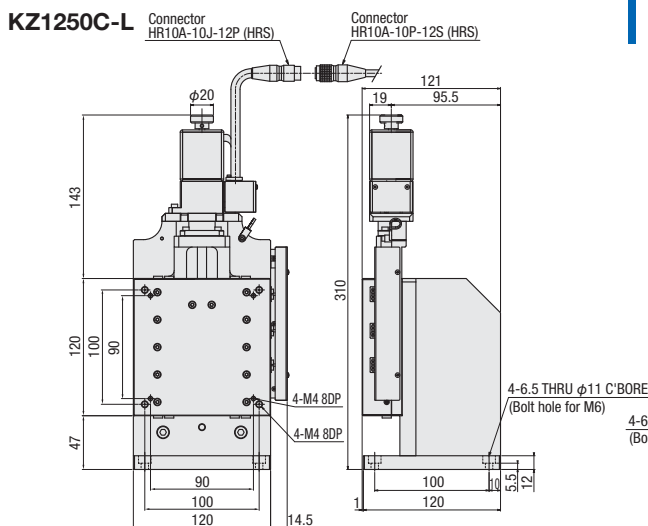
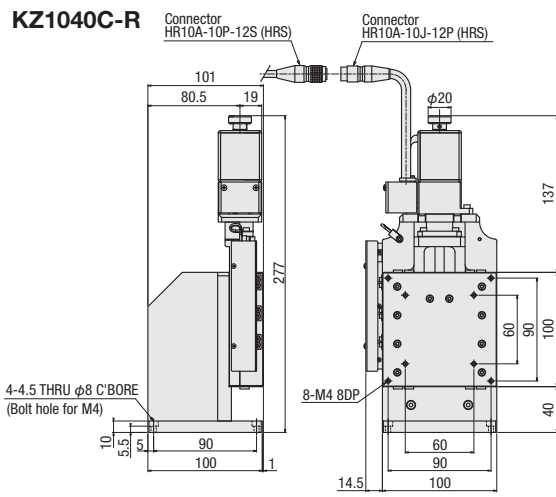
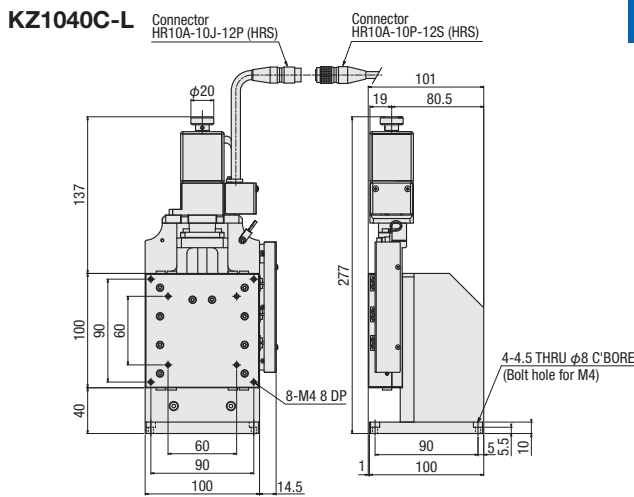
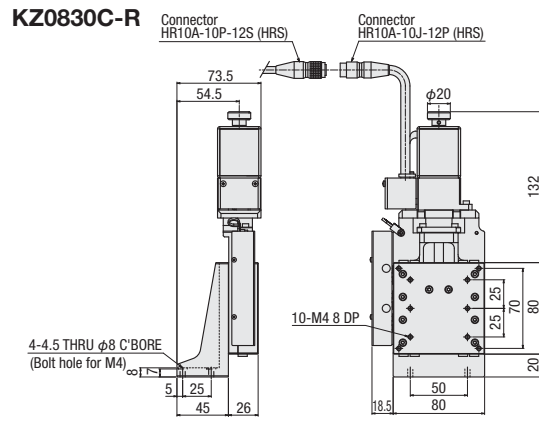
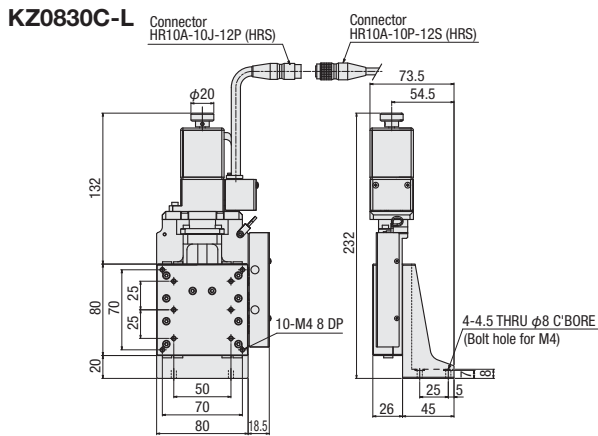
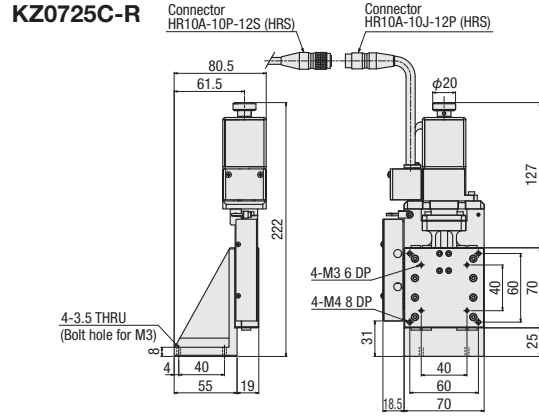
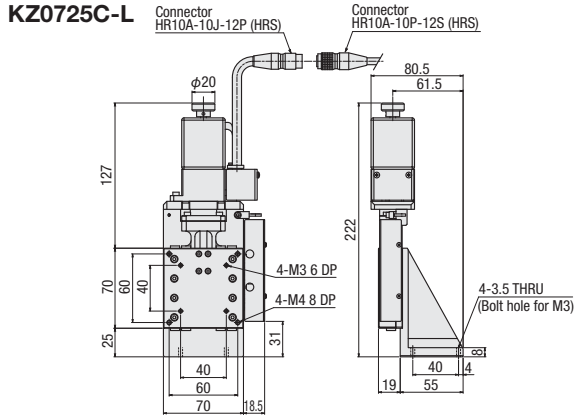
\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for more cable details.

\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

		SPEC			
Model		KZ0725C-L5	KZ0830C-L5	KZ1040C-L5	KZ1250C-L5
<b>(Opposite hand)</b>		<b>KZ0725C-R5</b>	<b>KZ0830C-R5</b>	<b>KZ1040C-R5</b>	<b>KZ1250C-R5</b>
Mechanical specification	Travel length	25mm	30mm	40mm	50mm
	Table size	70×70mm	80×80mm	100×100mm	120×120mm
	Feed screw	Ball screw φ6 lead 1			
	Guide	Crossed roller guide			
Main materials-Finishing		Aluminum—White almite finish		Aluminum—Black almite finishing	
Weight		1.3kg	1.49kg	2.7kg	4.0kg
Accuracy specification	Resolution (Pulse)	Full/Half	1μm/0.5μm		
		Microstep	0.05μm (1/20 on resolution)		
	MAX speed	10mm/sec			
	Load capacity (Excitation)	5kgf [49N]	7.5kgf [73.5N]		
	Vertical degree	Within 20μm	Within 25μm	Within 30μm	Within 40μm
	Pitching/Yawing	Within 20"/Within 15"			
	Uni-directional positioning accuracy	Within 15μm			
	Repeatability positioning accuracy	Within ±0.3μm			
Sensor	Lost motion	Within 1μm			
	Straightness	Within 2μm			
	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	Installed			
Provided screw (Hexagon-headed bolt)		4 of M3—12	4 of M4—12	4 of M4—10	4 of M6—12

**Dimensional outline drawings**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other



# Motorized Stage

## Electrical Specification: KX0725C/KX0830C/KX1040C/KX1250C

Motorized Stage

### Electrical specification

Models		KX0725C	KX0830C	KX1040C	KX1250C
Motor(*1)	Type	5 phase stepping motor 0.75A/Phase(Oriental Motor Co.,Ltd.)			
	Model (*2)	C7214-9015-1 (□38mm)			
	Step angle	0.36°			
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)			
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)			
Sensor	Limit sensor	Installed			
	Slit origin sensor (ORG2)	Installed			
	Origin sensor (ORG1)	Installed			
	Model	Photo microsensor PM-L24 (Panasonic Industrial Devices SUNX)			
	Power voltage	DC5~24V ±10%			
	Consumption current	60mA or less (15mA or less per 1 sensor)			
	Control output	NPN open collector output DC30V or less/50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA			
Output logic (*)	Limit・ORG1: On detection (light shield condition): Output transistor OFF (Non-continuity) ORG2: On detection (light shield condition) : Output transistor OFF (Non-continuity)				

\*KX series, the origin sensor switchable output logic. (The output logic was set at the shipping)

Dip switch of logic swithing plate will be set as below.

The dip switch 1 and 2 is used for logic setting of origin sensor ORG1.

{ On detection (light shield condition): Output transistor OFF (Non-continuity): 1=ON,2=OFF  
On detection (light shield condition): Output transistor ON (Continuity): 1=OFF,2=ON

Dip switch No.3 and 4 is used by setting a logic of the slit origin sensor ORG2.

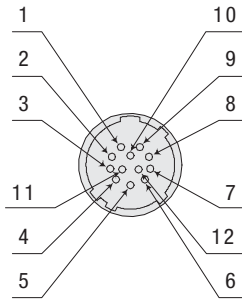
{ Output transistor ON when the detection (light entrance) (Continuity): 3=ON,4=OFF  
OFF (Non-continuity): 3=OFF,4=ON

\*1 See page P.1-213~ for details of single motor specification

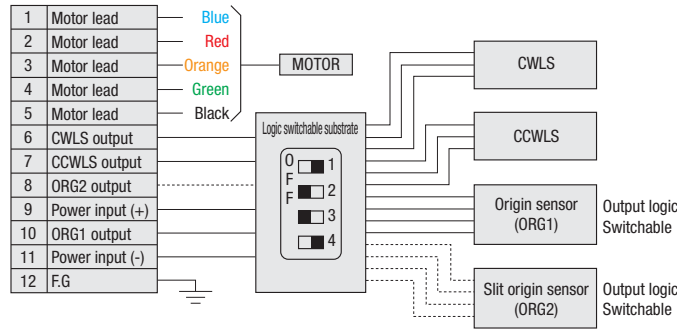
\*2 Motor model is our own management model.

\* The electric specification of XY(PMG), Z(PZG) are the same.

### Pin allocation



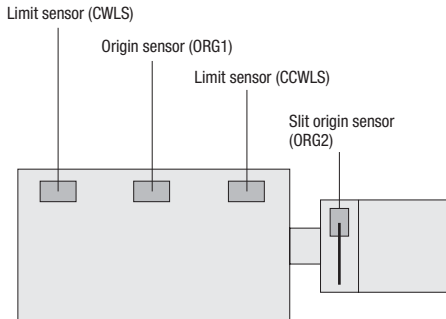
### Connection diagram



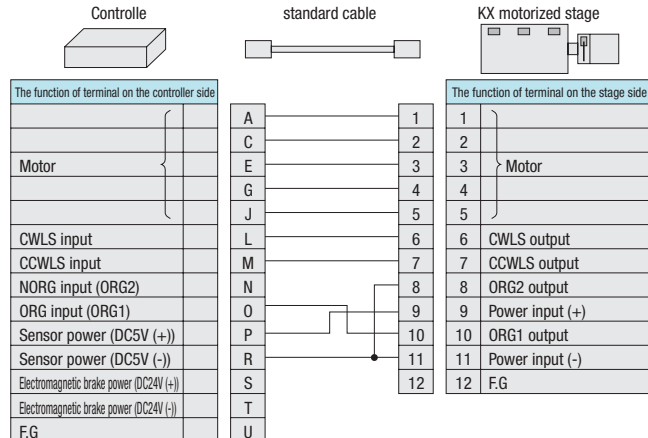
\*Broken line area does not work when use standard cable

### Built-in sensor

■ KX series has built-in sensors such as below.



■ The connecting diagram that connected to our controller using standard attached cable is shown as below.



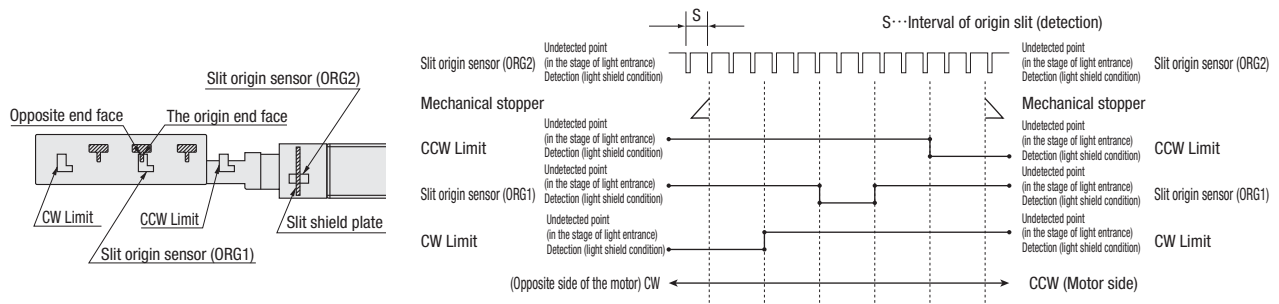
The CWLS (pin#6) and CCWLS (pin#7) on the motorized stage side are connected to CWLS (Lpin) and CCWLS (Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a result, return to origin should be done without the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

● Available the correspondence cable for a slit origin sensor (ORG2)! \* See page P.1-207 for details.

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors. Also please note that the type is different from recommendation return to origin.

When use all of 4 sensors, please select the cable for 4 sensors from page P.1-207~.

**Timing chart**



Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	Origin	Opposite end face	CCW Limit	Mechanical limit
<b>KX0725C</b>	Return to origin	15	13.3	0	2	13.3	15
<b>KX0830C</b>	Return to origin	17.5	15.8	0	2	15.8	17.5
<b>KX1040C</b>	Return to origin	22.5	20.8	0	2	20.8	22.5
<b>KX1250C</b>	Return to origin	27.5	25.8	0	2	25.8	27.5
The same		Detection clearance of slit origin S=1					

\*Return to origin means that is performed return to origin Type 4 using DS102/DS112 series.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

**Method for return to origin**

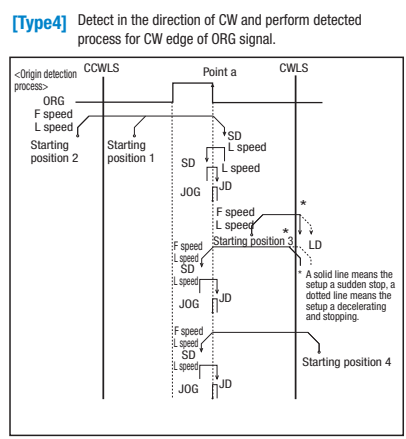
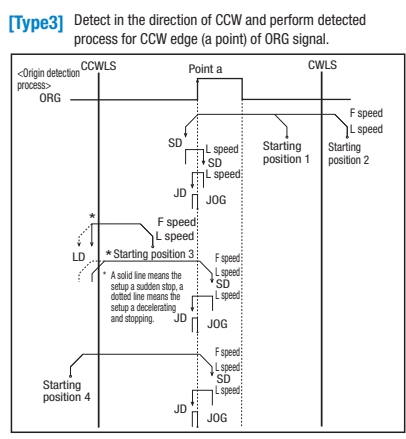
Suruga's motorized stages is different from the sensor specifications depends on models. As return to origin operation is divided into types, it is necessary to choose the correct type. Selected wrong type may be operated uncorrectly. Choose your best one whatever you need according to be recommended as below.

**KX0725C/KX0830C/KX1040C/KX1250C recommended return to origin** **Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

**Select return to origin type from the followings when use the slit origin sensor (ORG2).**

- Type 1: Detect in the direction of CCW and perform detected process for CW edge (point a) of NORG signal. Next detect an edge of CCW side (point b) of ORG signal.
- Type 2: Detect in the direction of CW and perform detected process for CCW edge of NORG signal. Next detect on edge of CW side (point b) of ORG signal.
- Type 7: After finished type1, perform detected process for CCW edge of TIMING signal.
- Type 8: After finished type2, perform detected process for CW edge of TIMING signal.



**Adaptive driver**

**Driver** P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller** P.1-197~

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102

## X-axis Cross Roller Guide: KS101-30

KS101-30LC



KS101-30LMS



KS101-30LQN



Model Selection code Option code

**KS101-30L C-5**

1 2 3 4 5

[Cable P.1-207~](#)  
[Electrical specification P.1-107~](#)

**1** Axis

Code	Specification
1	X-axis

**3** Sensor cover location

Code	Specification
L	L position
R	Opposite hand

**4** Motor option

Code	Specification
C	Standard
MS	<input type="checkbox"/> 38Microstep
PA	<input type="checkbox"/> 28 $\alpha$ step
QA	<input type="checkbox"/> 42 $\alpha$ step

\* Must be chosen the cable from 2A~5R for PA and QA.

**5** Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK
2A	2m ( $\alpha$ step)	—
5A	5m ( $\alpha$ step)	—
2R	Robot cable 2m ( $\alpha$ step)	—
5R	Robot cable 5m ( $\alpha$ step)	—

\* One end loose position to only stage opposite side.  
 \* If you choose the option specification, please add the difference to standard price.  
 \* See page [P.1-207, 209~](#) for more cable details.  
 \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

**2** Travel

30	30mm
----	------

		SPEC			
Model		KS101-30LC-5	KS101-30LMS-5	KS101-30LPA	KS101-30LQA
(Opposite hand)		KS101-30RC-5	KS101-30RMS-5	KS101-30RPA	KS101-30RQA
Mechanical specification	Travel length	30mm			
	Table size	60×70mm			
	Feed screw	Ball screw $\phi$ 8 lead 1			
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum—Black almite finishing			
Weight		0.56kg	0.74kg	0.61kg	0.96kg
	Resolution (Pulse)	Full/ Half 2 $\mu$ m/1 $\mu$ m	1 $\mu$ m/0.5 $\mu$ m	1 $\mu$ m (Set to 1000P/R)	
Accuracy specification	MAX speed	20mm/sec	10mm/sec	20mm/sec	
	Uni-directional positioning accuracy	Within 5 $\mu$ m			
	Repeatability positioning accuracy	Within $\pm$ 0.3 $\mu$ m			
	Load capacity	5.0kgf [49N]			
	Moment stiffness	Pitch 0.15/yaw 0.08/roll 0.07 ["/N·cm]			
	Lost motion	Within 1 $\mu$ m			
	Backlash	Within 0.5 $\mu$ m			
	Straightness	Within 3 $\mu$ m			
	Parallelism	Within 30 $\mu$ m			
	Motion parallelism	Within 10 $\mu$ m			
Pitching/Yawing	Within 25"/Within 20"				
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	—			
Provided screw (Hexagon-headed bolt)		4 of M4—16			

\* The price includes a driver for  $\alpha$  step. Motor cable sold separately. Please order from cable option 2A,5A,2R and 5R. Sensor cable attached only receiving conector. See page [P.1-107~](#).  
 \* The controller for  $\alpha$  step drive is not supplied.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

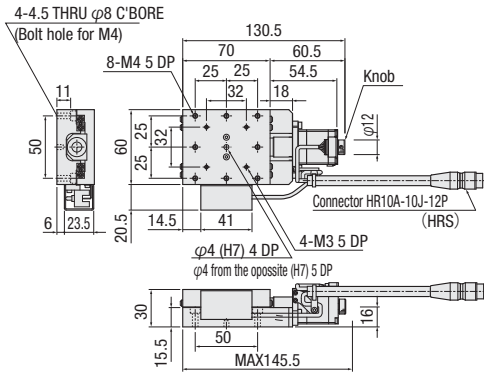
$\phi$ 100

$\phi$ 120

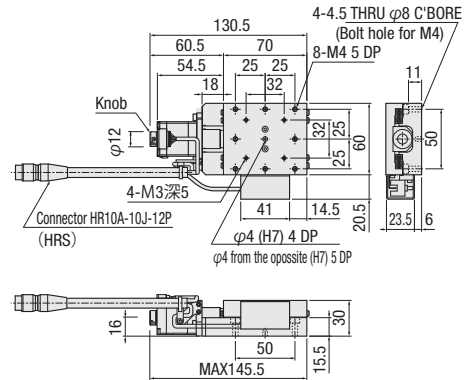
Other

Dimensional outline drawings

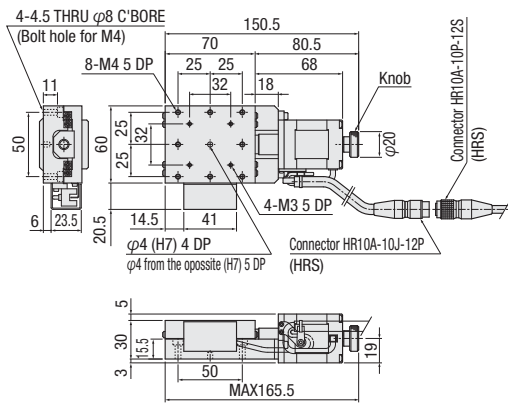
KS101-30LC



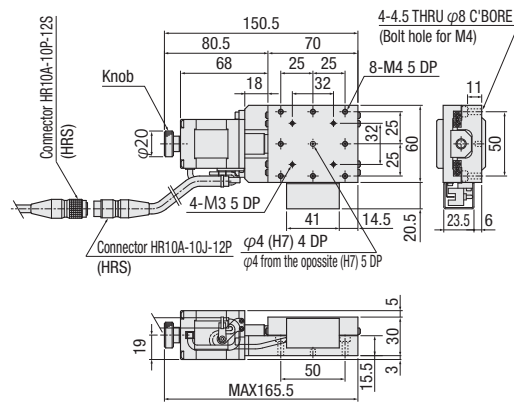
KS101-30RC



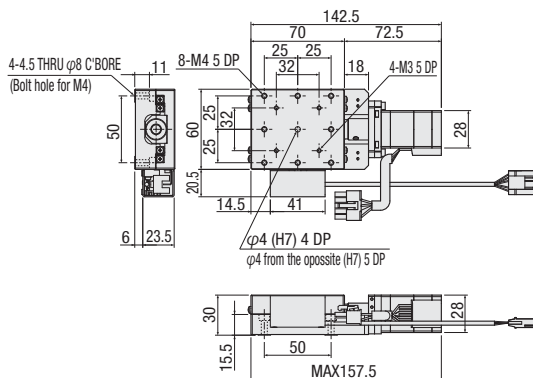
KS101-30LMS



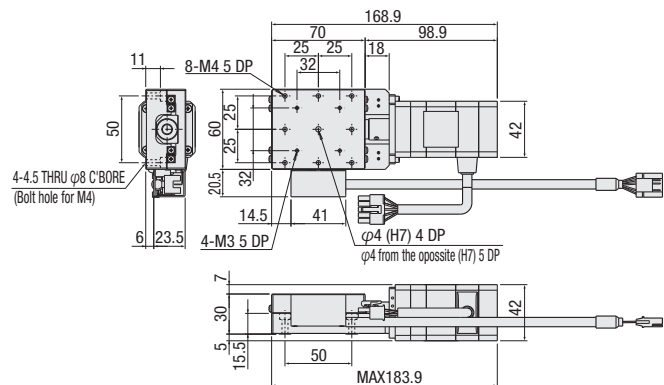
KS101-30RMS



KS101-30LPA



KS101-30LQA



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

102

## XY-axis Cross Roller Guide: KS201-30

KS201-30LC



KS201-30LMS



KS201-30RC



KS201-30RMS



Model Selection code Option code  
**KS 201-30LC - 5**

1 2 3 4 5

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-107~

**1 Axis**

2	XY-axis
---	---------

**2 Travel**

30	30mm
----	------

**3 Sensor cover location specification**

Code	Specification
L	L position
R	Opposite hand

**4 Motor option**

C	Standard
MS	<input type="checkbox"/> 38 Microstep

**5 Cable option**

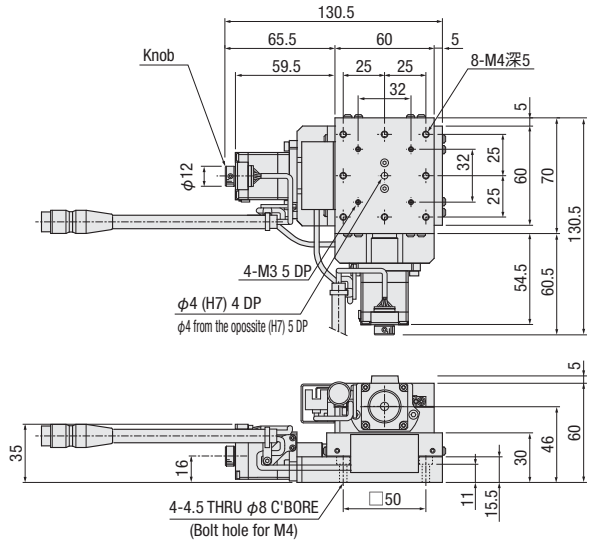
Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.  
 \* If you choose the option specification, please add the difference to standard price.  
 \* See page ▶ P.1-207, 209~ for more cable details.  
 \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

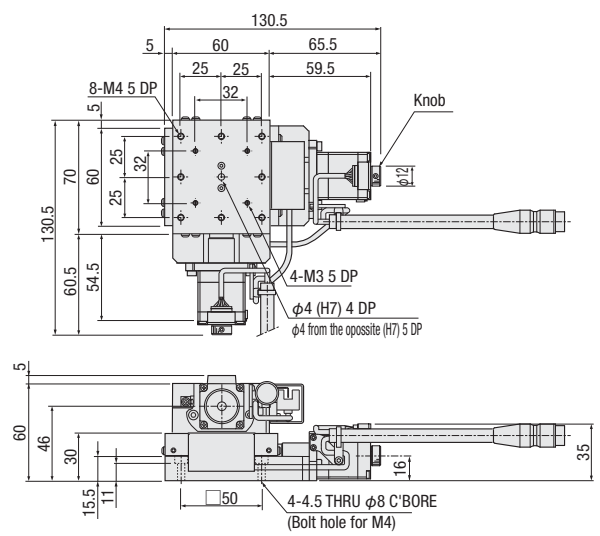
			SPEC	
Model			KS201-30LC-5	KS201-30LMS-5
(Opposite hand)			KS201-30RC-5	KS201-30RMS-5
Mechanical specification	Travel length		30mm	
	Table size		60×70mm	
	Feed screw		Ball screwφ8 lead 1	
	Guide		Crossed roller guide	
	Main materials-Finishing		Aluminum—Black almite finishing	
Accuracy specification	Weight		1.12kg	1.5kg
	Resolution (Pulse)	Full/Half	2μm/1μm	1μm/0.5μm
		Microstep	—	0.05μm (1/20 on resolution)
	MAX speed		20mm/sec	10mm/sec
	Load capacity		4.5kgf [44.1N]	
Sensor	Perpendicularity		Within 15μm/Full stroke	
	Pitching/Yawing		Within 25°/Within 20°	
	Limit sensor		Installed	
	Origin sensor		Installed	
	Slit origin sensor		—	
Provided screw (Hexagon-headed bolt)			4 of M4—16	
Synthetic accuracy specification	Uni-directional positioning accuracy		Within 5μm	
	Repeatability positioning accuracy		Within ±0.3μm	
	Lost motion		Within 1μm	
	Backlash		Within 0.5μm	
	Straightness		Within 3μm	

Dimensional outline drawings

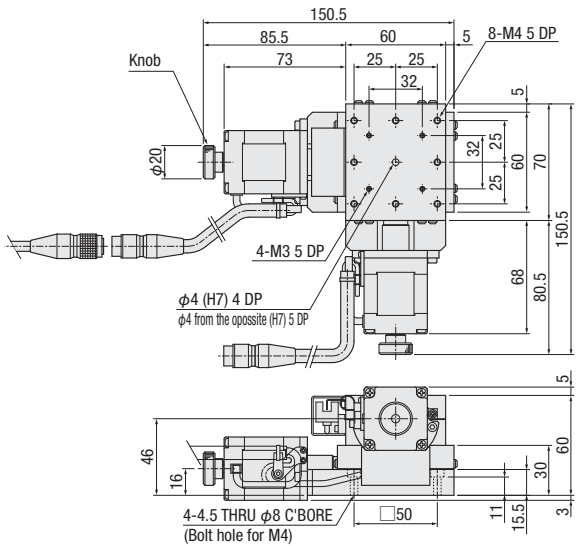
**KS201-30LC**



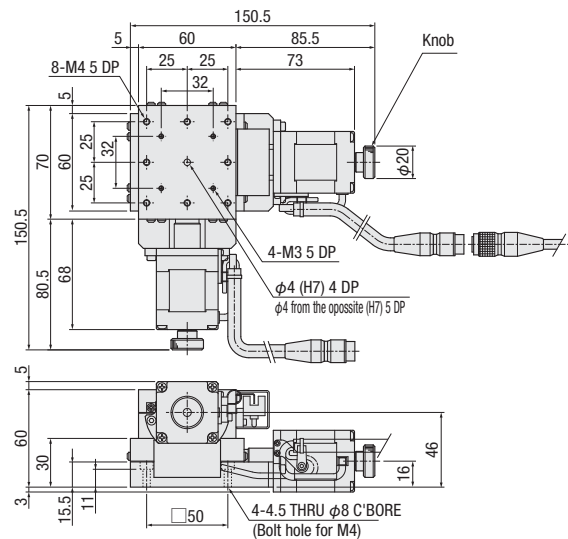
**KS201-30RC**



**KS201-30LMS**



**KS201-30RMS**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

104

## Z-axis Cross Roller Guide: KS301-30

RoHS

KS301-30LC



KS301-30LMS



KS301-30RC



KS301-30RMS



Model Selection code Option code  
**KS 301-30LC-5**

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-107~

**1 Axis**

3	Z-axis
---	--------

**2 Travel**

30	30mm
----	------

**3 Sensor cover location specification**

Code	Specification
L	L position
R	Opposite hand

**4 Motor option**

C	Standard
MS	<input type="checkbox"/> 38 Microstep

**5 Cable option**

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.  
 \* If you choose the option specification, please add the difference to standard price.  
 \* See page P.1-207, 209~ for more cable details.  
 \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

SPEC				
<b>Model</b>	<b>KS301-30LC-5</b>		<b>KS301-30LMS-5</b>	
<b>(Opposite hand)</b>	<b>KS301-30RC-5</b>		<b>KS301-30RMS-5</b>	
Mechanical specification	Travel length	30mm		
	Table size	60×70mm		
	Feed screw	Ball screwφ8 lead 1		
	Guide	Crossed roller guide		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy	Weight	0.89kg	1.07kg	
	Resolution (Pulse)	2μm/1μm	1μm/0.5μm	
	MAX speed	20mm/sec	10mm/sec	
	Load capacity (Excitation)	3.0kgf [29.4N]		
	Vertical degree	Within 15μm/Full stroke		
Sensor	Pitching/Yawing	Within 25"/Within 20"		
	Limit sensor	Installed		
	Origin sensor	Installed		
	Slit origin sensor	—		
	Provided screw (Hexagon-headed bolt)	4 of M4—16		
Single axis accuracy specification	Uni-directional positioning accuracy	Within 5μm		
	Repeatability positioning accuracy	Within ±0.3μm		
	Lost motion	Within 1μm		
	Backlash	Within 0.5μm		
	Straightness	Within 3μm		

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

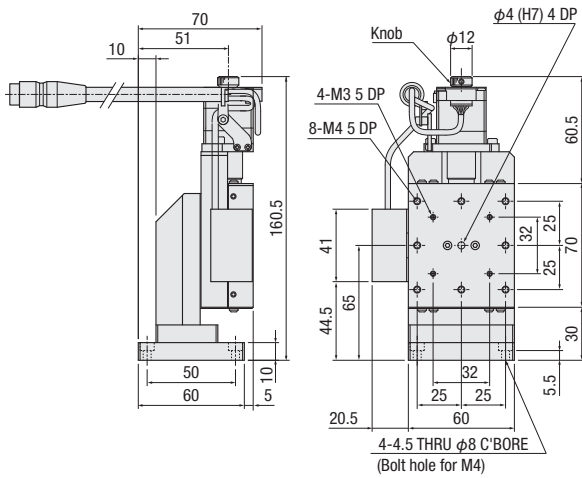
φ100

φ120

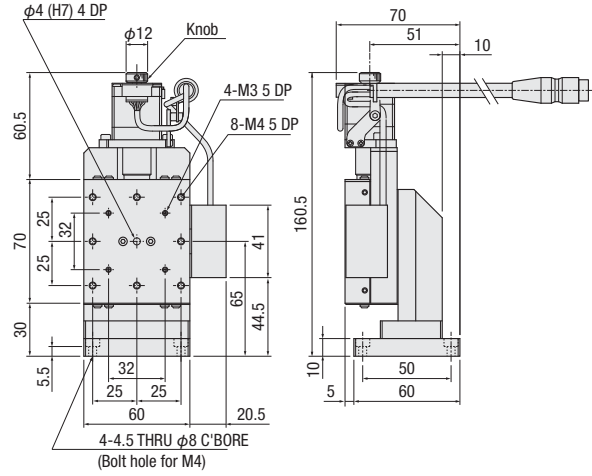
Other

**Dimensional outline drawings**

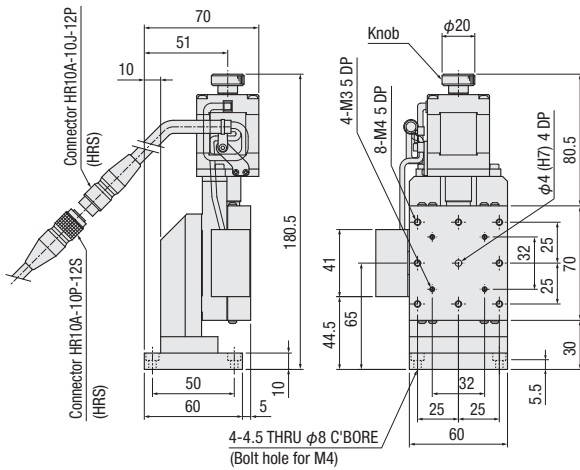
**KS301-30LC**



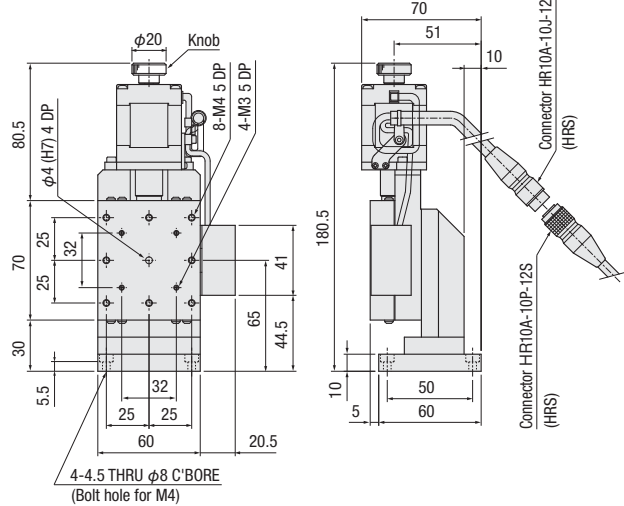
**KS301-30RC**



**KS301-30LMS**



**KS301-30RMS**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other



## Electrical Specification: KS101-30

### Electrical specification

Models		KS101-30LC KS101-30RC	KS101-30LMS KS101-30RMS	KS101-30LPA KS101-30RPA	KS101-30LQA KS101-30RQA
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)		α step motor (Oriental Motor Co.,Ltd.)	
	Model (*2)	PMM33BH2-C16-1 (□28mm)	C7214-9015-1 (□38mm)	ARM24SAK(□28mm)	ARM46AC (□42mm)
	Step angle	0.72°	0.36°	0.36° (Set to 1000P/R)	
Connector	Driver type	P.1-205~		ARD-K	ARD-A
	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		172211-6 (Tyco Electronics Japan G.K.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		171822-6 (Tyco Electronics Japan G.K.)	
	Contact type	—		170430-1 (Tyco Electronics Japan G.K.)	
Sensor	Compatible receiving contact	—		170205-1 (Tyco Electronics Japan G.K.)	
	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	—			
	Model	Photo microsensor PM-L24 (Panasonic Industrial Devices SUNX)			
	Power voltage	DC5~24V or less ±10%			
	Consumption current	45mA or less (15mA or less per 1 sensor)			
Control output	Control output	NPN open collector output DC30V or less/50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA			
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)			

\*1 See page P.1-213~ for details of single motor specification

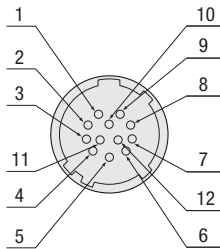
[α step motor]; Please see our web site for more details about motors.

\*2 Model is our own management model.

\* The electric specification of XY(PMG), Z(PZG) are the same.

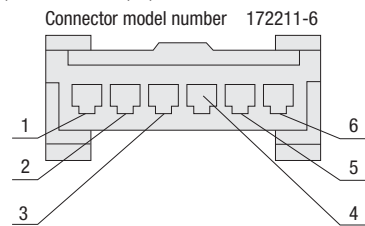
### Pin allocation

KS101-30L (MS)/KS101-30R (MS)



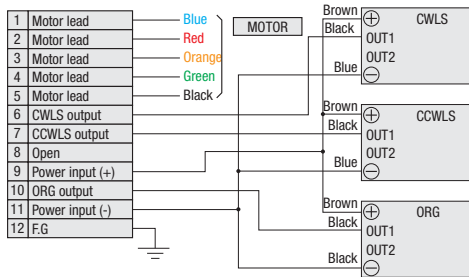
### Pin allocation

KS101-30LPA (QA)/KS101-30RPA (QA)



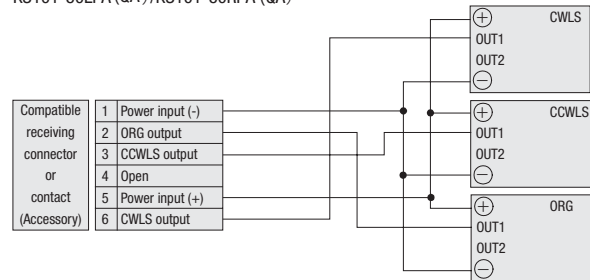
### Connection diagram

KS101-30L (MS)/KS101-30R (MS)

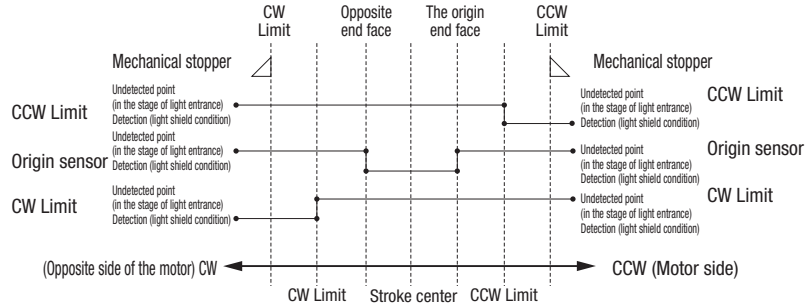
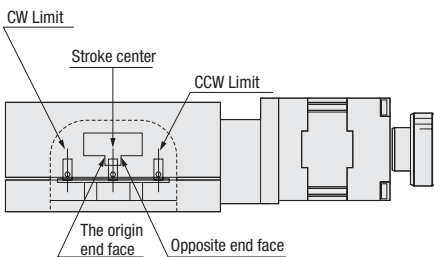


### Connection diagram

KS101-30LPA (QA)/KS101-30RPA (QA)



### Timing chart



Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Stroke center	The origin end face	CCW Limit	Mechanical limit
KS101-30	Return to origin	18.5	17.5	4	2	0	13.5	14.5
	Stroke center	16.5	15.5	2	0	2	15.5	16.5

\*Return to origin means that is performed return to origin Type 3 using DS102/DS112 series.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.

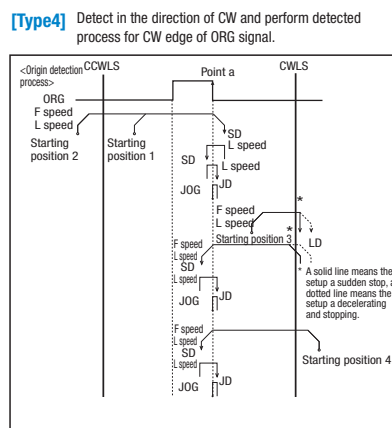
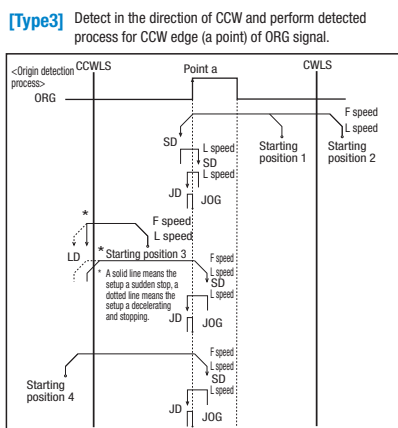
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

**Method for return to origin**

Suruga's motorized stages is different from the sensor specifications depends on models. As return to origin operation is divided into types, it is necessary to choose the correct type. Selected wrong type may be operated uncorrectly. Choose your best one whatever you need according to be recommended as below.

**KS101-30 series recommended return to origin** ▶ **Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.



**Adaptive driver**

**Driver** ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

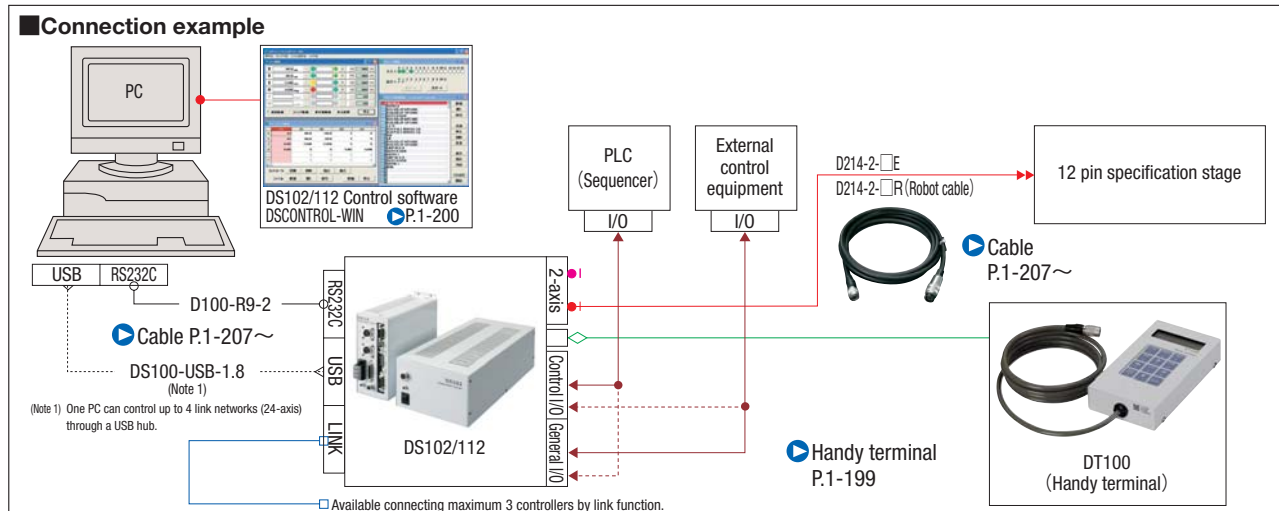
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller** ▶ P.1-197~

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connection example**



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

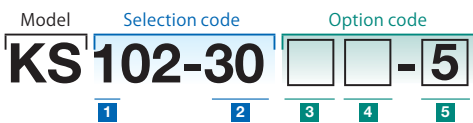
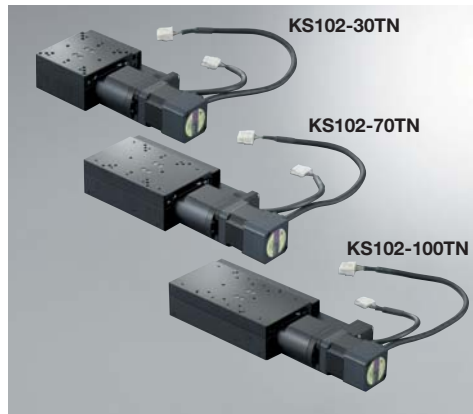
- Linear Ball
- CAVE-X Linear ball
- Cross Roller

- Slide Guide
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

## X-axis Cross Roller Guide: KS102

Motorized Stage

RoHS



▶ Cable P.1-207~  
 ▶ Electrical specification P.1-111~

### 1 Axis

1	X-axis
---	--------

### 2 Travel

30	30mm
70	70mm
100	100mm

### 3 Sensor cover location specification

Code	Specification
Blank	L position
R	Opposite hand

### 4 Motor option

Code	Specification
Blank	Standard
QA	<input type="checkbox"/> 42 $\alpha$ step

\* Must be chosen the cable from 2A~5R for QA.

■ Please contact us

- Available motor with electromagnetic brake
- Resolution is 2 $\mu$ m (Full) in case of motor with brake

### 5 Cable option

Code	Specification	Cable type
Blank	2m	D214-1-2E
1	2m One end loose	D214-1-2EK
2	4m	D214-1-4E
3	4m One end loose	D214-1-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-1-2R
7	Robot cable 4m	D214-1-4R
8	Robot cable 4m one end loose	D214-1-4RK
9	Robot cable 2m one end loose	D214-1-2RK
2A	2m ( $\alpha$ step)	—
5A	5m ( $\alpha$ step)	—
2R	Robot cable 2m ( $\alpha$ step)	—
5R	Robot cable 5m ( $\alpha$ step)	—

- \* One end loose position to only stage opposite side.
- \* If you choose the option specification, please add the difference to standard price.
- \* See page P.1-207, 209~ for more cable details.
- \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

$\phi$ 100

$\phi$ 120

Other

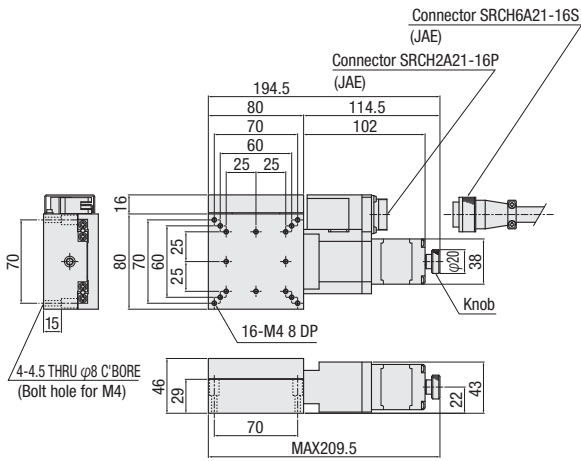
### SPEC

Model	KS102-30-5	KS102-70-5	KS102-100-5	KS102-30QA	KS102-70QA	KS102-100QA
(Opposite hand)	KS102-30R-5	KS102-70R-5	KS102-100R-5	KS102-30RQA	KS102-70RQA	KS102-100RQA
Travel length	30mm	70mm	100mm	30mm	70mm	100mm
Table size	80×80mm	80×130mm	80×160mm	80×80mm	80×130mm	80×160mm
Feed screw	Ball screw $\phi$ 8 lead 1					
Guide	Crossed roller guide					
Main materials-Finishing	Aluminum—Black almite finishing					
Weight	1.4kg	1.8kg	2.1kg	1.6kg	2.0kg	2.3kg
Resolution (Pulse)	1 $\mu$ m/0.5 $\mu$ m			1 $\mu$ m (Set to 1000P/R)		
	0.05 $\mu$ m (1/20 on resolution)					
MAX speed	10mm/sec					
Uni-directional positioning accuracy	Within 5 $\mu$ m		Within 10 $\mu$ m	Within 5 $\mu$ m		Within 10 $\mu$ m
Repeatability positioning accuracy	Within $\pm$ 0.3 $\mu$ m					
Load capacity	20kgf [196N]					
Moment stiffness	Pitch 0.07/yaw 0.06/roll 0.02 ["/N·cm]	Pitch 0.01/yaw 0.014/roll 0.01 ["/N·cm]	Pitch 0.005/yaw 0.011/roll 0.008 ["/N·cm]	Pitch 0.07/yaw 0.06/roll 0.02 ["/N·cm]	Pitch 0.01/yaw 0.014/roll 0.01 ["/N·cm]	Pitch 0.005/yaw 0.011/roll 0.008 ["/N·cm]
Lost motion	Within 1 $\mu$ m					
Backlash	Within 0.5 $\mu$ m					
Parallelism	Within 30 $\mu$ m					
Motion parallelism	Within 10 $\mu$ m	Within 15 $\mu$ m		Within 10 $\mu$ m	Within 15 $\mu$ m	
Pitching/Yawing	Within 25"/Within 15"	Within 25"/Within 20"		Within 25"/Within 15"	Within 25"/Within 20"	
Limit sensor	Installed					
Origin sensor	Installed					
Slit origin sensor	Installed					
Provided screw (Hexagon-headed bolt)	4 of M4—20					

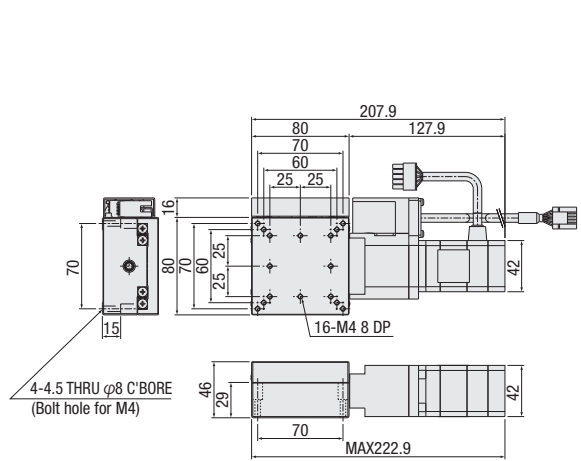
\* The price includes a driver for  $\alpha$  step. Motor cable sold separately. Please order from cable option 2A,5A,2R and 5R. Sensor cable attached only receiving connector. See page P.1-111~.  
 \* The controller for  $\alpha$  step drive is not supplied.

**Dimensional outline drawings**

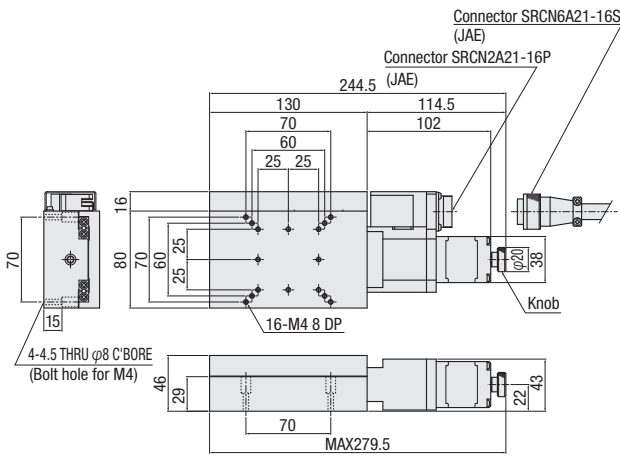
**KS102-30**



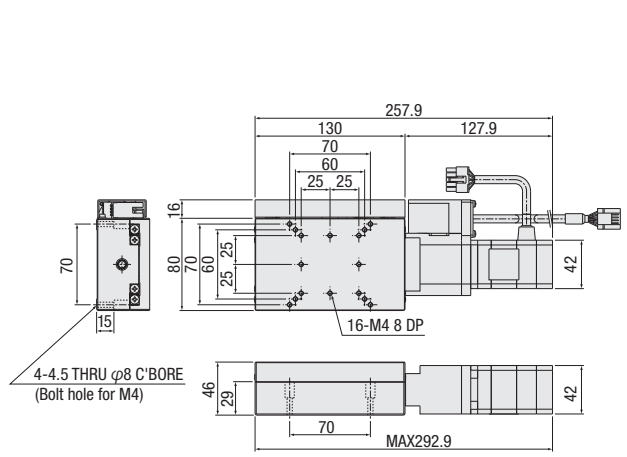
**KS102-30QA**



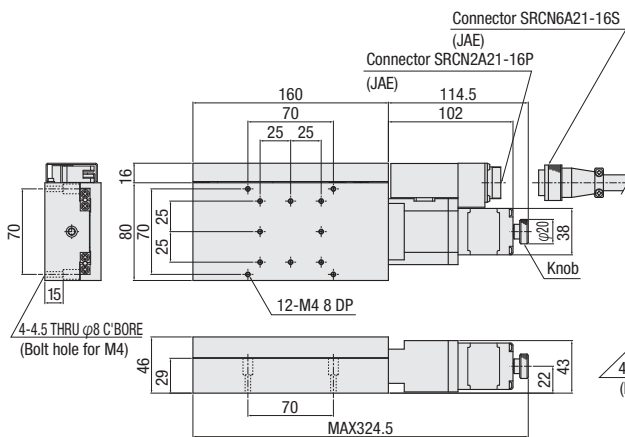
**KS102-70**



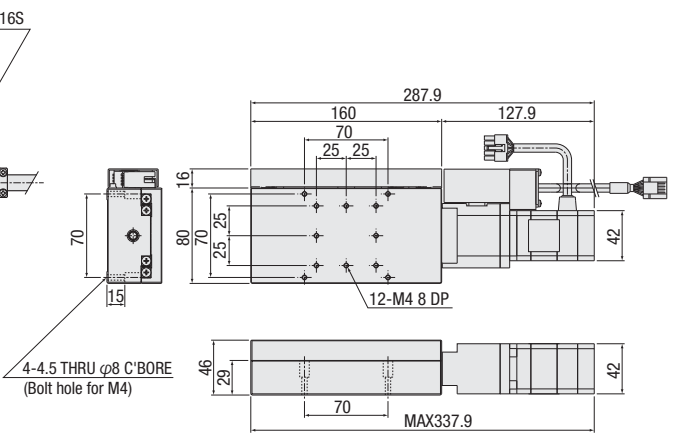
**KS102-70QA**



**KS102-100**



**KS102-100QA**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

110

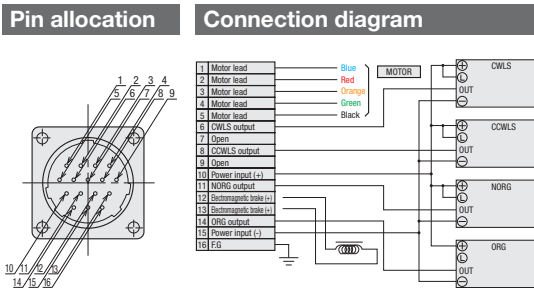
## Electrical Specification: KS102

### Electrical specification

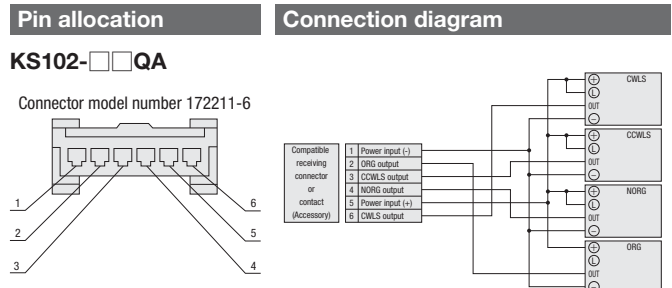
Models		KS102-30	KS102-70	KS102-100	KS102-30QA	KS102-70QA	KS102-100QA
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)			α step motor (Oriental Motor Co.,Ltd.)		
	Model	C7214-9015-1 (□38mm) Model is our own management model.			ARM46AC (□42mm)		
	Step angle	0.36°			0.36° (Set to 1000P/R)		
	Driver type	P.1-205~			ARD-A		
Connector	Model	SRCN2A21-16P (JAE)			172211-6 (Tyco Electronics Japan G.K.)		
	applicable connector on acceptance side	SRCN6A21-16S (JAE)			171822-6 (Tyco Electronics Japan G.K.)		
	Connector type	—			170430-1 (Tyco Electronics Japan G.K.)		
	applicable connector on acceptance side model	—			170205-1 (Tyco Electronics Japan G.K.)		
Sensor	Limit sensor	Installed					
	Origin sensor	Installed					
	Slit origin sensor	Installed					
	Model	Photo microsensor EE-SX673 (Omuron Co.,Ltd.)					
	Power voltage	DC5~24V ±10%					
	Consumption current	140mA or less (35mA or less per 1 sensor) NPN open collector output DC5~24V 100mA or less Residual voltage 0.8V or less when the load current is 100mA Residual voltage 0.4V or less when the load current is 16mA					
	Control output	On detection (light shield condition): Output transistor OFF (Non-continuity) (Only origin sensor is OFF when detected. (Non-continuity))					

\*1 See page P.1-213~ for details of single motor specification.

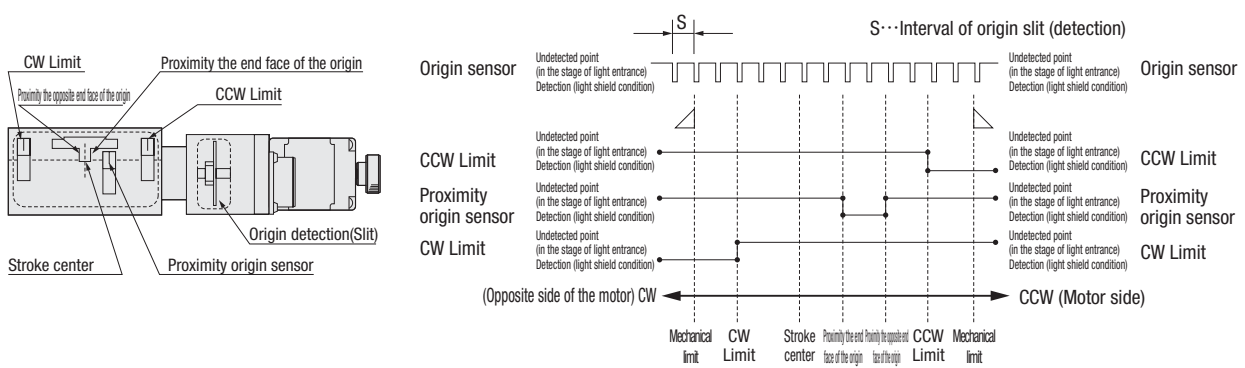
\* Motor for electromagnetic brake is PK545AWM. The resolution is 2μm/Pulse(full)



\*No.12 and 13 is open without electromagnetic brake.



### Timing chart



Unit [mm]	Direction of CW ←				→ Direction of CCW				
	Reference coordinate	Mechanical limit	CW Limit	Stroke center	The proximity origin end face	Proximity the opposite end face of the origin	CCW Limit	Mechanical limit	
φ40	KS102-30	Return to origin	—	23	7	0	6	9	—
φ50		Stroke center	—	16	0	7	13	16	—
φ60	KS102-70	Return to origin	—	63	27	0	6	9	—
φ70		Stroke center	—	36	0	27	33	36	—
φ80	KS102-100	Return to origin	—	93	42	0	6	9	—
φ100		Stroke center	—	51	0	42	48	51	—

The same Interval of origin slit (detection) S=1

\* Return to origin means that is performed return to origin type 1 using DS102/DS112 series.

\* Origin becomes any position till the origin sensor is detected shielded disk slit of the origin side after through the proximity end face.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic. Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

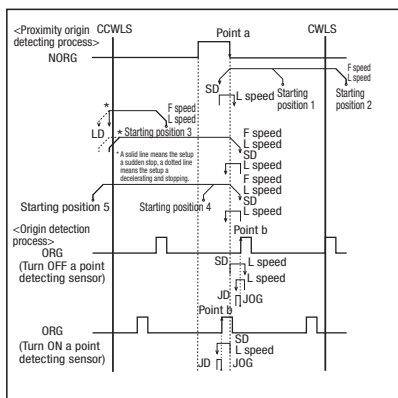
**Method for return to origin**

Suruga's motorized stages is different from the sensor specifications depends on models. As return to origin operation is divided into types, it is necessary to choose the correct type. Selected wrong type may be operated uncorrectly. Choose your best one whatever you need according to be recommended as below.

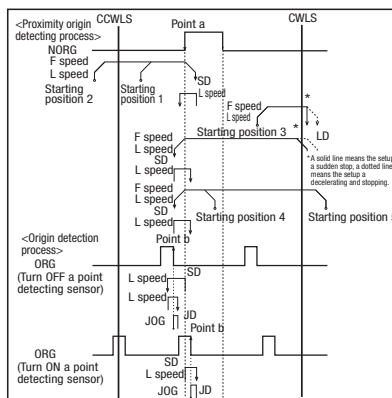
**KS102 recommended return to origin Return to origin sequence P.1-206~**

Type1: Detect in the direction of CCW and perform detected process for CW edge(point a) of NORG signal. Next detect an edge of CCW side(point b) of ORG signal.  
 Type2: Detect in the direction of CW and perform detected process for CCW edge of NORG signal. Next detect on edge of CW side (point b) of ORG signal.  
 Type7: After finished type1, perform detected process for CCW edge of TIMING signal.  
 Type8: After finished type2, perform detected process for CW edge of TIMING signal.

**[Type1]** Detect in the direction of CCW and perform detected process for CW edge(point a) of NORG signal. Next detect an edge of CCW side(point b) of ORG signal.



**[Type2]** Detect in the direction of CW and perform detected process for CCW edge(point a) of NORG signal. Next detect on edge of CW side (point b) of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

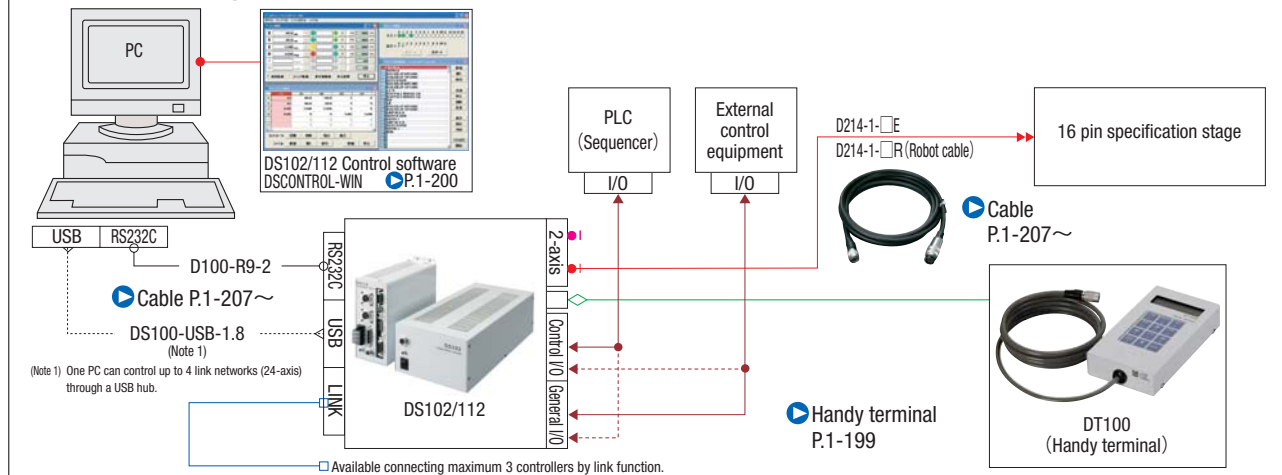
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connection example**



(Note 1) One PC can control up to 4 link networks (24-axis) through a USB hub.

Available connecting maximum 3 controllers by link function.

# Motorized Stage

## Horizontal Z-axis Stage: KHE04006-C/KHE06008-C(Linear ball guide)

KHE04006



KHE06008



RoHS

\* The photo shows an image.  
The holes and the shape may differ in certain respects from the actual product.

Motorized Stage

X

XY

Z

Horizontal Z

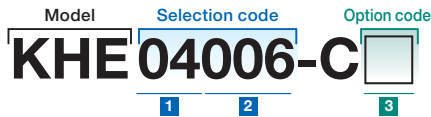
XYZ

Goniometer

Rotary

Unit

Controller



● Cable P.1-207~  
● Electrical specification P.1-115~

### 1 Table size

04	<input type="checkbox"/> 40mm
06	<input type="checkbox"/> 60mm

### 2 Travel length

006	6mm
008	8mm

### 3 Cable option

Code	Specification	Cable type
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* If you choose the option specification, please add the difference to standard price.

Electrical specification ● P.1-115~

\* See page ● P.1-207, 209~ for more cable details.

\* Please select "Code F or H" when connect with stepping motor controller(DS102/112).

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

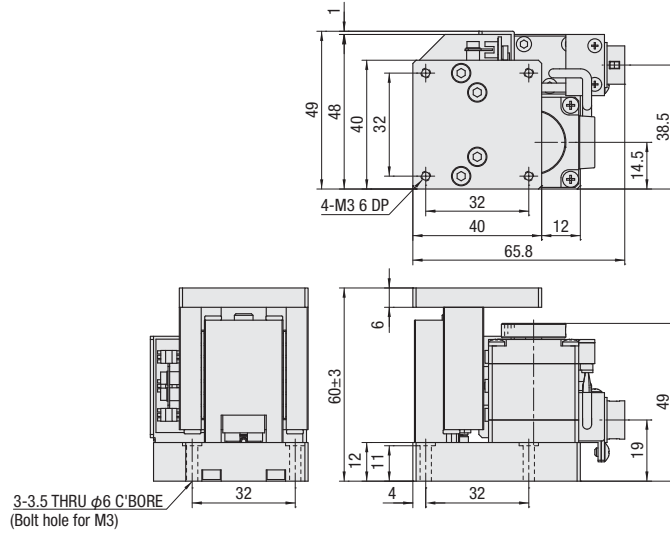
Other

### SPEC

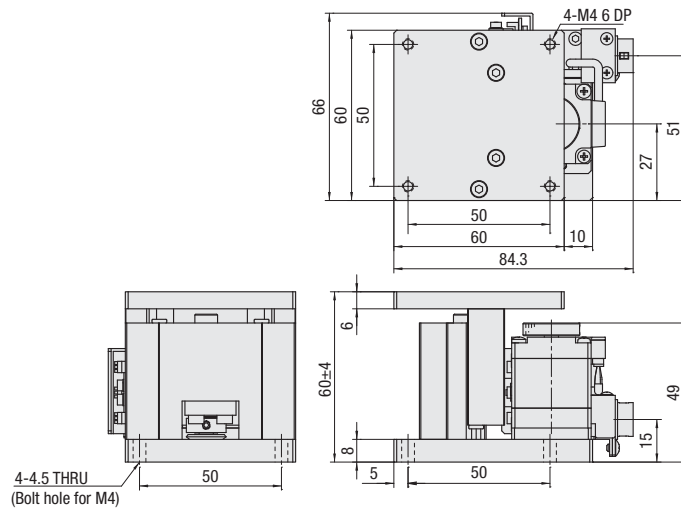
Model	KHE04006-C	KHE06008-C
Travel length	6mm	8mm
Table size	40×40mm	60×60mm
Feed screw (Ball screw)	φ6 lead 1	φ8 lead 1
Guide	Linear ball guide	
Main materials-Finishing	Steel—Opposite side of the end face finishing	
Weight	0.5kg	0.92kg
Resolution (Pulse)	2μm (Full)/1μm (Half)	
MAX speed	10mm/sec	
Positioning accuracy	—	
Repeatability positioning accuracy	Within ±5μm	
Load capacity	3kgf [29N]	4kgf [39N]
Lost motion	Within 5μm	
Parallelism	Within 80μm	
Limit sensor	Installed	
Origin sensor	Installed	
Provided screw (Hexagon-headed bolt)	3 of M3—16	4 of M4—14

Dimensional outline drawings

KHE04006-C



KHE06008-C



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

114



## Electrical Specification: KHE04006-C/KHE06008-C

### Electrical specification

Models		KHE04006-C	KHE06008-C
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase	
	Maker	Oriental Motor Co.,Ltd.	
	Model (*2)	PK523HPB-C17	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12PC (71) (Hirose Electric Co.,Ltd.)	
	Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Model	Photo microsensor EE-SX4134 (Omuron Co.,Ltd.)	
	Power voltage	DC5~24V ±10%	
	Consumption current	Total 60mA or less	
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA	
	Limit output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)	
	Origin output logic	Detection (Light): Output transistor ON (Continuity)	

\*1 See page P.1-177~ for details of single motor specification  
\*2 Model is our own management model.

X

XY

Z

Horizontal Z

XYZ

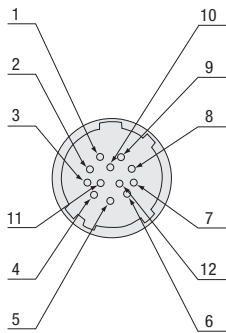
Goniometer

Rotary

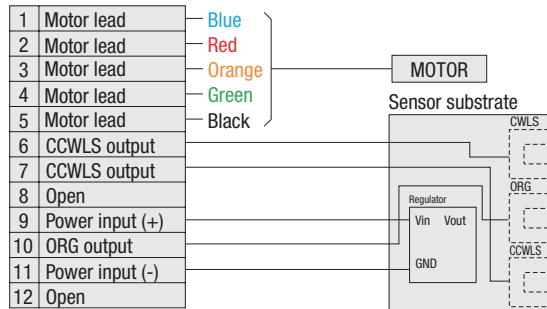
Unit

Controller

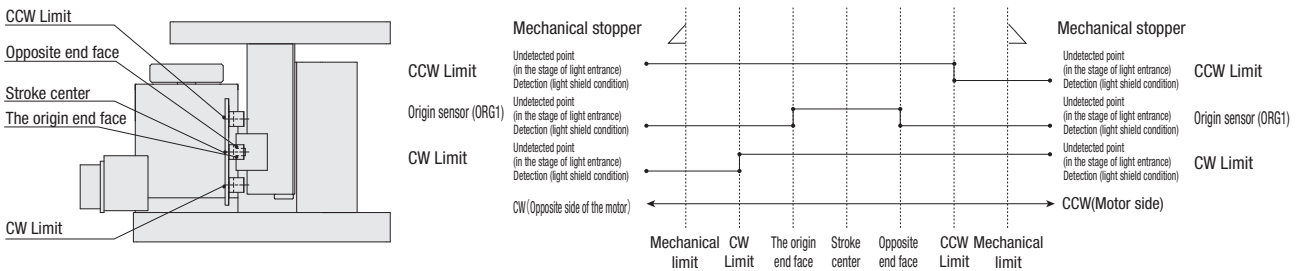
### Pin allocation



### Connection diagram



### Timing chart



Unit [mm]	Reference coordinate	Direction of CW ←					→ Direction of CCW	
		Mechanical limit	CW Limit	Origin	Stroke center	Opposite end face	CCW Limit	Mechanical limit
<b>KHE04006-C</b>	Return to origin	3	2.2	0	1	2	4.2	5
	Stroke center	4	3.2	1	0	1	3.2	4
<b>KHE06008-C</b>	Return to origin	4	3.2	0	1	2	5.2	6
	Stroke center	5	4.2	1	0	1	4.2	5

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.  
\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

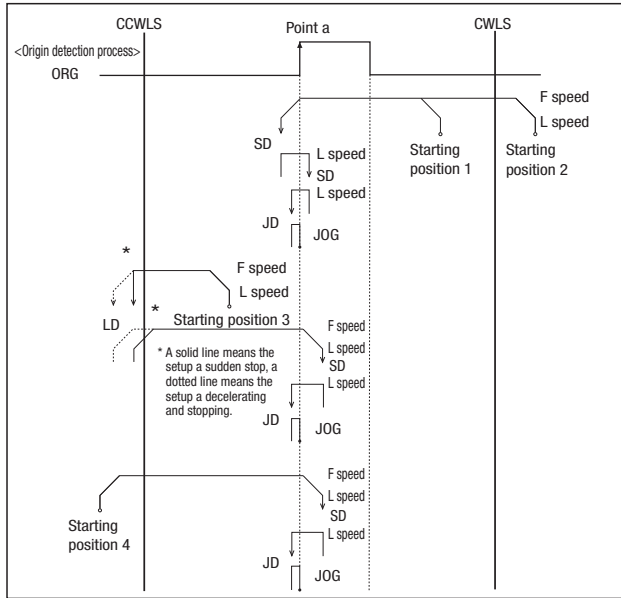
φ120

Other

**KHE series recommendation return to origin method**

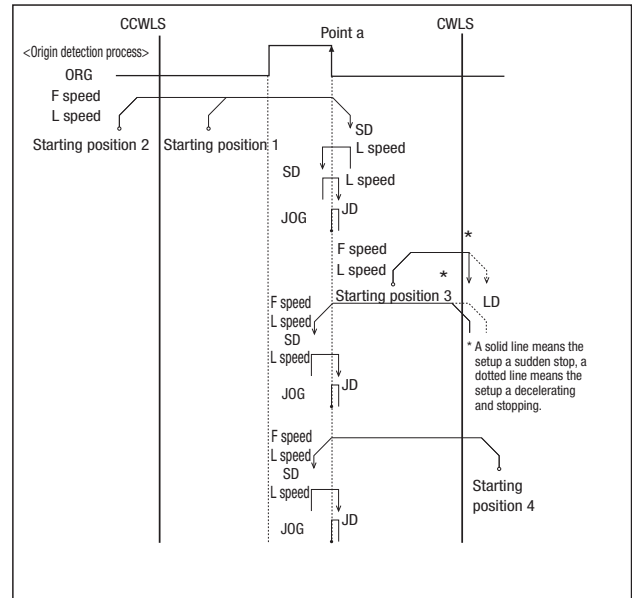
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Type10]** After finished Type4, perform detected process for CW edge of TIMING signal.

Return to origin sequence P.1-201~

**Adaptive driver**

■ Driver P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

■ Controller P.1-197~

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

116

# Motorized Stage

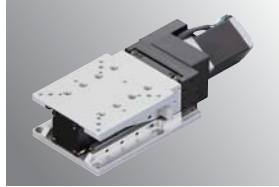
## Horizontal Z-axis Cross Roller Guide: KHC06004/KHC07004/KS332

Motorized Stage

KHC06004F



KHC07004F



KS332-8N



KS332-12



※ Can be used for KHC  
 See page P.009

■ KHE series/Low-price motorized horizontal Z stage  
 P.1-113~



▶ Cable P.1-207~  
 ▶ Electrical specification P.1-119~

**1 Table size**

06	60mm
07	70mm

**2 Travel**

04F	4mm
-----	-----

**5 Travel**

8N	8mm
12	12mm

**6 Cable option**

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.  
 \* If you choose the option specification, please add the difference to standard price.  
 \* See page P.1-207, 209~ for more cable details.  
 \* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

**SPEC**

Model		KHC06004F	KHC07004F	KS332-8N-5	KS332-12-5
Mechanical specification	Travel length	4mm			
	Table size	60×60mm	70×70mm	80×100mm	120×120mm
	Feed screw	Ball screwφ8 lead 1		Ball screwφ6 lead 1	Ball screwφ8 lead 1
	Guide	Wedge type Crossed roller guide			
Main materials-Finishing		Aluminum—Black almite finishing	Aluminum—White almite finish	Aluminum—Black almite finishing	
	Weight	1.14kg	1.18kg	2.0kg	3.6kg
Accuracy specification	Resolution (Pulse)	0.25μm (Full)/0.125μm (Half)		≒0.73μm (Full)/0.365μm (Half)	
	MAX speed	2.5mm/sec		≒3.7mm/sec	
	Uni-directional positioning accuracy	Within 7μm		—	
	Repeatability positioning accuracy	Within ±0.5μm			
Load capacity		7kgf [68.6N]		20kgf [196N]	
	Moment stiffness	Pitch 0.2/yaw 0.04/roll 0.14 [°/N · cm]		Pitch 0.24/yaw 0.12/roll 0.03 [°/N · cm]	Pitch 0.20/yaw 0.11/roll 0.01 [°/N · cm]
Lost motion		Within 1μm			
	Parallelism	Within 50μm			
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	Installed		—	
Provided screw (Hexagon-headed bolt)		4 of M4—12		4 of M4—16	4 of M6—16

\*Selectable KH sensor logic.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

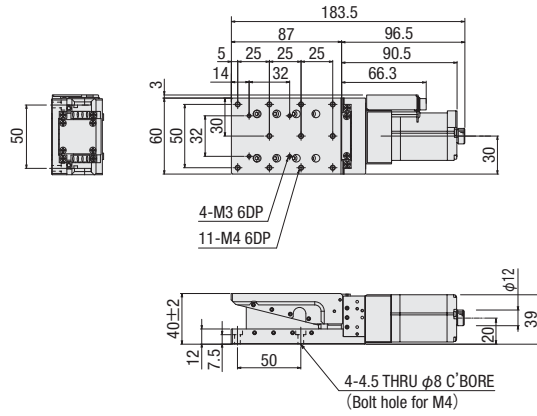
φ100

φ120

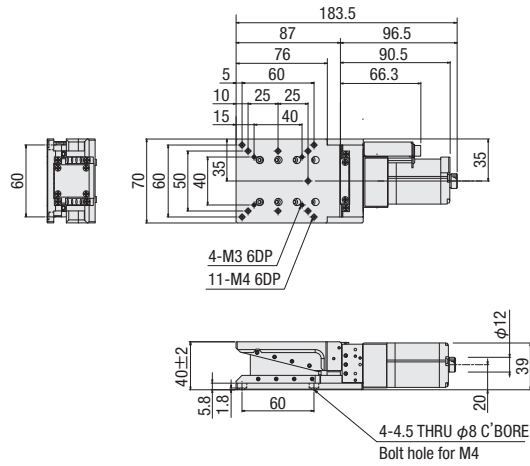
Other

**Dimensional outline drawings**

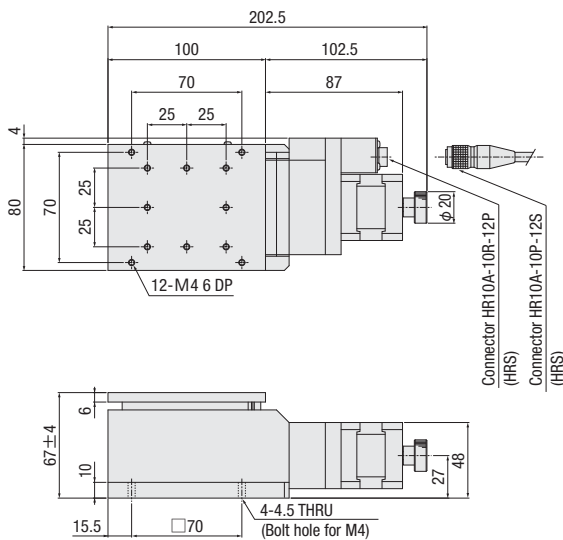
**KHC06004F**



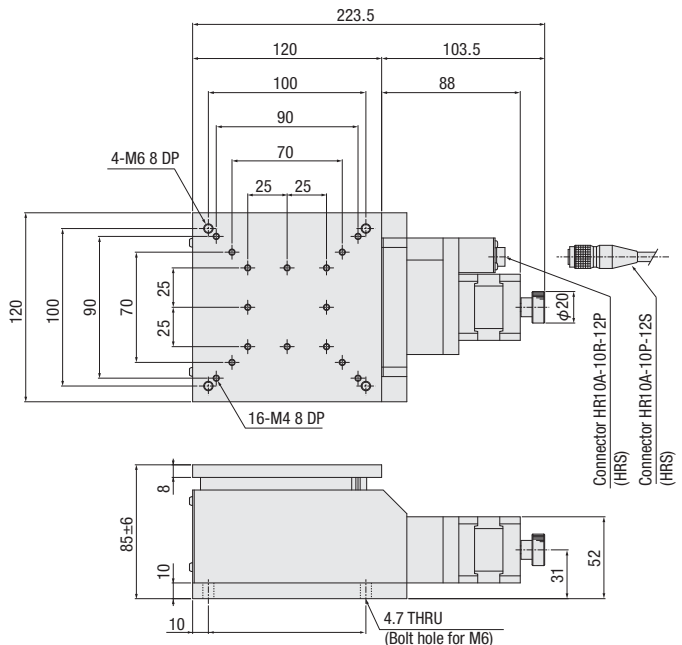
**KHC07004F**



**KS332-8N**



**KS332-12**



Motorized Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

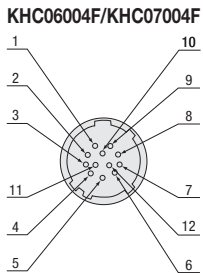
### Electrical specification

Models		KHC06004F	KHC07004F	KS332-8N	KS332-12
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)			
	Model	PK525HPB-C1 (□38mm)		PK544-NB-C16	
	Step angle	0.72°		0.72°	
Connector	Model(*2)	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	Installed			
	Origin sensor (ORG1)	Installed			
	Slit origin sensor (ORG2)	—			
	Model	Micro photosensor EE-SX4134(omuron Co.,Ltd.)		Limited switch AV4044 (Panasonic) 0.1A 30V DC Photo microsensor EE-SX671 (Omron Co.,Ltd.)	
	Power voltage	DC5~24V ±10%			
	Consumption current	Total 60mA or less		35mA or less	
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA		NPN open collector output DC5~24V100mA or less Residual voltage 0.8V or less when the load current is 100mA Residual voltage 0.4V or less when the load current is 40mA	
Output logic(*)	On detection (light shield condition) : Output transistor OFF (Non-continuity)		On detection (light shield condition): Output transistor OFF (Non-continuity)		

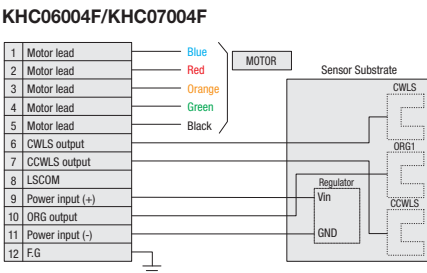
\*1 See page P.1-213 – for details of single motor specification

\*2 Model is our own management model.

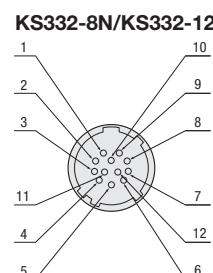
### Pin allocation



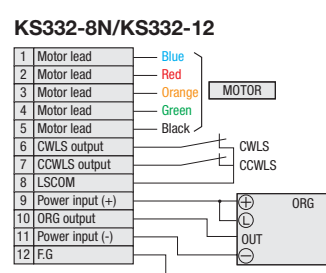
### Connection diagram



### Pin allocation

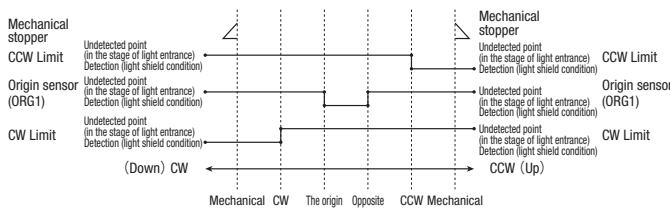
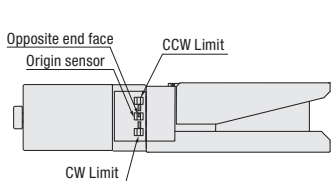


### Connection diagram



Timing chart

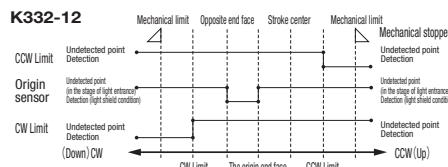
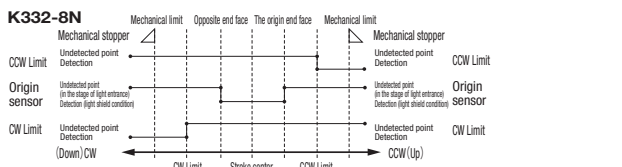
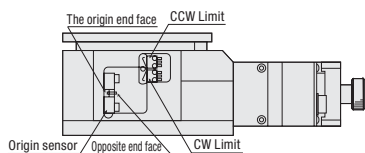
KHC06004F/KHC07004F



Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	The origin end face stroke center	Opposite end face	CCW Limit	Mechanical limit
	Return to origin	2.5	2.2	1.5	0	2.2	2.5
	Return to origin	2.5	2.2	1.5	0	2.2	2.5

\*Return to origin means that is performed return to origin type 3 using DS102/DS112/D200 controller.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

KS332-8N/KS332-12



Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Stroke center	The origin end face	CCW Limit	Mechanical limit
	Return to origin	—	4.9	2.2	0.4	0	4.1	—
	Stroke center	—	4.5	1.8	0	0.4	4.5	—

Unit [mm]	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Stroke center	The origin end face	CCW Limit	Mechanical limit
	Return to origin	—	7.6	2.2	1.1	0	5.4	—
	Stroke center	—	6.5	1.1	0	1.1	6.5	—

\*Return to origin means that is performed return to origin Type 3 using DS102/DS112 series.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

\*Return to origin means that is performed return to origin Type 3 using DS102/DS112 series.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Method for return to origin

Suruga's motorized stages is different from the sensor specifications depends on models. As return to origin operation is divided into types, it is necessary to choose the correct type. Selected wrong type may be operated uncorrectly. Choose your best one whatever you need according to be recommended as below.

■ KHC06004F/KHC07004F/KS332-8N/KS332-12 recommended return to origin Return to origin sequence ▶ P.1-201~

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

Adaptive driver · Stepping motor controller

■ Driver ▶ P.1-205~

DC24 type input.....SD5107P3-A22 (Full/Half) / CRD5107P (1~1/250 16 steps) / DFC5107P  
 AC100V input.....RKD507-A (1~1/250 16 steps)

■ Controller ▶ P.1-197~

AC100-240V input Without general I/O port.....DS102NR (Full/Half) / DS102MS (1~1/250 16 steps)  
 With general I/O port.....DS102NR-IO (Full/Half) / DS102MS-IO (1~1/250 16 steps)  
 DC24V input Without general I/O port.....DS112NR (Full/Half) / DS112MS (1~1/250 16 steps)  
 With general I/O port.....DS112NR-IO (Full/Half) / DS112MS-IO (1~1/250 16 steps)

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

120

## Slide Guide KXS Series Guidance



### Functions

#### ● Cover type

- Anti-drop foreign material
- Grease antiscattering

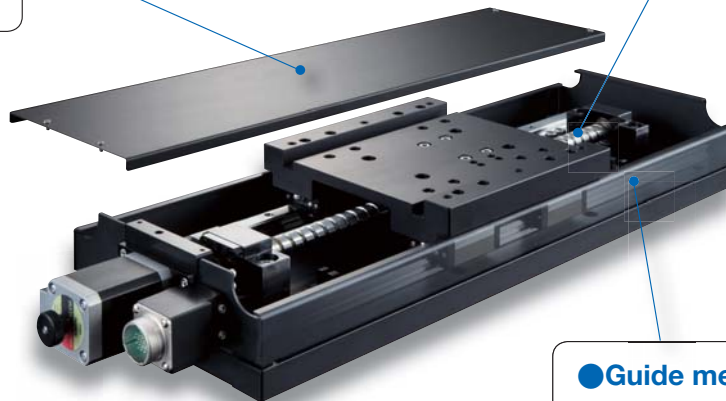
#### ● Motor option

- Servo motor
- $\alpha$ Step motor
- Electromagnetic brake

▶P.1-135~

#### ● Ball screw lead option

- High resolution (5mm)
- High speed (10mm)



#### ● Guide mechanism

Slide guide



### Features

#### ■ Long stroke

Slide guide allows long stroke.

#### ■ Low price

Realize low price in in-house production ball screws.

#### ■ High quality

Provide stable high quality by internally parts.

#### ■ Compact

Place the sensor inside body. No projection on any side.

## Stroke line-up

Axis	Cover	Ball screw lead	Travel				
			100mm	200mm	300mm	400mm	500mm
X-axis	Installed	5mm	●	●	●	●	●
		10mm	●	●	●	●	●
	Uncovered	5mm	●	●	●	●	●
		10mm	●	●	●	●	●
XY-axis	Installed	5mm	●	●	●	—	—
		10mm	●	●	●	—	—
	Uncovered	5mm	●	●	●	—	—
		10mm	●	●	●	—	—
Z-axis	Installed	5mm	●	●	●	—	—
	Uncovered		●	●	●	—	—

## For proper operation

### ▽How to mount

Fix with supplied screws

### ▽About the object that mounted on upper/bottom of stage.

When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.

[Approximate flatness: up to 10 $\mu$ m]

### ▽Positioning

#### ■Position of stage mounting

All products SPEC shows must be shown flat setting condition.

Pay attention to mount such as up side down, vertical on the side and horizontal on the side.

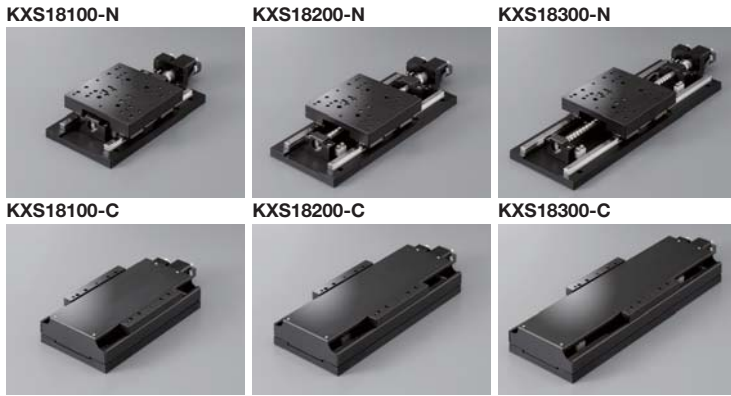
Load capacity and accuracy might be changed by the positioning.



## X-axis Slide Guide: KXS18100/KXS18200/KXS18300

Motorized Stage

RoHS



Model Selection code Option code  
**KXS18100-N5-JA**

1 2 3 4 5

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-135~

### 1 Travel length

100	100mm
200	200mm
300	300mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

5	lead 5mm
10	lead 10mm

### 4 Motor option

Code	Specification
J	Standard
SA	With electromagnetic brake (Driver set)
QA	$\alpha$ Step (Driver set)
W	Servo motor (Amplifier set)

\* SA·QA·W included driver and cable.  
 \* See page ▶ P.1-135~ for details of Motor option.

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-1-2E
B	2m One end loose	D214-1-2EK
C	4m	D214-1-4E
D	4m One end loose	D214-1-4EK
E	Connector	—
F	Robot cable 2m	D214-1-2R
G	Robot cable 2m one end loose	D214-1-2RK
H	Robot cable 4m	D214-1-4R
J	Robot cable 4m one end loose	D214-1-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 Not available non-cable. See page ▶ P.1-207~ for details of cable.  
 \* See page ▶ P.1-207, 209~ for more cable details.  
 \* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor / cable products list	Motor code	Cable code
	J	Blank, A~H, J
SA	M	
QA	P	
W	U	

		SPEC						
Model	Uncovered	KXS18100-N5-J	KXS18100-N10-J	KXS18200-N5-J	KXS18200-N10-J	KXS18300-N5-J	KXS18300-N10-J	
	Covered	KXS18100-C5-J	KXS18100-C10-J	KXS18200-C5-J	KXS18200-C10-J	KXS18300-C5-J	KXS18300-C10-J	
Mechanical specification	Travel length	100mm			200mm		300mm	
	Table size	180×180mm						
	Feed screw (Ball screw)	$\phi 15$ lead 5	$\phi 15$ lead 10	$\phi 15$ lead 5	$\phi 15$ lead 10	$\phi 15$ lead 5	$\phi 15$ lead 10	
Accuracy specification	Guide	Slide guide						
	Main materials-Finishing	Aluminum—Black almite finishing						
	Weight	Uncovered 8.32kg	8.32kg	9.48kg	9.48kg	10.72kg	10.72kg	
		Covered 8.12kg	8.12kg	9.37kg	9.37kg	10.70kg	10.70kg	
Sensor	Resolution (Pulse)	lead 5: 10 $\mu$ m/5 $\mu$ m lead 10: 20 $\mu$ m/10 $\mu$ m lead 5: 0.5 $\mu$ m (1/20 on resolution) lead 10: 1 $\mu$ m (1/20 on resolution)						
	MAX speed	lead 5mm 30mm/sec lead 10mm 50mm/sec						
	Uni-directional positioning accuracy	Within 15 $\mu$ m		Within 20 $\mu$ m		Within 30 $\mu$ m		
	Repeatability positioning accuracy	Within $\pm 1\mu$ m						
	Load capacity	30kgf [294N]						
	Moment stiffness	Pitch 0.005/yaw 0.008/roll 0.003[°/N·cm]						
	Backlash	Within 2 $\mu$ m						
	Straightness	Within 10 $\mu$ m		Within 15 $\mu$ m		Within 20 $\mu$ m		
	Parallelism	Within 50 $\mu$ m						
	Motion parallelism	Within 20 $\mu$ m						
Sensor	Pitching/Yawing	Within 30°/Within 20°		Within 50°/Within 20°		Within 60°/Within 30°		
	Limit sensor	Installed						
	Origin sensor	Installed						
Slit origin sensor	Installed							
Provided screw (Hexagon-headed bolt)	8 of M6—20							

\* Might be changed specification due to motors. See page ▶ P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

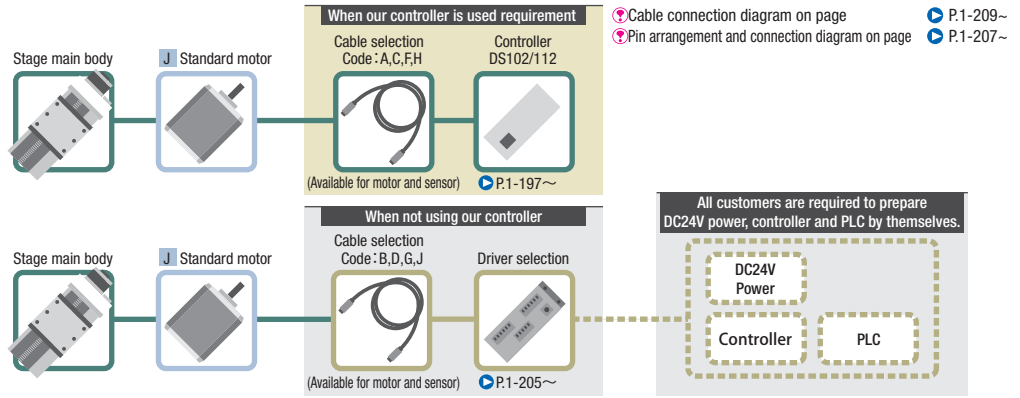
$\phi 100$

$\phi 120$

Other

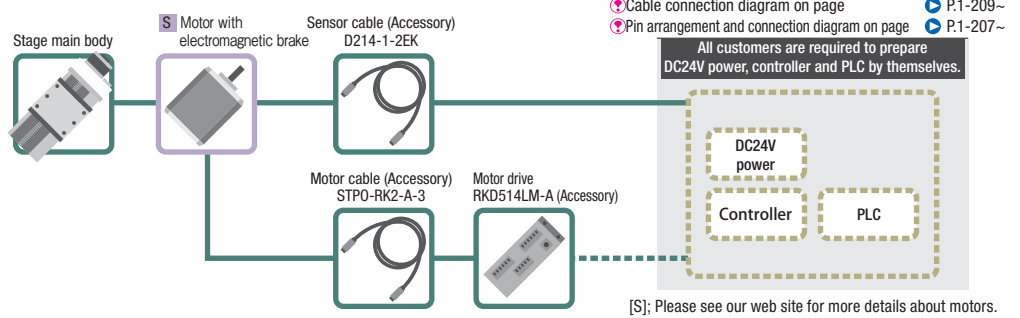
Motor option

**J Standard motor**  
 Motor model  
 PK546PB



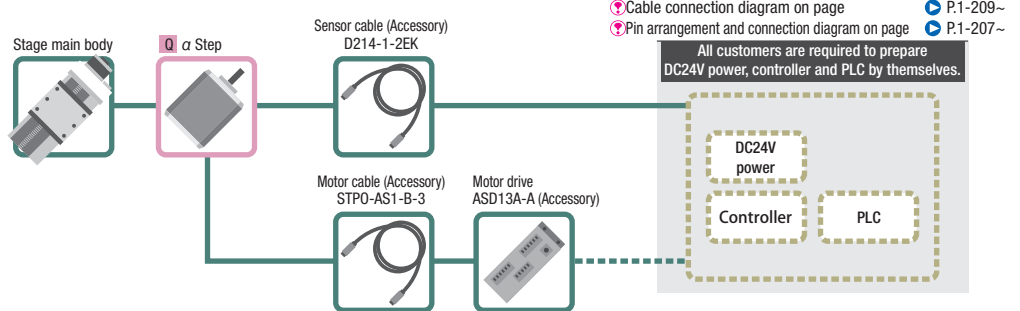
Motor option

**S With electromagnetic brake**  
 Motor model  
 PK566AEM



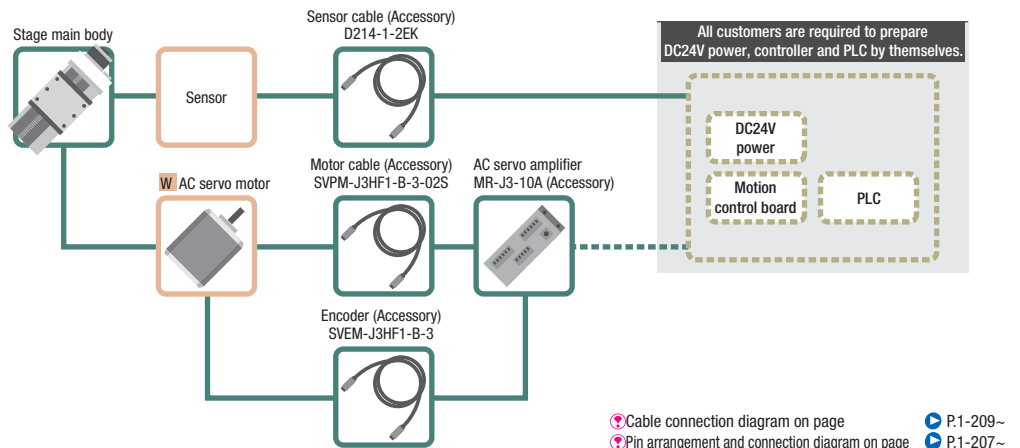
Motor option

**Q α Step**  
 Motor model  
 ASM46AA



Motor option

**W AC servo motor**  
 Motor model  
 HF-KP13



Motor code	J	S	Q	W
Feature	Standard	With electromagnetic brake	Small step-out	High speed
Type	5 phase stepping motor 0.75A/Phase	5 phase stepping motor 1.4A/Phase	α step motor	AC servo motor
Motor model※	<b>PK546PB</b>	<b>PK566AEM</b>	<b>ASM46AA</b>	<b>HF-KP13</b>
Resolution	lead 5mm	Full/Half	10μm/5μm	18 bits encoder (262144P/R)
		Micro step (1/20 split)	0.5μm	
	lead 10mm	Full/Half	20μm/10μm	
		Micro step (1/20 split)	1μm	
MAX speed	lead 5mm	30mm/sec	140mm/sec	100mm/sec
	lead 10mm	50mm/sec	215mm/sec	120mm/sec
				200mm/sec
				400mm/sec

※Model is our own management model.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

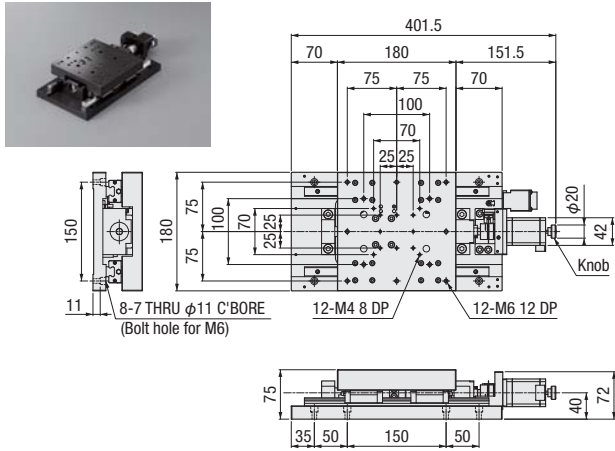
# Motorized Stage

## X-axis Slide Guide: KXS18100/KXS18200/KXS18300

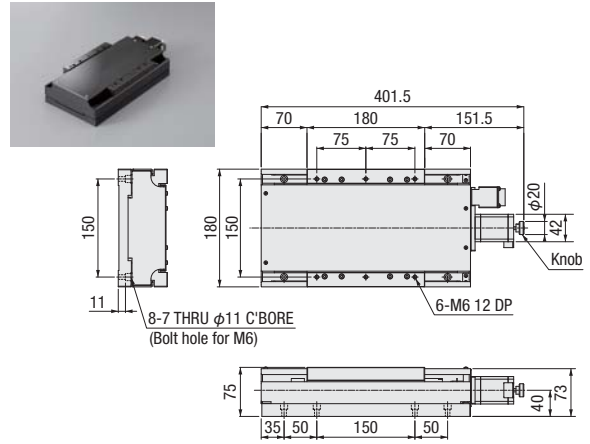
Motorized Stage

### Dimensional outline drawings

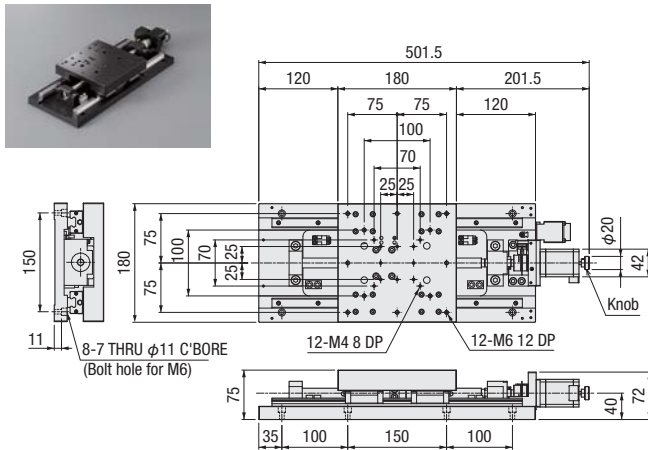
**KXS18100-N5-J (KXS18100-N10-J)**



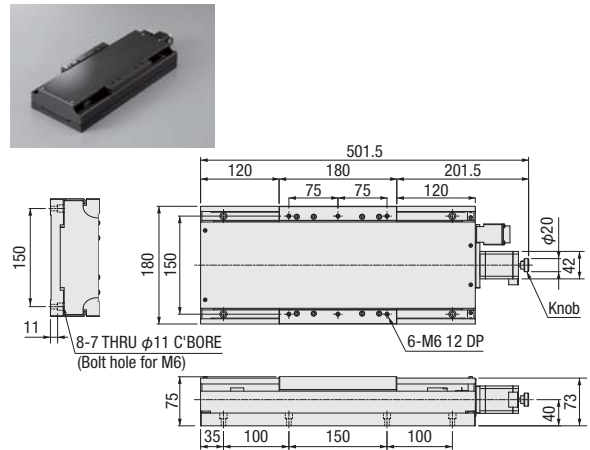
**KXS18100-C5-J (KXS18100-C10-J)**



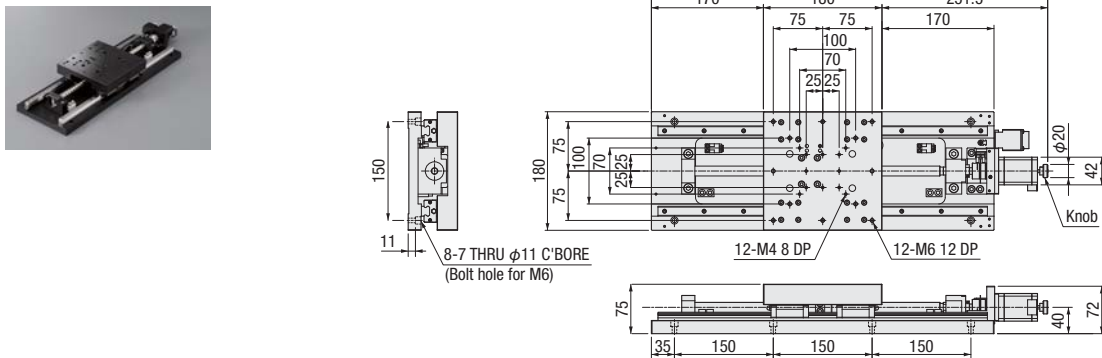
**KXS18200-N5-J (KXS18200-N10-J)**



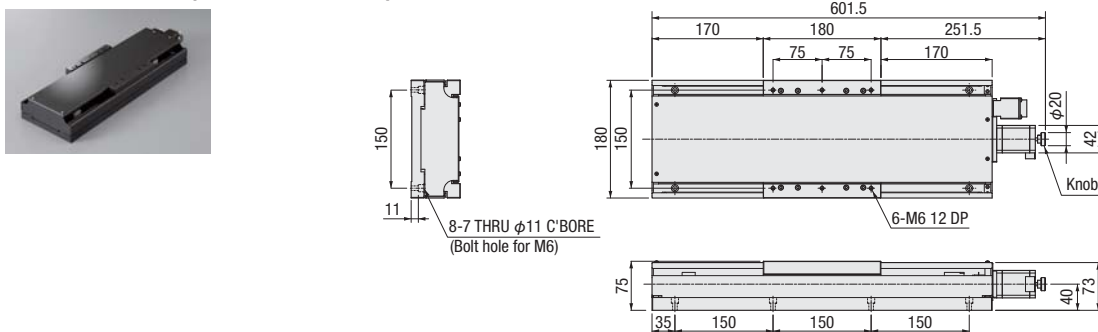
**KXS18200-C5-J (KXS18200-C10-J)**



**KXS18300-N5-J (KXS18300-N10-J)**



**KXS18300-C5-J (KXS18300-C10-J)**



X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other



PART  
COMMUNITY

CAD  
DATA



CAD  
3D・2D

X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear  
Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

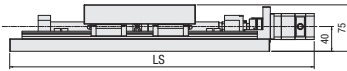
126

**Dimensional outline drawings**

**J** Standard motor

Motor model PK546PB

That is applicable to  
uncovered and covered

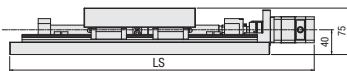


Model	J (Standard)	
	Motor size	LS
KXS18100-□□-J□	□42	402
KXS18200-□□-J□		502
KXS18300-□□-J□		602

**SA** With electromagnetic brake

Motor model PKE566MC

That is applicable to  
uncovered and covered



Model	SA (Electromagnetic brake)		J (Standard)
	Motor size	LS	LS
KXS18100-□□-SAM	□60	422.5	402
KXS18200-□□-SAM		525.5	502
KXS18300-□□-SAM		625.5	602

**QA** α step

Motor model ARM46AC

That is applicable to  
uncovered and covered

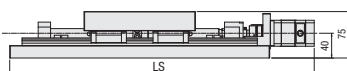


Model	QA (α step)		J (Standard)
	Motor size	LS	LS
KXS18100-□□-QAP	□42	395	402
KXS18200-□□-QAP		495	502
KXS18300-□□-QAP		595	602

**W** AC servo motor

Motor model HF-KP13

That is applicable to  
uncovered and covered

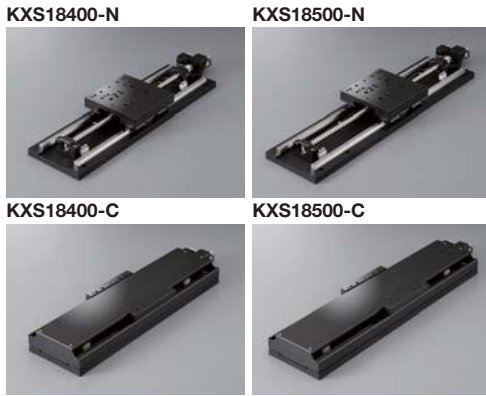


Model	W (Servo motor)		J (Standard)
	Motor size	LS	LS
KXS18100-□□-WU	□40	415	402
KXS18200-□□-WU		515	502
KXS18300-□□-WU		615	602

## X-axis Slide Guide: KXS18400/KXS18500

Motorized Stage

RoHS



Model Selection code Option code  
**KXS18400-N5-JA**  
 1 2 3 4 5

▶ Cable P.1-207~  
 ▶ Electrical specification P.1-135~

### 1 Travel length

400	400mm
500	500mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

5	lead 5mm
10	lead 10mm

### 4 Motor option

Code	Specification
J	Standard
SA	With electromagnetic brake (Driver set)
QA	$\alpha$ Step (Driver set)
W	Servo motor (Amplifier set)

\*SA·QA·W included driver and cable.  
 \* See page ▶ P.1-135~ for details of Motor option.

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-1-2E
B	2m One end loose	D214-1-2EK
C	4m	D214-1-4E
D	4m One end loose	D214-1-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-1-2R
G	Robot cable 2m one end loose	D214-1-2RK
H	Robot cable 4m	D214-1-4R
J	Robot cable 4m one end loose	D214-1-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 \* Not available non-cable. See page ▶ P.1-207~ for details of cable.  
 \* See page ▶ P.1-207, 209~ for more cable details.  
 \* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/cable products list	Motor code	Cable code
	J	Blank, A~H, J
SA	M	
QA	P	
W	U	

		SPEC				
Model	Uncovered	KXS18400-N5-J	KXS18400-N10-J	KXS18500-N5-J	KXS18500-N10-J	
	Covered	KXS18400-C5-J	KXS18400-C10-J	KXS18500-C5-J	KXS18500-C10-J	
Mechanical specification	Travel length	400mm		500mm		
	Table size	180×180mm				
	Feed screw (Ball screw)	$\phi$ 15 lead 5	$\phi$ 15 lead 10	$\phi$ 15 lead 5	$\phi$ 15 lead 10	
	Guide	Slide guide				
Weight	Main materials-Finishing	Aluminum—Black almite finishing				
	Uncovered	11.92kg		13.10kg		
Accuracy specification	Covered	11.99kg		13.26kg		
	Resolution (Pulse)	Full/ Half	lead 5: 10 $\mu$ m/5 $\mu$ m		lead 10: 20 $\mu$ m/10 $\mu$ m	
		Microstep	lead 5: 0.5 $\mu$ m (1/20 on resolution)		lead 10: 1 $\mu$ m (1/20 on resolution)	
	MAX speed	lead 5mm	30mm/sec			
		lead 10mm	50mm/sec			
	Uni-directional positioning accuracy		Within 35 $\mu$ m		Within 40 $\mu$ m	
	Repeatability positioning accuracy		Within $\pm$ 1 $\mu$ m			
	Load capacity		30kgf [294N]			
	Moment stiffness		Pitch 0.005/yaw 0.008/roll 0.003 ["/N·cm]			
	Sensor	Backlash		Within 2 $\mu$ m		
Straightness		Within 25 $\mu$ m			Within 30 $\mu$ m	
Parallelism			Within 50 $\mu$ m			
Motion parallelism			Within 30 $\mu$ m			
Pitching/Yawing	Within 60"/Within 30"			Within 70"/Within 30"		
Limit sensor			Installed			
Origin sensor			Installed			
Slit origin sensor			Installed			
Provided screw (Hexagon-headed bolt)		8 of M6—20		12 of M6—20		

\* Might be changed specification due to motors. See page ▶ P.1-213~ for details.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi$ 40

$\phi$ 50

$\phi$ 60

$\phi$ 70

$\phi$ 80

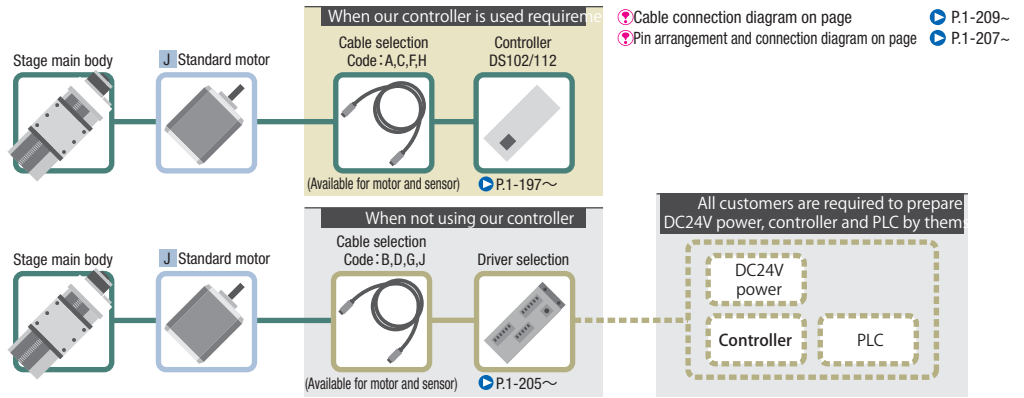
$\phi$ 100

$\phi$ 120

Other

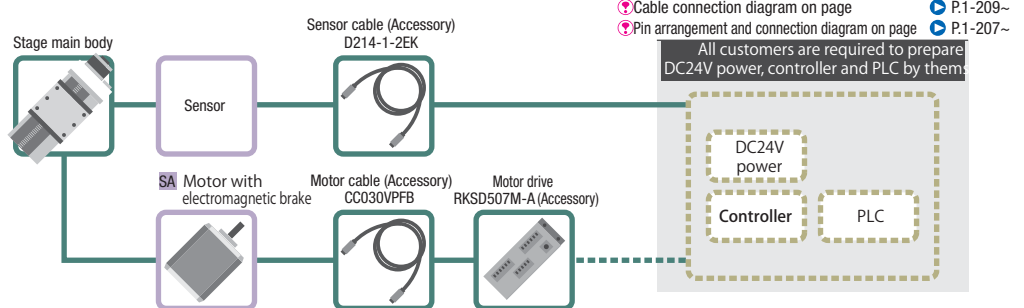
Motor option

**J** Standard motor  
 Motor model  
 PK546PB



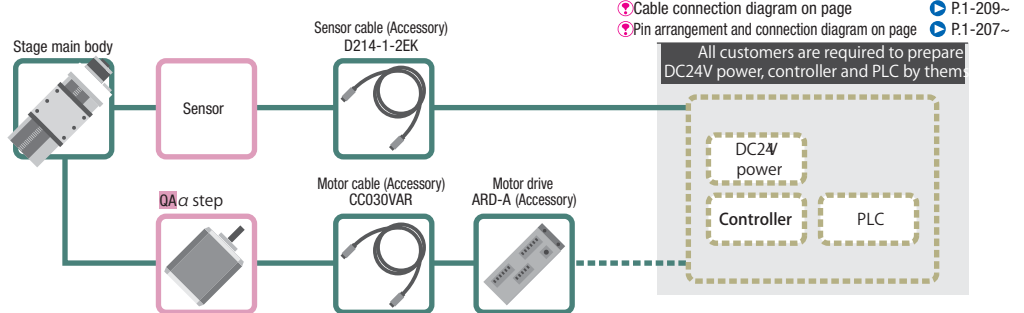
Motor option

**SA** With electromagnetic brake  
 Motor model  
 PKE566MC



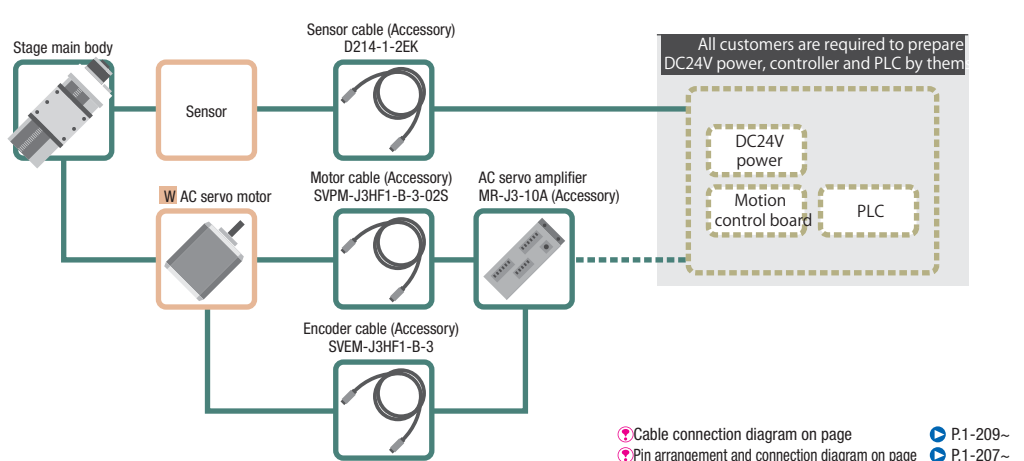
Motor option

**QA** α Step  
 Motor model  
 ARM46AC



Motor option

**W** AC servo motor  
 Motor model  
 HF-KP13



Option Code	J		SA		QA	W
Feature	Standard		With electromagnetic brake		Small step-out	High speed
Type	5 phase stepping motor 0.75A/Phase		5 phase stepping motor 1.4A/Phase		α step motor	AC servo motor
Motor model*	PK546PB		PKE566MC		ARM46AC	HF-KP13
Resolution	lead 5mm	Full/ Half	10μm/5μm		5μm (Set to 1000P/R)	18 bits encoder (262144P/R)
		Micro step (1/20 split)	0.5μm		—	
	lead 10mm	Full/ Half	20μm/10μm		10μm (Set to 1000P/R)	
		Micro step (1/20 split)	1μm		—	
MAX speed	lead 5mm	30mm/sec	140mm/sec	100mm/sec	200mm/sec	
	lead 10mm	50mm/sec	215mm/sec	125mm/sec	400mm/sec	

\*Model is our own management model.

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

128

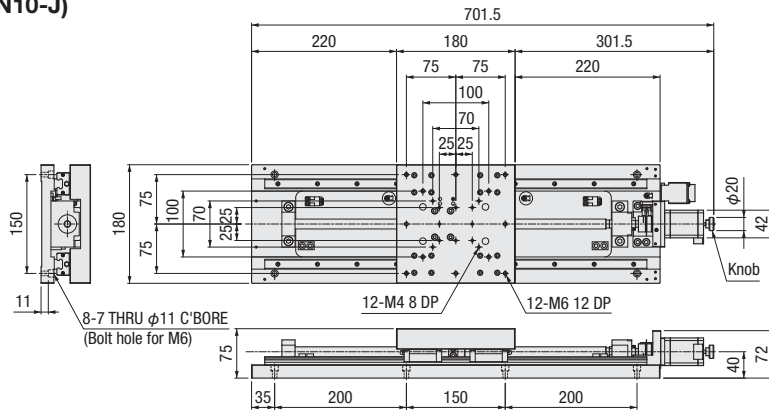
# Motorized Stage

## X-axis Slide Guide: KXS18400/KXS18500

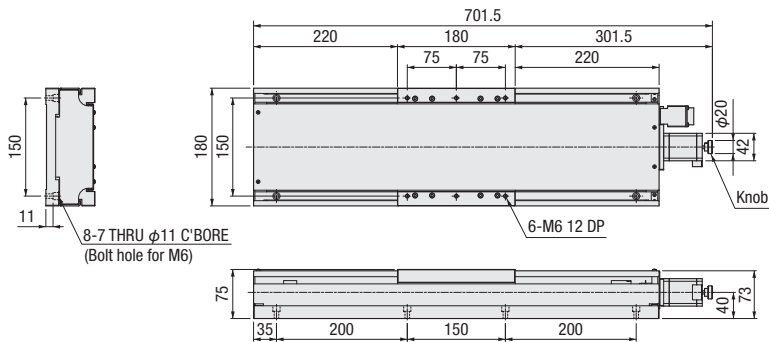
Motorized Stage

### Dimensional outline drawings

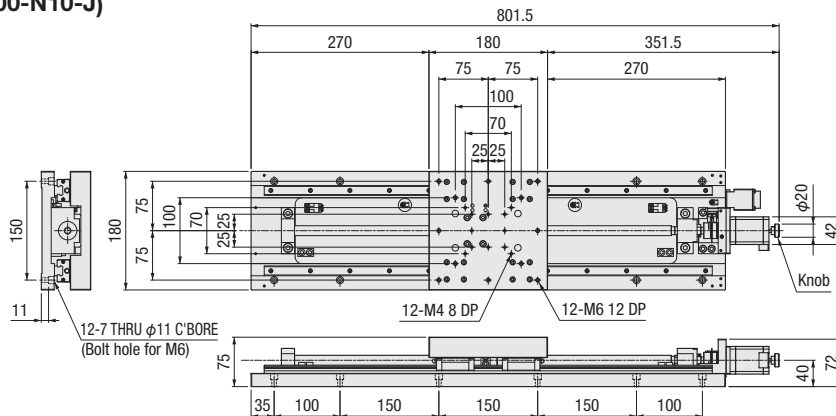
#### KXS18400-N5-J (KXS18400-N10-J)



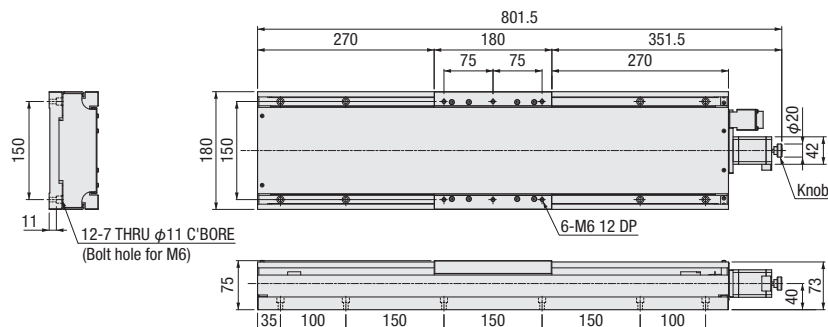
#### KXS18400-C5-J (KXS18400-C10-J)



#### KXS18500-N5-J (KXS18500-N10-J)



#### KXS18500-C5-J (KXS18500-C10-J)



X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear  
Ball

CAVE-X  
Linear ball

Cross  
Roller

Slide  
Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other



PART  
COMMUNITY

CAD  
DATA



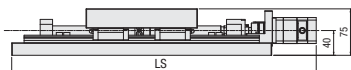
CAD  
3D·2D

Dimensional outline drawings

**J** Standard motor

Motor model PK546PB

That is applicable to  
uncovered and covered

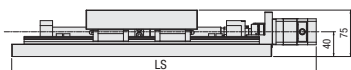


Model	J (Standard)	
	Motor size	LS
KXS18400-□□-J□	□42	702
KXS18500-□□-J□		802

**SA** With electromagnetic brake

Motor model PKE566MC

That is applicable to  
uncovered and covered

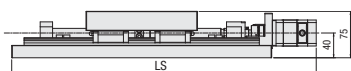


Model	SA (Electromagnetic brake)	J (Standard)	
	Motor size	LS	LS
KXS18400-□□-SAM	□60	725.5	702
KXS18500-□□-SAM		825.5	802

**QA** α step

Motor model ARM46AC

That is applicable to  
uncovered and covered

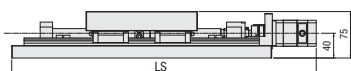


Model	QA (α step)		J (Standard)
	Motor size	LS	LS
KXS18400-□□-QAP	□42	692	702
KXS18500-□□-QAP		792	802

**W** AC servo motor

Motor model HF-KP13

That is applicable to  
uncovered and covered

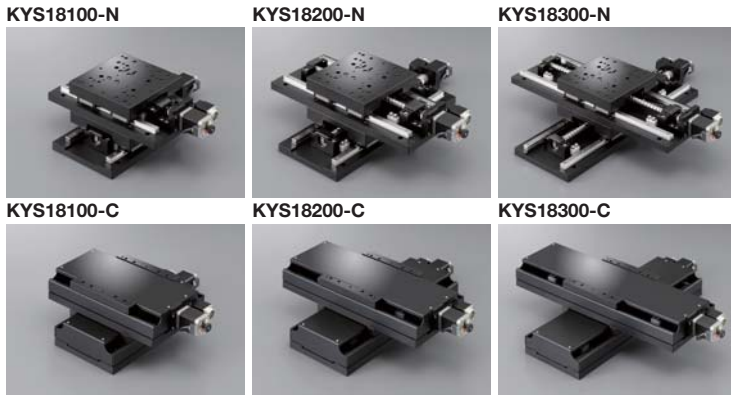


Model	W (Servo motor)		J (Standard)
	Motor size	LS	LS
KXS18400-□□-WU	□40	715	702
KXS18500-□□-WU		815	802



## XY-axis Slide Guide: KYS18100/KYS18200/KYS18300

RoHS



Model Selection code Option code  
**KYS18100-N5-JA**

1 2 3 4 5

▶ Cable P.1-207~  
 ◐ Electrical specification P.1-135~

### 1 Travel length

100	100mm
200	200mm
300	300mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

5	lead 5mm
10	lead 10mm

### 4 Motor option

Code	Specification
J	Standard
SA	With electromagnetic brake (Driver set)
QA	α Step (Driver set)
W	Servo motor (Amplifier set)

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-1-2E
B	2m One end loose	D214-1-2EK
C	4m	D214-1-4E
D	4m One end loose	D214-1-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-1-2R
G	Robot cable 2m one end loose	D214-1-2RK
H	Robot cable 4m	D214-1-4R
J	Robot cable 4m one end loose	D214-1-4RK
M	Cable for electromagnetic brake	—
P	Cable for α step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 Not available non-cable.  
 See page P.1-207, 209~ for details of cable.  
 \* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

Motor/ cable products list	Motor code	Cable code
	J	Blank, A~H, J
	SA	M
	QA	P
W	U	

SPEC							
Model	Uncovered	KYS18100-N5-J	KYS18100-N10-J	KYS18200-N5-J	KYS18200-N10-J	KYS18300-N5-J	KYS18300-N10-J
	Covered	KYS18100-C5-J	KYS18100-C10-J	KYS18200-C5-J	KYS18200-C10-J	KYS18300-C5-J	KYS18300-C10-J
Mechanical specification	Travel length	100mm		200mm		300mm	
	Table size	180×180mm					
	Feed screw (Ball screw)	φ15 lead 5	φ15 lead 10	φ15 lead 5	φ15 lead 10	φ15 lead 5	φ15 lead 10
	Guide	Slide guide					
Accuracy specification	Main materials-Finishing	Aluminum—Black almite finishing					
	Weight	Uncovered	16.64kg	18.96kg	21.44kg		
		Covered	16.24kg	18.74kg	21.4kg		
MAX speed	lead 5	30mm/sec		50mm/sec			
	lead 10	50mm/sec		50mm/sec			
Load capacity		21kgf [205.8N]	20kgf [196N]	19kgf [186.2N]			
	Perpendicularity	Within 50μm/Travel		Within 100μm/Travel		Within 150μm/Travel	
Sensor	Limit sensor	Installed					
	Origin sensor	Installed					
	Slit origin sensor	Installed					
Provided screw (Hexagon-headed bolt)	8 of M6—20						
Slide guide specification	Uni-directional positioning accuracy	Within 15μm		Within 20μm		Within 30μm	
	Repeatability positioning accuracy	Within ±1μm					
	Backlash	Within 2μm					
	Pitching/Yawing	Within 30"/Within 20"		Within 50"/Within 20"		Within 60"/Within 30"	

\* Might be changed specification due to motors. See page P.1-213~ for details.

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

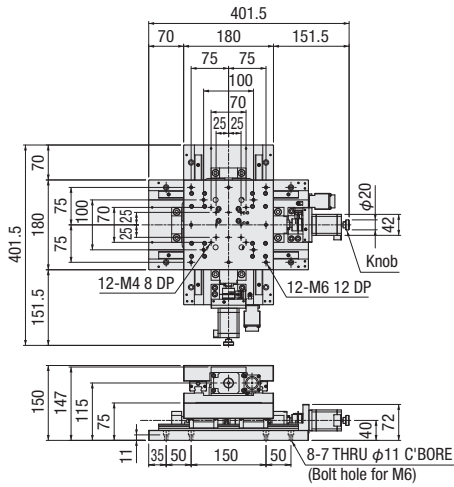
φ100

φ120

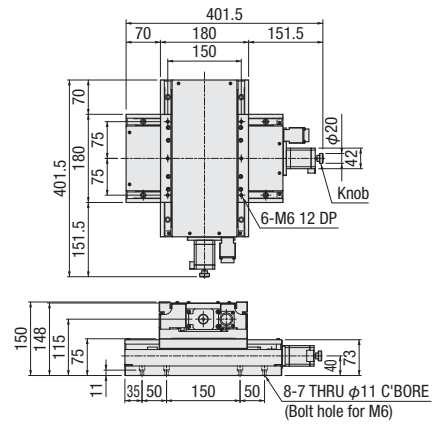
Other

Dimensional outline drawings

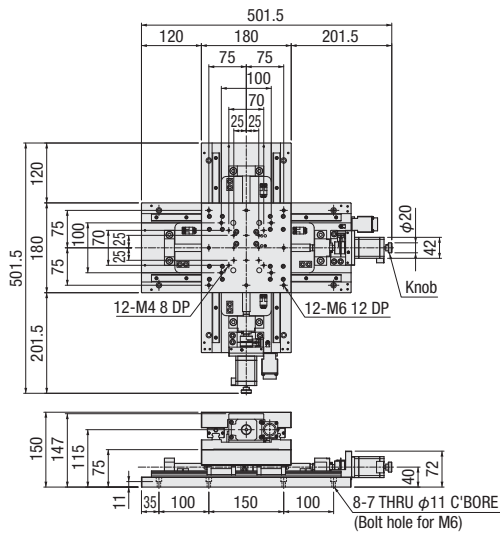
**KYS18100-N5-J (KYS18100-N10-J)**



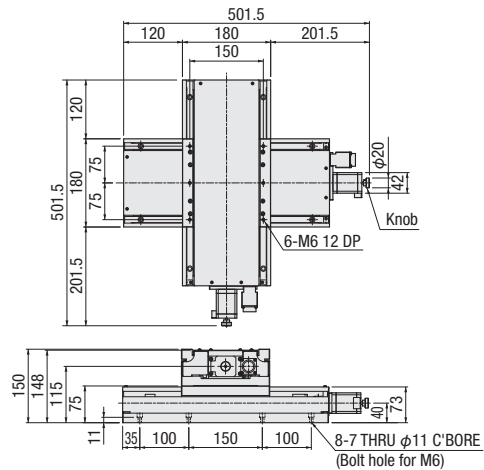
**KYS18100-C5-J (KYS18100-C10-J)**



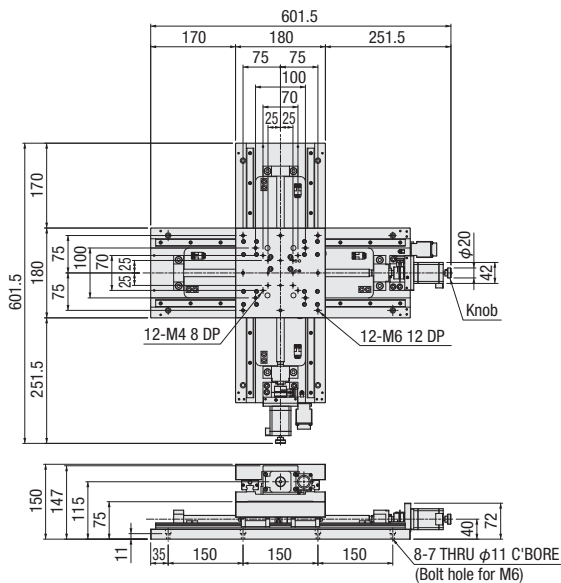
**KYS18200-N5-J (KYS18200-N10-J)**



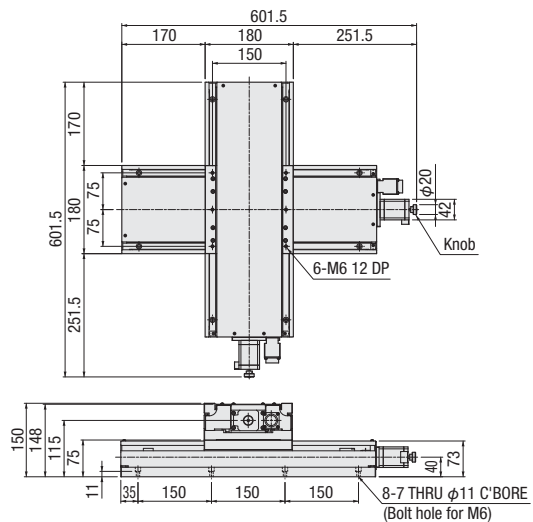
**KYS18200-C5-J (KYS18200-C10-J)**



**KYS18300-N5-J (KYS18300-N10-J)**



**KYS18300-C5-J (KYS18300-C10-J)**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

132

## Z-axis Slide Guide: KZS18100/KZS18200/KZS18300



Model Selection code Option code  
**KZS18100-N5-JA**

1 2 3 4 5

▶ Cable P.1-207~  
 ◻ Electrical specification P.1-135~

### 1 Travel length

100	100mm
200	200mm
300	300mm

### 2 Cover type

N	Uncovered	
C	Covered	

### 3 Ball screw lead selection

5	lead 5mm
---	----------

### 4 Motor option

Code	Specification
J	Standard
SA	With electromagnetic brake (Driver set)
QA	$\alpha$ Step (Driver set)
W	Servo motor (Amplifier set)

\* SA · QA · W included driver and cable.  
 \* See page ▶ P.1-135~ for details of Motor option.

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-1-2E
B	2m One end loose	D214-1-2EK
C	4m	D214-1-4E
D	4m One end loose	D214-1-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-1-2R
G	Robot cable 2m one end loose	D214-1-2RK
H	Robot cable 4m	D214-1-4R
J	Robot cable 4m one end loose	D214-1-4RK
M	Cable for electromagnetic brake	—
P	Cable for $\alpha$ step	—
U	Cable for servo motor	—
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
 \* The price includes M, P and U.  
 Not available non-cable.  
 \* See page ▶ P.1-207~ for details of cable.  
 \* See page Page207, 209~ for more cable details.  
 \* Please select "Code A, C, or F" when connect with stepping motor controller(DS102/112).

[Note]  
 Please check available cable from compatibility list.  
 Not included cable for a main body. Please choose the code as below.

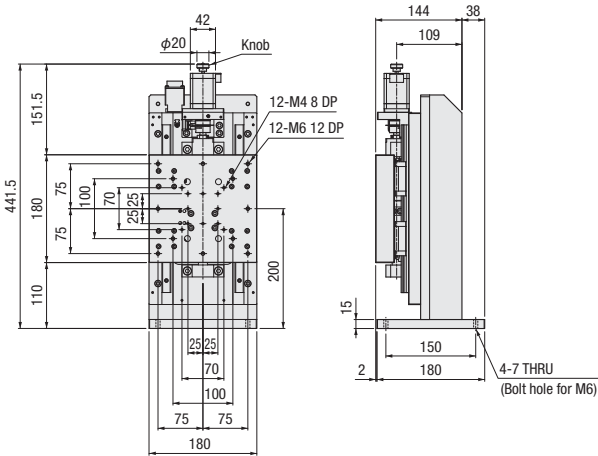
Motor/ cable products list	Motor code	Cable code
	J	Blank, A~H, J
SA	M	
QA	P	
W	U	

SPEC				
Model	Uncovered	KZS18100-N5-J	KZS18200-N5-J	KZS18300-N5-J
	Covered	KZS18100-C5-J	KZS18200-C5-J	KZS18300-C5-J
Mechanical specification	Travel length	100mm	200mm	300mm
	Table size	180×180mm		
	Feed screw (Ball screw)	$\phi$ 15 lead 5		
Main materials-Finishing	Guide	Slide guide		
	Aluminum—Black almite finishing			
	Weight	Uncovered 13.9kg Covered 13.7kg	15.06kg 14.95kg	16.3kg 16.28kg
Accuracy specification	Resolution (Pulse)	10 $\mu$ m/5 $\mu$ m		
	MAX speed	0.5 $\mu$ m (1/20 on resolution) 30mm/sec		
	Load capacity (Excitation)	10kgf [98N]		
Sensor	Vertical degree	Within 50 $\mu$ m/Travel	Within 100 $\mu$ m/Travel	Within 150 $\mu$ m/Travel
	Limit sensor	Installed		
	Origin sensor	Installed		
	Slit origin sensor	Installed		
Provided screw (Hexagon-headed bolt)		4 of M6—25		
Synthetic accuracy specification	Uni-directional positioning accuracy	Within 15 $\mu$ m	Within 20 $\mu$ m	Within 30 $\mu$ m
	Repeatability positioning accuracy	Within $\pm$ 1 $\mu$ m		
	Backlash	Within 2 $\mu$ m		
	Pitching/Yawing	Within 30"/Within 20"	Within 50"/Within 20"	Within 60"/Within 30"

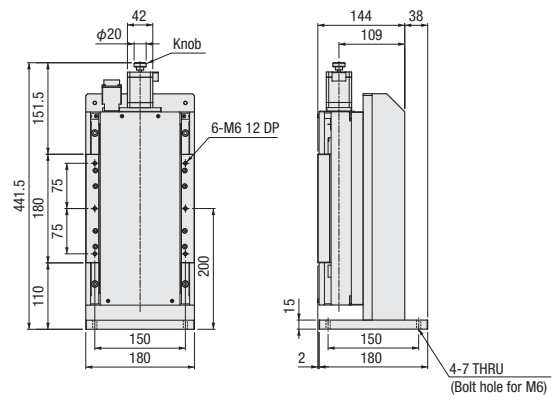
\* Might be changed specification due to motors. See page ▶ P.1-213~ for details.

**Dimensional outline drawings**

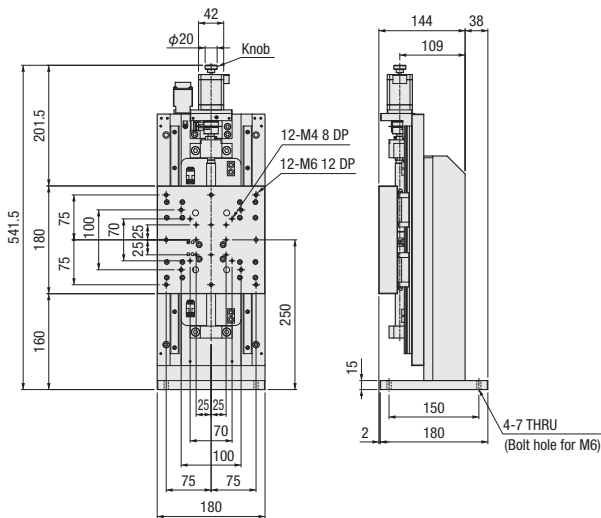
**KZS18100-N5-J**



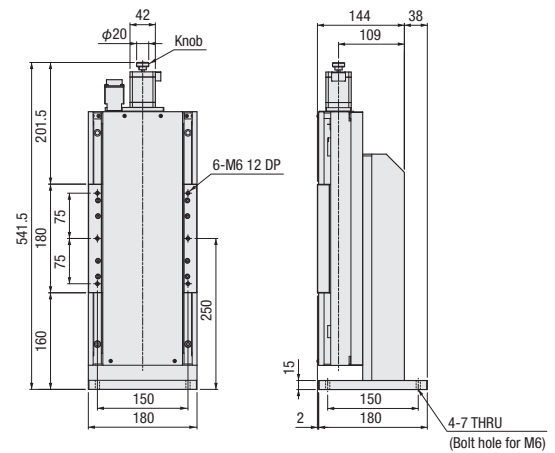
**KZS18100-C5-J**



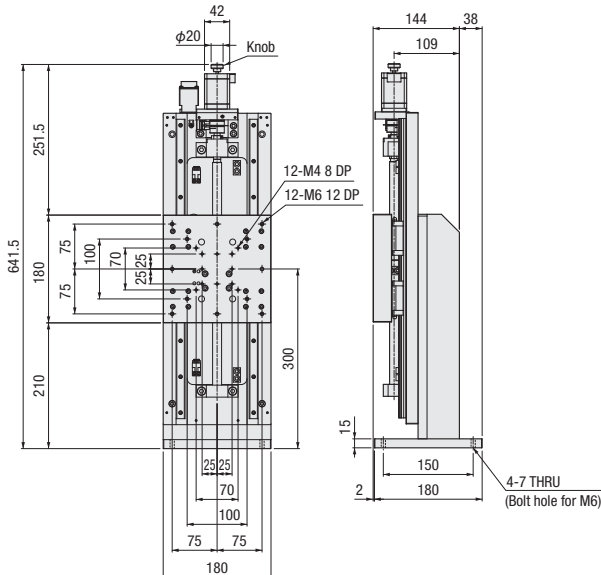
**KZS18200-N5-J**



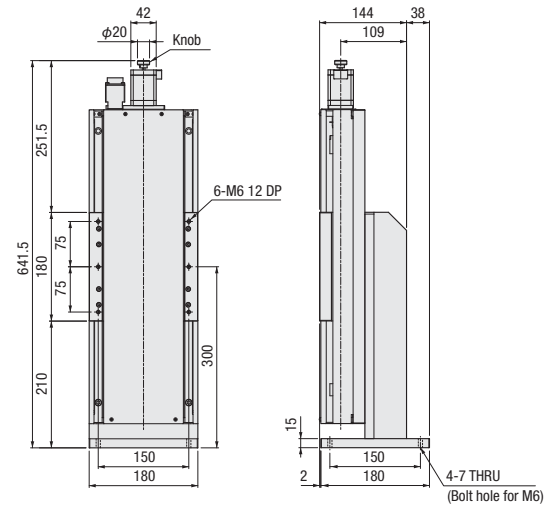
**KZS18200-C5-J**



**KZS18300-N5-J**



**KZS18300-C5-J**



Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

134

## Electrical Specification: KXS Series

### Motor · Electrical specification

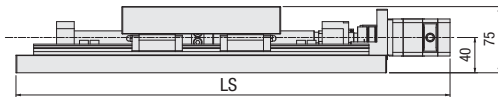
Motor code		J	SA	QA	W			
Models		KXS18100 / KXS18200 / KXS18300 / KXS18400 / KXS18500						
Motor Specification (*1)	Type	5 phase stepping motor 0.75A/Phase	5 phase stepping motor 1.4A/Phase	$\alpha$ step motor	AC servo motor			
	Feature	Standard	With electromagnetic brake	Small step-out	High speed			
	Model (*2)	PK546PB	PKE566MC	ARM46AC	HF-KP13			
	Electromagnetic brake	—	Installed	—	—			
	Maker	Oriental Motor Co.,Ltd.			Mitsubishi Electric corporation			
	Step angle (Position detector)	0.72°			18 bits encoder (262144P/R)			
	Mass	0.5kg	1.1kg	0.5kg	0.56kg			
	Motor size	□ size	42mm	60mm	42mm	40mm		
		L size	74mm	99.5mm	64.9mm	82.4mm		
	Excitation (moment) maximum torque	0.42N · m	0.83N · m	0.3N · m	0.95N · m			
Driver type	▶ P.1-205~	RKSD507-MA	ARD-A	MR-J3-10A				
Input power (Voltage · frequency)	▶ P.1-205~	Single phase AC100-115V 50/60Hz	Single phase AC100-115V 50/60Hz	Three and single phase AC200-230V 50/60Hz				
Sensor	Limit sensor	Installed						
	Origin sensor	Installed						
	Slit origin sensor	Installed						
	Model	Photo microsensor EE-SX674 (Omuron Co.,Ltd.)						
	Power voltage	DC5~24V ±10%						
	Consumption current	140mA or less (35mA or less per 1 sensor)						
	Control output	NPN open collector output DC5~24V 100mA or less Residual voltage 0.8V or less when the load current is 100mA Residual voltage 0.4V or less when the load current is 40mA						
Output logic	Limit, Origin sensor on detection (light shield condition): Output transistor OFF (Non-continuity) (Slit origin sensor is OFF when detected. (Non-continuity))							
Connector	Motor	Model	SRCN2A21-16P (JAE)	350782-1 (Tyco Electronics Japan G.K.)	5557-10R (Japan Molex)	Motor cable	—	
		Receiving connector	SRCN6A21-16S (JAE)	350720-1 (Tyco Electronics Japan G.K.)	5559-10P (Japan Molex)	Motor cable	JN4FT04SJ1-R (JAE)	
	Sensor	Model	SRCN2A21-16P (JAE)				Encoder cable	1674320-1 (Tyco Electronics Japan G.K.)
		Receiving connector	SRCN6A21-16S (JAE)				Encoder cable	—
Accuracy specification	Resolution	lead 5mm	10 $\mu$ m/5 $\mu$ m		5 $\mu$ m/2.5 $\mu$ m		18 bits encoder (262144P/R)	
		Microstep	0.5 $\mu$ m (1/20 on resolution)		—			
	lead 10mm	Full/Half	20 $\mu$ m/10 $\mu$ m		10 $\mu$ m/5 $\mu$ m			
		Microstep	1 $\mu$ m (1/20 on resolution)		—			
	MAX speed	lead 5mm	30mm/sec	140mm/sec	100mm/sec	200mm/sec		
		lead 10mm	50mm/sec	215mm/sec	125mm/sec	400mm/sec		

\*1 See page ▶ P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

\* The electric specification of XY(PMG), Z(PZG) are the same.

### Dimensional outline drawings



Motor code	Size □ [mm]	LS				
		KXS18100	KXS18200	KXS18300	KXS18400	KXS18500
J	42	402	502	602	702	802
SA	60	422.5	525.5	625.5	725.5	825.5
QA	42	395	495	595	695	795
W	(40)	415	515	615	715	815

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

Pin allocation · Connection diagram

Motor code	KXS series	Motor code	KXS series																																																				
J	<p>[Motor and sensor pin allocation (the same)]</p> <p>1 Motor lead (Blue) 2 Motor lead (Red) 3 Motor lead (Orange) 4 Motor lead (Green) 5 Motor lead (Black) 6 CWLS output 7 Open 8 CCWLS output 9 Open 10 Power input (+) 11 NORG output 12 Open 13 Open 14 ORG output 15 Power input (-) 16 F.G.</p>	SA	<p>[Motor and sensor pin allocation (motor)]</p> <p>1 Motor lead (Blue) 2 Motor lead (Red) 3 Motor lead (Orange) 4 Motor lead (Green) 5 Motor lead (Black) 6 Open 7 Open 8 Power input (+) 9 Power input (-)</p> <p>* Type of cable: CC030VPFB See page P.1-211 for details.</p>																																																				
	<p>Available for motor and sensor</p>		<p>[Motor and sensor pin allocation (sensor)]</p> <p>1 Open 2 Open 3 Open 4 Open 5 Open 6 CWLS output 7 Open 8 CCWLS output 9 Open 10 Power input (+) 11 NORG output 12 Open 13 Open 14 ORG output 15 Power input (-) 16 F.G.</p> <p>* Type of cable: D214-1-2EK See page P.1-212 for details.</p>																																																				
QA	<p>※Motor cable model:CC030VAR See page P.1-211 for details.</p> <p>Driver side: Pin 1 (White), 2 (Purple), 3 (Red), 4 (Blue), 5 (Black), 6 (Brown), 7 (Green), 8 (Yellow), 9 (Shield), 10 (Shield)</p> <p>Motor side: Pin 1 (White), 2 (Purple), 3 (Red), 4 (Blue), 5 (Black), 6 (Brown), 7 (Green), 8 (Yellow), 9 (Shield), 10 (Shield)</p>	W	<p>Motor cable type: SVPM-J3HF1-B-3-02S Encoder cable type: SVEM-J3HF1-B-3 See page P.1-211 for details. * An above cable is an accessory.</p> <p><b>SVPM-J3HF1-B-3-02S</b></p> <table border="1"> <tr><th colspan="2">Servo amplifier side</th><th colspan="2">Motor side</th></tr> <tr><td>Mark</td><td>Green / Yellow</td><td>Pin 1</td><td>Signals</td></tr> <tr><td>FG</td><td>White</td><td>2</td><td>FG</td></tr> <tr><td>U</td><td>Red</td><td>3</td><td>UPhase</td></tr> <tr><td>V</td><td>Blue</td><td>4</td><td>VPhase</td></tr> <tr><td>W</td><td>Black</td><td></td><td>WPhase</td></tr> </table> <p><b>SVEM-J3HF1-B-3</b></p> <table border="1"> <tr><th colspan="2">Servo amplifier side</th><th colspan="2">Motor (encoder) end</th></tr> <tr><td>PS</td><td>White</td><td>Pin 3</td><td>PS</td></tr> <tr><td>LB</td><td>Black</td><td>6</td><td>LB</td></tr> <tr><td>MR</td><td>Red</td><td>5</td><td>MR</td></tr> <tr><td>MRR</td><td>Black</td><td>4</td><td>MRR</td></tr> <tr><td>BAT</td><td>Green</td><td>2</td><td>BAT</td></tr> <tr><td>SD</td><td>Shield</td><td>9</td><td>SD</td></tr> </table>	Servo amplifier side		Motor side		Mark	Green / Yellow	Pin 1	Signals	FG	White	2	FG	U	Red	3	UPhase	V	Blue	4	VPhase	W	Black		WPhase	Servo amplifier side		Motor (encoder) end		PS	White	Pin 3	PS	LB	Black	6	LB	MR	Red	5	MR	MRR	Black	4	MRR	BAT	Green	2	BAT	SD	Shield	9	SD
	Servo amplifier side		Motor side																																																				
Mark	Green / Yellow	Pin 1	Signals																																																				
FG	White	2	FG																																																				
U	Red	3	UPhase																																																				
V	Blue	4	VPhase																																																				
W	Black		WPhase																																																				
Servo amplifier side		Motor (encoder) end																																																					
PS	White	Pin 3	PS																																																				
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MR	Red	5	MR																																																				
MRR	Black	4	MRR																																																				
BAT	Green	2	BAT																																																				
SD	Shield	9	SD																																																				
<p>[Motor and sensor pin allocation (sensor)]</p> <p>1 Open 2 Open 3 Open 4 Open 5 Open 6 CWLS output 7 Open 8 CCWLS output 9 Open 10 Power input (+) 11 Open 12 Open 13 Open 14 ORG output 15 Power input (+) 16 F.G.</p> <p>* Type of cable: D214-1-2EK See page P.1-212 for details.</p>	<p>[Motor and sensor pin allocation (sensor)]</p> <p>1 Open 2 Open 3 Open 4 Open 5 Open 6 CWLS output 7 Open 8 CCWLS output 9 Open 10 Power input (+) 11 Open 12 Open 13 Open 14 ORG output 15 Power input (-) 16 F.G.</p> <p>* Type of cable: D212-1-2EK See page P.1-212 for details.</p>																																																						

Cable type

Code	Specification	Cable type
A	2m	D214-1-2E
B	2m One end loose	D214-1-2EK
C	4m	D214-1-4E
D	4m One end loose	D214-1-4EK
F	Robot cable 2m	D214-1-2R
G	Robot cable 2m one end loose	D214-1-2RK
H	Robot cable 4m	D214-1-4R
J	Robot cable 4m one end loose	D214-1-4RK

Cable connection diagram shows page P.1-207~  
Great deal purchase both of cable and code.

Motorized Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Linear Ball

CAVE-X Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

φ100

φ120

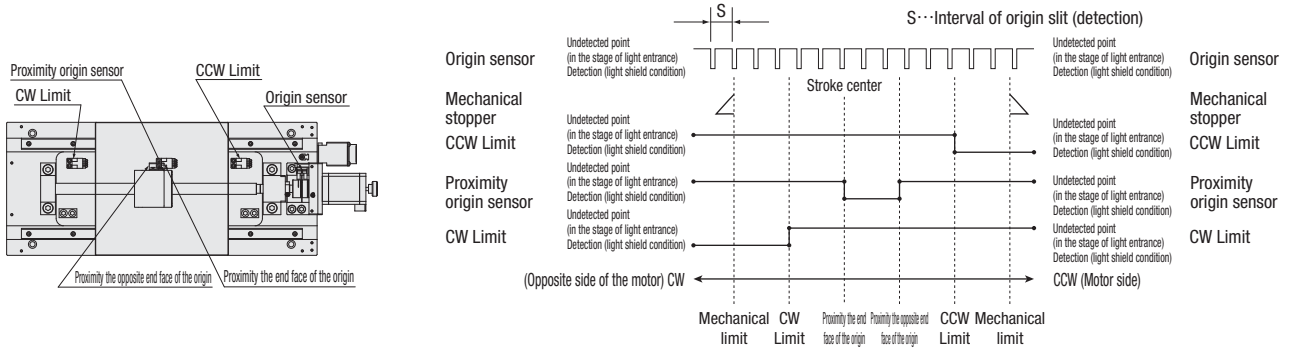
Other

1

136

## Electrical Specification: KXS Series

### Timing chart



Unit [mm]	Direction of CW		Direction of CCW				
	Reference coordinate	Mechanical limit	CW Limit	The proximity origin end face Stroke center	Proximity origin Opposite end face	CCW Limit	Mechanical limit
<b>KXS18100</b>	Return to origin	54	51	0	20	51	54
<b>KXS18200</b>	Return to origin	104	101	0	20	101	104
<b>KXS18300</b>	Return to origin	154	151	0	20	151	154
<b>KXS18400</b>	Return to origin	204	201	0	20	201	204
<b>KXS18500</b>	Return to origin	254	251	0	20	251	254
<b>The same</b>	Detection clearance of slit origin S=5 and 10 (By ball screw lead)						

- \* Applicable for motor code J and S.
- \* Return to origin means that is performed return to origin type 1 using DS102/DS112 series.
- \* Origin becomes any position till the origin sensor is detected shielded disk slit of the origin side after through the proximity end face.
- \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

Linear Ball

CAVE-X  
Linear ball

Cross Roller

Slide Guide

φ40

φ50

φ60

φ70

φ80

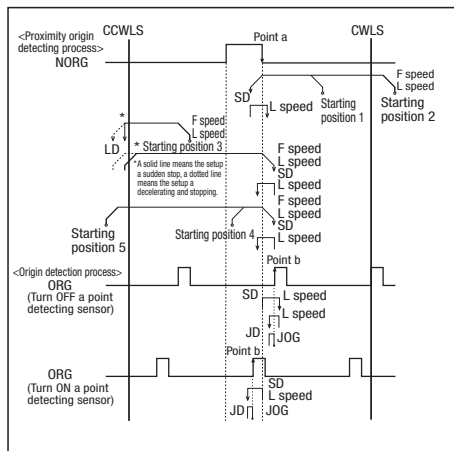
φ100

φ120

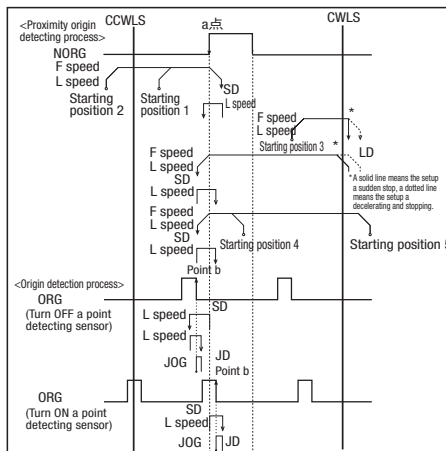
Other

**KXS series recommendation return to origin method**

**[Type 1]** Detect in the direction of CCW and perform detected process for CW edge (point a) of NORG signal. Next detect an edge of CCW side (point b) of ORG signal.



**[Type 2]** Detect in the direction of CW and perform detected process for CCW edge (point a) of NORG signal. Next detect on edge of CW side (point b) of ORG signal.



**[Type 7]**

After finished type1, perform detected process for CCW edge (point c) of TIMING signal.

**[Type 8]**

After finished type2, perform detected process for CW edge (point c) of TIMING signal.

Return to origin sequence ▶ P.1-201~

**Adaptive driver**

■ Driver ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	Micro step (1~1/250 [16 steps])	Normal (Full/Half)

AC100V input

Model	RKD507-A
Divisions	Micro step (1~1/250 [16 steps])

**Adaptive stepping motor controller**

■ Controller ▶ P.1-197~

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other



## Motorized Goniometer Stage Guidance



This is the arc driving stage which has center of rotation on the vertical centroid of the stage surface.

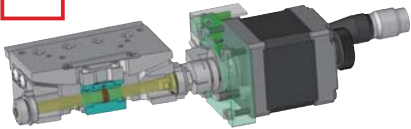
### Usage

- Repeat positioning of minute angle in the optical pickup adjustment and inspection equipment.
- Parts posture adjusting for assembly process and mounting line.
- Available bonding camera lens and LCD panel together in production and inspection.

### The focus of setting

#### Ball screw type

Original



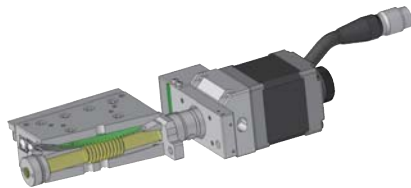
#### KGB/KAB Sinmotion Stage

▶P.1-145~

High precision goniometer stage for driving minute angle repeatability. Ball screw type is improved durability even continuing repeatability driving.

Table size	60×60mm	70×70mm

#### Worm type



#### KG/KA/KGW/KAW

▶P.1-149~

Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism. Selectable from various sizes and work distance type.

Table size	40×40mm	50×50mm	60×60mm	70×70mm

#### ■ Sensor improvements

KGW and KAW series correspond to a voltage level of DC5V through 24V.

### List of rotation centroid height

- Shows rotation centroid height for each stage surface.
- Mark of blue centroid can be integrated 2-axis.

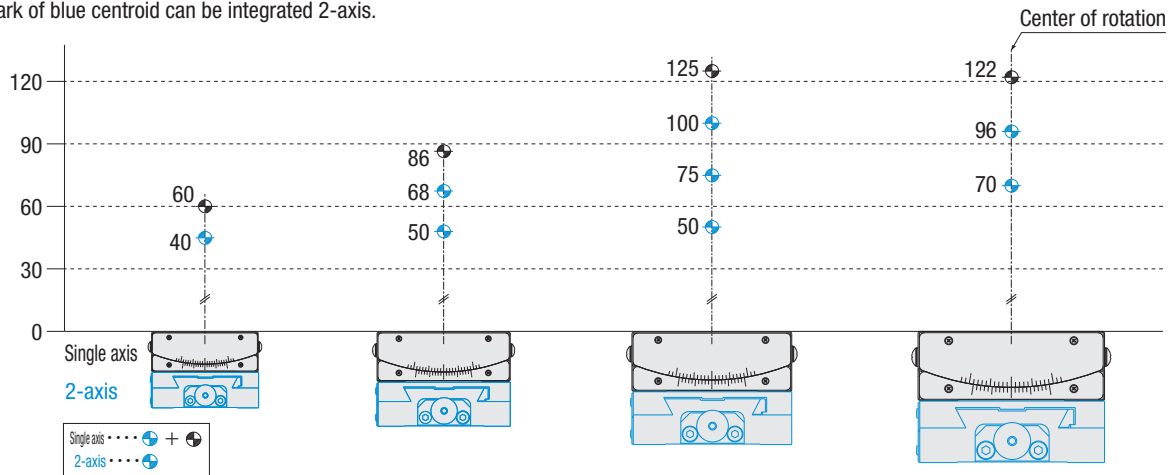


Table size	40×40	50×50	60×60	70×70
Ball screw type	—	—	—	○
Worm type	○	○	○	○

## Ball bearing type sinemotion goniometer stages

High precision goniometer stages with ball bearings. This is ideal for driving a minute angle repeatability.

### Features



#### High endurance

Backlash by the abrasion was concerned about by the worm gear type when continued being driven at a microangle repeatedly.  
Ball screw mechanism makes evaluation high durability.

#### Improvement acceleration and deceleration

Smooth start-up and acceleration with small friction.

#### Reduction backlash

Using the preload parts may reduced backlash.

#### Travel length and isokinetic

The linear-driven will be changed to rotation-moving by using the internal bearing.  
Ball screw traveling length will not be the same as stage travel angle due to linear-moving converts to rotation-moving.  
It is different resolution per pulse at the center and end.  
Rotation speed will not be constant even with the send of pulse signal at the constant speed.

#### Travel range calculation fomula

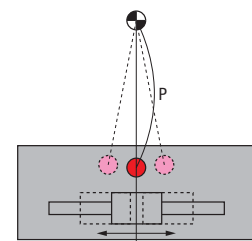
\* The fomula based on the stroke center.

(1) Travel angle =  $\text{Arcsin}(\text{Input pulse} \cdot X) / P$  (2) Input pulse =  $P \cdot \sin(\text{Traveling angle}) / X$

#### Terms

Definition	Value	Unit
Distance between supporting points P*	76	mm
Ball screw lead	1	mm
Motor basic step angle	0.72	°
Ball screw travel length per pulse X	0.002	mm

\*Distance between supporting points depending on the stage.



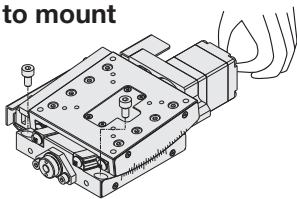
P=Distance between supporting points  
(The distance between center rotation and bearing)

#### Basic Specification

Model	Motor basic step angle	Distance between supporting points P
KGB06050	0.72°	55mm
KGB06075	0.72°	80mm
KGB06100	0.72°	105mm
KGB06125	0.72°	130mm
KGB07070	0.72°	76mm
KGB07096	0.72°	102mm
KGB07122	0.72°	128mm

## For use correctly

### How to mount



Stroke the upper plate to CW or CCW.  
Screw on bolt holes for each 2. (Total 4 screws)  
Tighten the screws by manual.

### About object on the upper or lower stage.

Stage surface might be deformed and Mounting unflat object and set to the unflat place can affect to be deformed stage surface and decreasing accuracy.  
Pay attention. [Approximate flatness: 10μm Within]

### Position of stage mounting

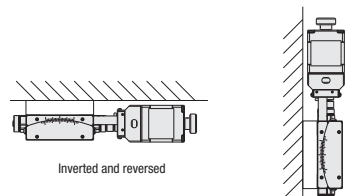
All products SPEC shows must be shown flat setting condition.  
Pay attention to mount such as up side down, vertical on the side and horizontal on the side.  
Load capacity and accuracy might be changed by the positioning.  
Please feel free to ask us for more information.

### Each positioning characteristics

Travel guide [Feeding method]	Inverted and reversed	Side horizontal	Side vertical use
Crossed roller [Ball screw]	○	○	△
Crossed roller [Worm gear]	○	○	△

○ means usable, however load and moment is limited.

△ Load and moment is limited, it may not lose characteristics in some usage or models.



Side vertical use

## Run-out accuracy of the center of rotation/Height of the center of rotation

Our cross roller goniometer stages are providing high-precision machining.

### Run-out accuracy of the center of rotation

Put the true sphere on the level of the center of rotation, and define the true sphere run-out as run-out accuracy of the center of rotation.

### Height of the center of rotation

Height of the center of rotation is between upper side of stage and center of roundness.

## Ball Screw Type Sinemotion Goniometer Stages □60:KGB06/KAB06

New

Motorized goniometer stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

■ 1-axis  
KGB06075AL (KGB06 series)



■ 2-axis  
KAB06075AL (KAB06 series)



Freely customize the motor

Original RoHS

※ Can be used for KGB  
● See page P.009

■ High precision goniometer stages with ball bearings. This is ideal for driving a minute angle repeatability.

■ Configuration 2-axis  
Combination of 1-axis stage that is different center of rotation.



● Cable P.1-207~  
● Electrical specification P.1-143~

### 1 Axis

G	1-axis
A	+

### 2 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm
125	125mm

### 3 Sensor logic

Code	Specification
L	L position
R	Opposite hand

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

See page ● 1-207, 209~ for details of cable.

\* Please select "Code A, C, F, or H" when connect with stepping motor controller (DS102/112).

## SPEC

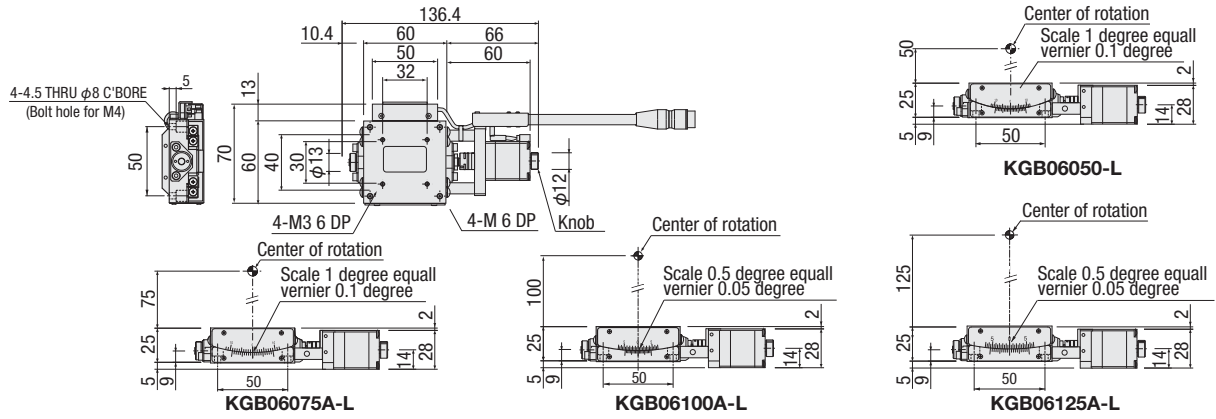
Number of axes	1-axis							2-axis		
	KGB06050-L	KGB06075-L	KGB06100-L	KGB06125-L	KAB06050-L	KAB06075-L	KAB06100-L	KAB06050-R	KAB06075-R	KAB06100-R
Model	KGB06050-L	KGB06075-L	KGB06100-L	KGB06125-L	KAB06050-L	KAB06075-L	KAB06100-L	KAB06050-R	KAB06075-R	KAB06100-R
(Opposite hand)	KGB06050-R	KGB06075-R	KGB06100-R	KGB06125-R	KAB06050-R	KAB06075-R	KAB06100-R	KAB06050-R	KAB06075-R	KAB06100-R
Travel length Upper/Lower axis	±8.5°	±5.5°	±5°	±4°	±8.5°/±5.5°	±5.5°/±5°	±5°/±4°	±8.5°/±5.5°	±5.5°/±5°	±5°/±4°
Table size	60×60mm									
Travel mechanism	Ball screw φ6 lead 1									
Guide	Crossed roller guide									
Main materials-Finishing	Aluminum—Black almite finishing									
Weight	0.5kg				1.0kg					
Height of stage	25±0.2mm				50±0.4mm					
Height of center rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm	50±0.4mm	75±0.4mm	100±0.4mm	50±0.4mm	75±0.4mm	100±0.4mm
Runout accuracy of center rotation	Within 0.01mm									
Resolution (Pulse)*	Upper at the full Lower at the full	≒0.0021° ≒0.0014°	≒0.0014° ≒0.0011°	≒0.0011° ≒0.0009°	≒0.0021° ≒0.0014°	≒0.0014° ≒0.0011°	≒0.0011° ≒0.0009°	≒0.0021° ≒0.0014°	≒0.0014° ≒0.0011°	≒0.0011° ≒0.0009°
MAX speed**	Upper Lower	10.5°/sec [15kHz] 7°/sec [15kHz]	7°/sec [15kHz] 5.5°/sec [15kHz]	5.5°/sec [15kHz] 4.5°/sec [15kHz]	10.5°/sec 7°/sec	7°/sec 5.5°/sec	5.5°/sec 4.5°/sec	10.5°/sec 7°/sec	7°/sec 5.5°/sec	5.5°/sec 4.5°/sec
Repeatability positioning accuracy	±0.001°									
Load capacity	5kgf [49N]				4.5Kg [44.1N]					
Moment stiffness	Pitch 0.30/yaw 0.10/roll 0.11 ["/N·cm]				Pitch 0.41/yaw 0.2/roll 0.41 ["/N·cm]					
Lost motion	Within 0.003°				Within 0.003°					
Back Rush Within 0.003°	Within 0.003°				Within 0.003°					
Limit sensor	—				Installed					
Origin sensor	—				Installed					
Slit origin sensor	—				—					
Provided screw (Hexagon-headed bolt)	—				4 of M4—10					

\* See page 1-169 if you require exact calculations. ● 1-140 if you require exact calculations.

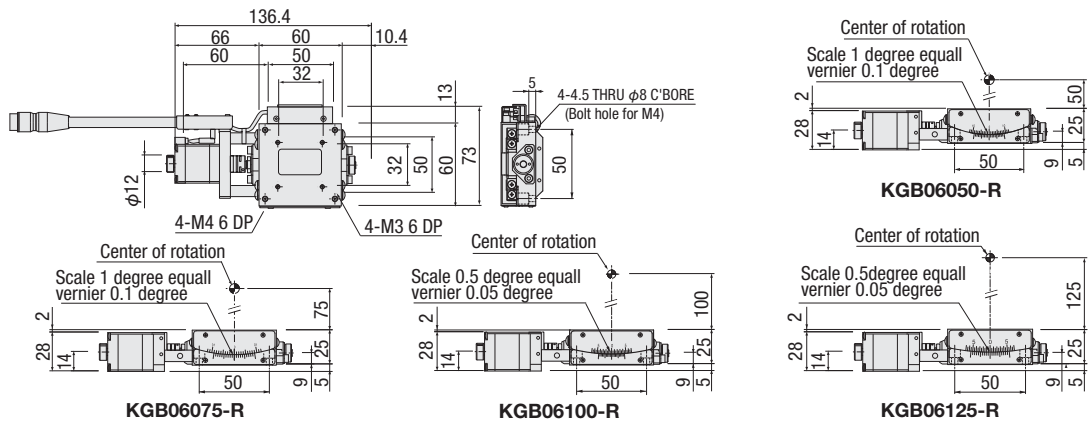
\*\*The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

Dimensional outline awings(1-axis )

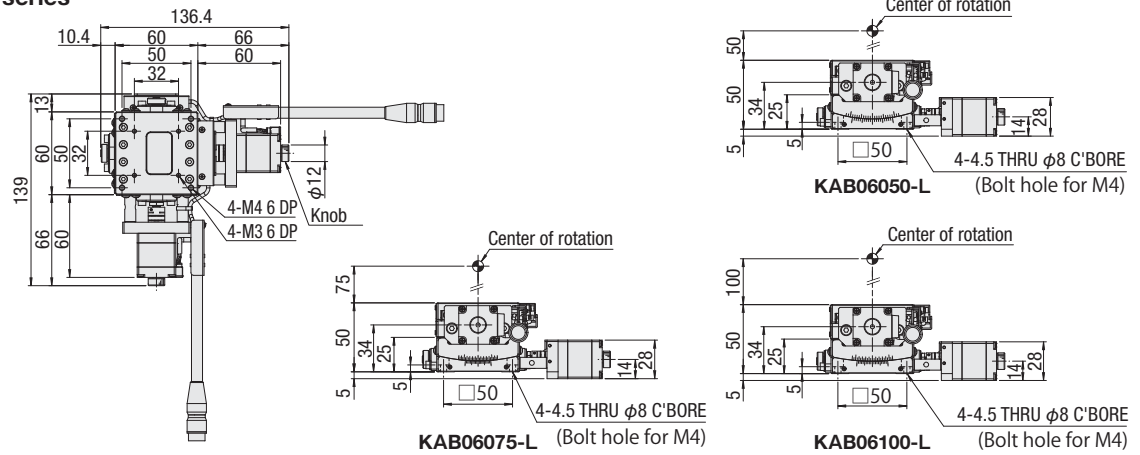
KGB06-L series



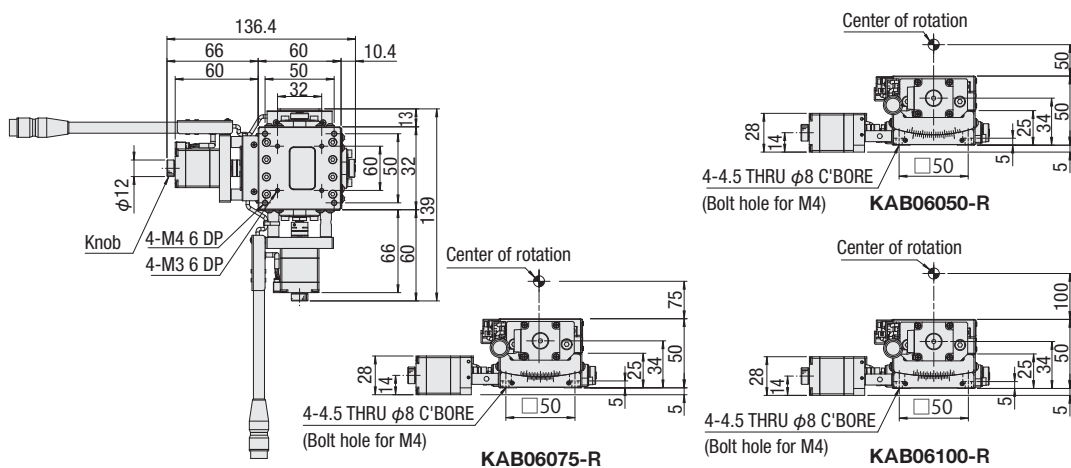
KGB06-R series (Opposite hand)



KAB06-L series



KAB06-R series (Opposite hand)



New

Motorized goniometer  
Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Ball Screw

Worm Gear

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

New

Motorized goniometer Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Other

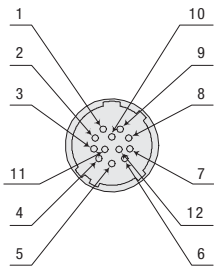
### Electrical specification

Model		KGB06050-L	KGB06075-L	KGB06100-L	KGB06125-L	KAB06050-L	KAB06075-L	KAB06100-L
Opposite hand		KGB06050-R	KGB06075-R	KGB06100-R	KGB06125-R	KAB06050-R	KAB06075-R	KAB06100-R
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)						
	Model (*2)	C005C-90215P						
	Step angle	0.72°						
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)						
	Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)						
Sensor	Limit sensor	Installed						
	Origin sensor	Installed						
	Slit origin sensor	-						
	Model	Photo microsensor EE-SX4134 (Omuron Co.,Ltd.)						
	Power voltage	DC5~24V ±10%						
	Consumption current	Total 60mA or less						
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA						
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)							

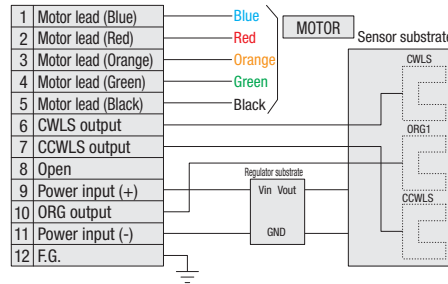
\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

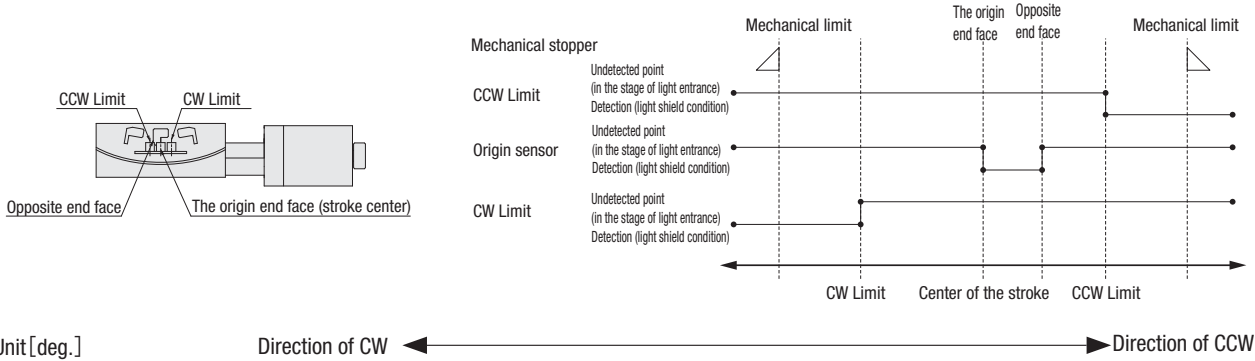
### Pin allocation



### Connection diagram



### Timing chart



\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.

Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly.

Set to the way of recommendation return origin when using our controller.

**KGB06/KAB06 recommended return to origin Return to origin sequence P.1-201~**

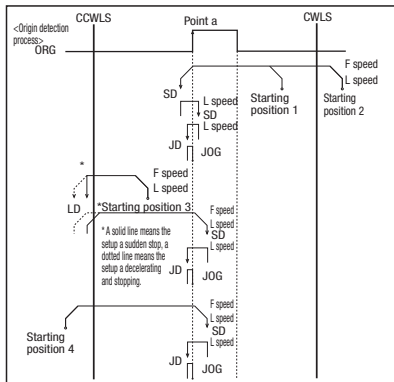
Type 3: Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.

Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.

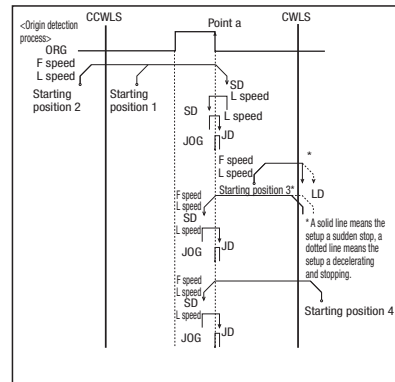
Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.

Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

<b>Model</b>	<b>CRD5107P</b>	<b>SD5107P3-A22</b>
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

<b>Model</b>	<b>RKD507-A</b>
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/ output port	Driver type	
		Full/Half	1~1/250[16 steps]
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102

## Ball Screw Type Sinemotion Goniometer Stage □70: KGB07/KAB07

■1-axis  
KGB07070AL (KGB07 series)



■2-axis  
KAB07070AL (AB07 series)



High precision goniometer stages with ball bearings.  
This is ideal for driving a minute angle repeatability

■Configuration 2-axis  
Combination of 1-axis stage that is different center of each rotation.

Model Selection code Option code

**K** **GB07070**     -  

1 2 3 4 5

▶ Cable P.1-207~  
▶ Electrical specification P.1-147~

### 1 Axis

G	1-axis
A	2-axis

### 2 Height of center rotation (W.D)

070	70mm
096	96mm
122	122mm

\* KAB07 is available only for W.D70, 90mm.

### 3 Sensor logic

Type	CWLS	ORG1	CCWLS	ORG2
A	NC	NC	NC	NO
B	NO	NO	NO	
C	NC	NO	NC	

### 4 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page ▶ P.1-207, 209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

SPEC							
Number of axis		1-axis			2-axis		
Model		KGB07070AL	KGB07096AL	KGB07122AL	KAB07070AL	KAB07096AL	
(Opposite hand)		KGB07070AR	KGB07096AR	KGB07122AR	KAB07070AR	KAB07096AR	
Mechanical specification	Travel length Upper/Lower axis	±5°	±4°	±3°	±5°/±4°	±4°/±3°	
	Table size	70×70mm					
	Travel mechanism	Ball screw φ6 lead 1					
	Guide	Crossed roller guide					
Dimensional tolerance	Main materials-Finishing	Aluminum—White almite finish					
	Weight	0.7kg			1.4kg		
	Height of stage	26±0.2mm			52±0.4mm		
Accuracy specification	Height of center rotation	70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm	
	Runout accuracy of center rotation	Within 0.01mm					
	Resolution (Pulse)	Upper at the full	≒0.0015°	≒0.0011°	≒0.0009°	≒0.0015°	≒0.0011°
		Lower at the full				≒0.0011°	≒0.0009°
	MAX speed	Upper	23°/sec [15kHz]	17°/sec [15kHz]	13°/sec [15kHz]	23°/sec [15kHz]	17°/sec [15kHz]
		Lower				17°/sec [15kHz]	13°/sec [15kHz]
Repeatability positioning accuracy	Within ±0.003°						
Sensor	Load capacity	5kgf [49N]			4kgf [39.2N]		
	Moment stiffness	Pitch 0.28/yaw 0.06/roll 0.06 ["/N·cm]			Pitch 0.34/yaw 0.12/roll 0.34 ["/N·cm]		
	Lost motion	Within 0.003°					
	Limit sensor	Installed					
Provided screw (Hexagon-headed bolt)	Origin sensor	Installed					
	Slit origin sensor	Installed					

\*See page ▶ P.1-140 if you require exact calculations.

\*The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

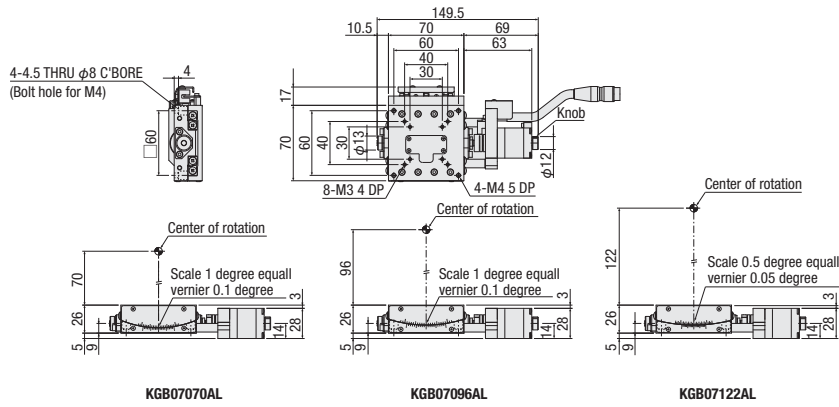
φ100

φ120

Other

Dimensional outline drawings

KGB07-L series

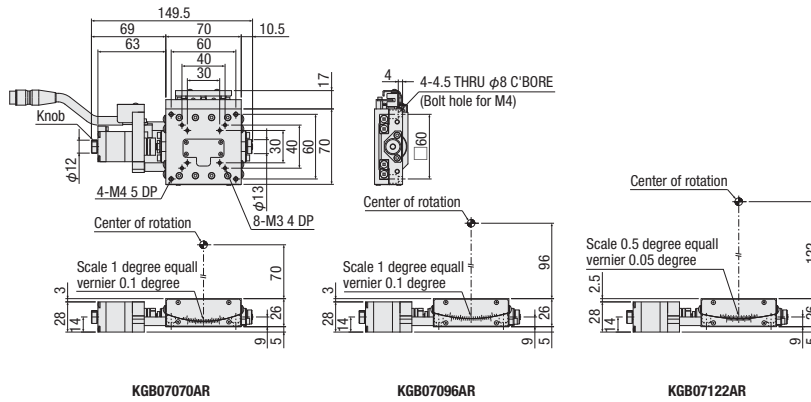


KGB07070AL

KGB07096AL

KGB07122AL

KGB07-R series



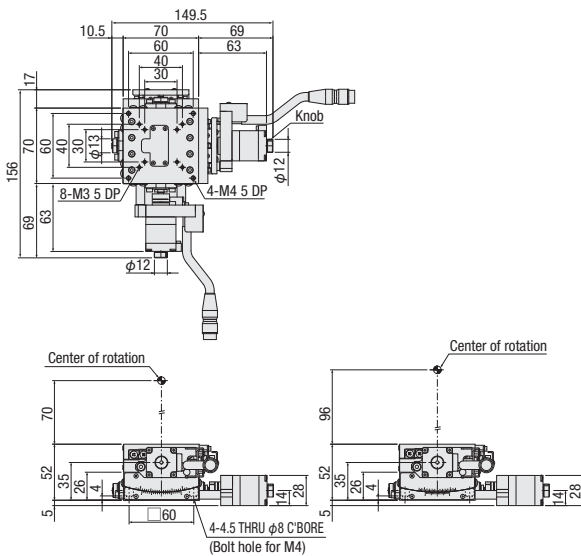
KGB07070AR

KGB07096AR

KGB07122AR

Dimensional outline drawings

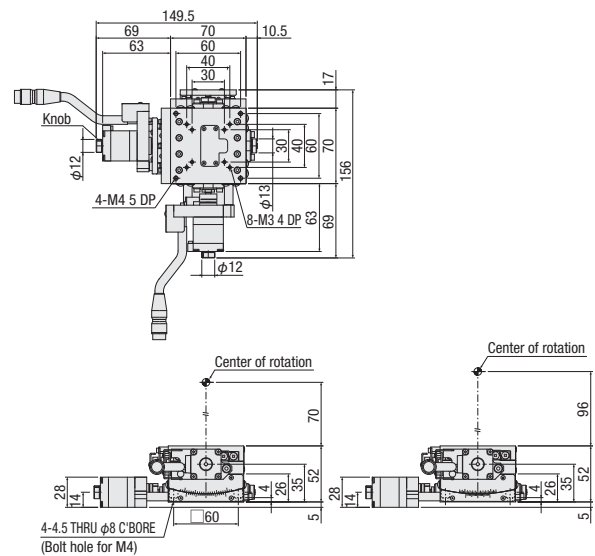
KAB07-L series



KAB07070AL

KAB07096AL

KAB07-R series



KAB07070AR

KAB07096AR

Motorized goniometer  
Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other



# Motorized Stage

## Electrical Specification • Option: KGB07/KAB07

Motorized goniometer Stage

X  
XY  
Z  
Horizontal Z  
XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

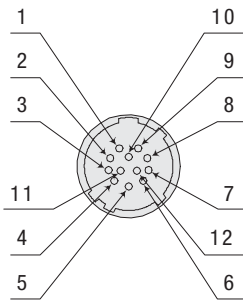
### Electrical specification

Model	KGB07070AL KGB07070AR	KGB07096AL KGB07096AR	KGB07122AL KGB07122AR
<b>Opposite hand</b>			
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)	
	Model (*2)	C005C-90215P	
	Step angle	0.72°	
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)	
	Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor (ORG1)	Installed	
	Slit origin sensor (ORG2)	Installed	
	Model	Photo microsensor: EE-SX398 (Omron Co.,Ltd.)、EE-SX498 (Omron Co.,Ltd.) : Limit・Origin sensor Photo microsensor: PM-F24 (Opposite hand PM-R24) (Panasonic Industrial Devices SUNX) : Slit origin sensor	
	Power voltage	DC5~24V ±10%	
	Consumption current	100mA or less	
	Control output	EE-SX398、EE-SX498: NPN open collector output DC5~24V 16mA or less Residual voltage 0.4V or less when the load current is 16mA PM-F24 (Opposite hand PM-R24) : NPN open collector output DC30V or less 50mA or less Residual voltage 0.4V or less when the load current is 16mA Residual voltage 0.7V or less when the load current is 50mA	
Output logic	EE-SX398: On detection (light shield condition): Output transistor ON (Continuity) EE-SX498: On detection (light shield condition): Output transistor OFF (Non-continuity) PM-F24 (R24) : On detection (light shield condition) : Output transistor ON (Continuity)		

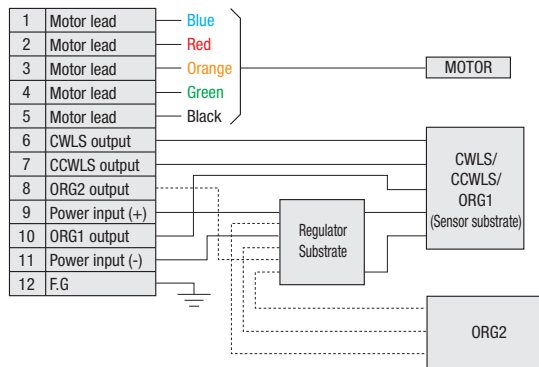
\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

### Pin allocation



### Connection diagram



### 70 goniometer sensor logic

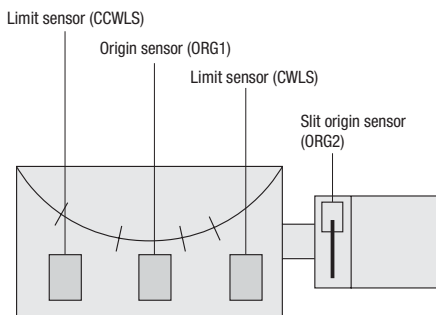
Type	CWLS	ORG1	CCWLS	ORG2
A	NC EE-SX498	NC EE-SX498	NC EE-SX498	NO PM-F24 (Opposite hand) PM-R24
B	NO EE-SX398	NO EE-SX398	NO EE-SX398	
C	NC EE-SX498	NO EE-SX398	NC EE-SX498	

\*Upper: Sensor logic  
Lower: Using sensor

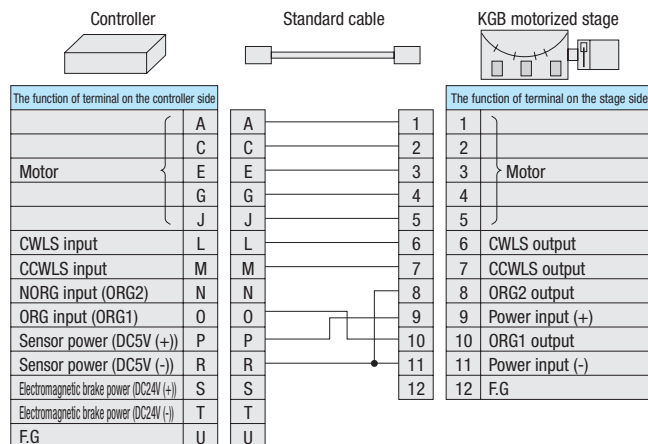
\*Broken line area does not work when use standard cable

### Built-in sensor

■ KGB series has built-in sensors such as below.



■ The connecting diagram that connected to our controller using standard attached cable is shown as below.



The CWLS (pin#6) and CCWLS (pin#7) on the motorized stage side are connected to CWLS (Lpin) and CCWLS (Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a result, return to origin should be done without the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

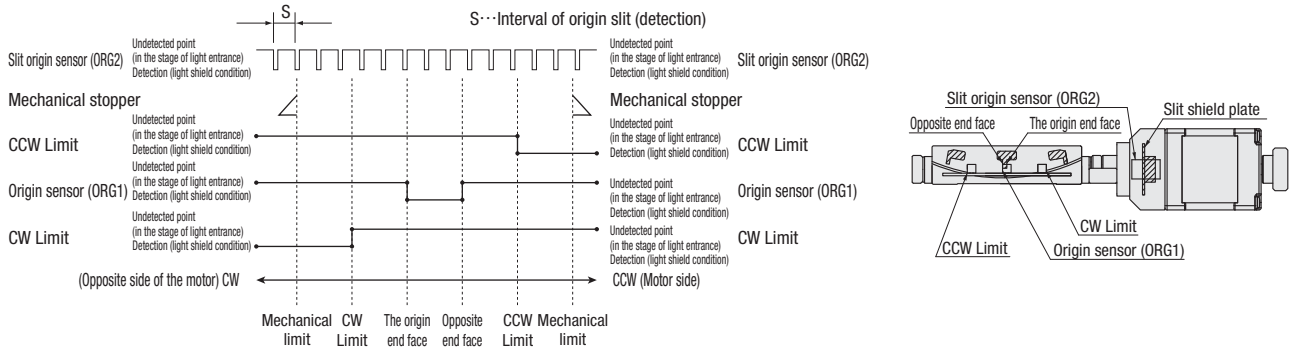
● Available the correspondence cable for a slit origin sensor (ORG2)! \*See page P.1-207 for details.

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors.

Also please note that the type is different from recommendation return to origin.

When use all of 4 sensors, please select the cable for 4 sensors from page P.1-207~.

**Timing chart**



Unit [deg]	Direction of CW ← → Direction of CCW					
	Detection clearance of slit origin S	Reference coordinate	CW Limit	Origin	Opposite end face	CCW Limit
<b>KGB07070A</b>	0.8	Return to origin	5.3	0	2.1	5.3
<b>KGB07096A</b>	0.6	Return to origin	4.2	0	1.5	4.2
<b>KGB07122A</b>	0.5	Return to origin	3.2	0	1.3	3.2

\* Return to origin means that is performed return to origin Type 4 using DS102/DS112 series. \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

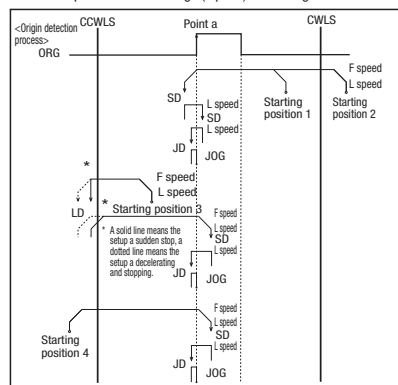
**KGB07/KAB07 recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

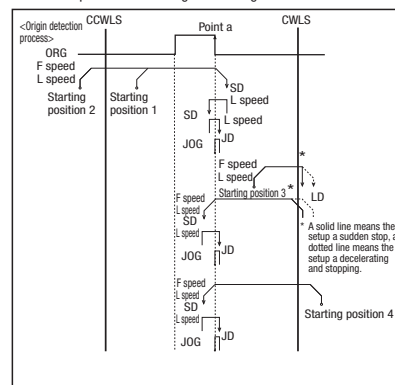
● Select return to origin type from the followings when use the slit origin sensor (ORG2).

- Type 1: Detect in the direction of CCW and perform detected process for CW edge (point a) of NORG signal. Next detect an edge of CCW side (point b) of ORG signal.
- Type 2: Detect in the direction of CW and perform detected process for CCW edge of NORG signal. Next detect on edge of CW side (point b) of ORG signal.
- Type 7: After finished type1, perform detected process for CCW edge of TIMING signal.
- Type 8: After finished type2, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball  
Screw

Worm  
Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

148

# Motorized Stage

## Goniometer Stage □40: KGW04/KAW04

■ 1-axis  
KGW04040 (KGW04 series)



■ 2-axis  
KAW04040 (KAW04 series)



RoHS

Can be used for KGW  
See page P.009

- Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.
- Configuration 2-axis  
Combination of 1-axis stage that is different center of rotation.

Model Selection code Option code  
**KGW04040-**

☞ Cable P.1-207~  
☞ Electrical specification P.1-151~

### 1 Axis

G	1-axis
A	2-axis

### 2 Table size

04	□40mm
----	-------

### 3 Height of center rotation (W.D)

040	40mm
060	60mm

\* 2-axis [A] is available for only 040.

### 4 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

### 5 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

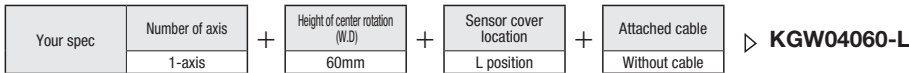
\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

### Selection Example



		SPEC		
Number of axis		1-axis		2-axis
Model		KGW04040-L	KGW04060-L	KAW04040-L
(Opposite hand)		KGW04040-R	KGW04060-R	KAW04040-R
Mechanical specification	Travel length Upper/Lower axis	±8°		±8°/±6°
	Table size	40×40mm		
	Travel mechanism	Worm gear (1/240)		
	Guide	Crossed roller guide		
Main materials-Finishing		Aluminum—Black almite finishing, Brass black coating		
Weight		0.4kg		0.8kg
Unusual items	Height of stage	20±0.2mm		40±0.4mm
	Height of center rotation	40±0.2mm	60±0.2mm	40±0.4mm
	Runout accuracy of center rotation	Within 0.01mm		
Accuracy specification	Resolution/Pulse	0.003° (Full)		
	MAX speed	15°/sec [5kHz]		
	Repeatability positioning accuracy	Within ±0.005°		
	Load capacity	3kgf [29.4N]		2.5kgf [24.5N]
	Moment stiffness	Pitch 1.30/yaw 1.16/roll 0.27 ["/N · cm]		Pitch 1.57/yaw 2.32/roll 1.57 ["/N · cm]
Sensor	Lost motion	Within 0.01°		
	Limit sensor	Installed		
	Origin sensor	Installed		
	Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)		4 of M3—6		

Motorized goniometer Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

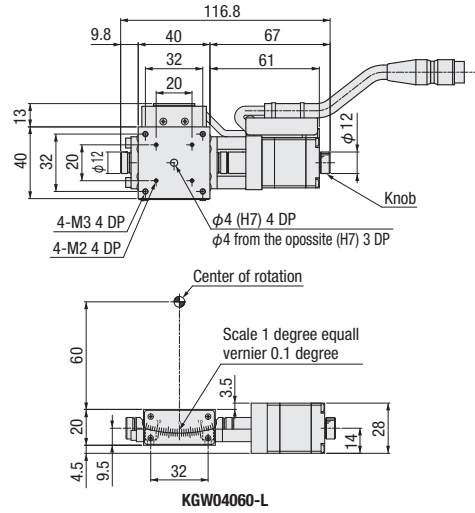
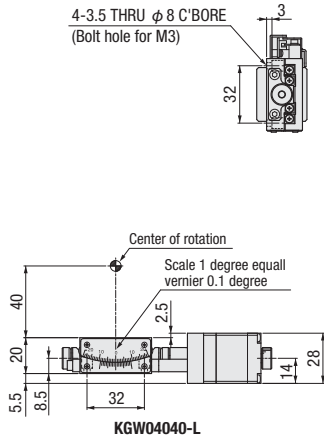
φ100

φ120

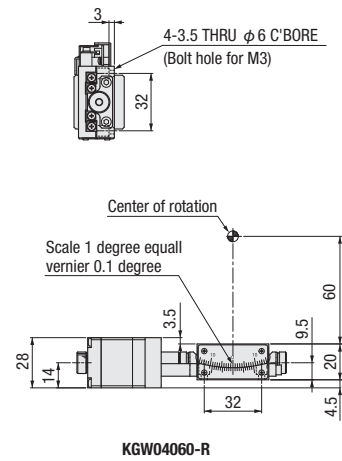
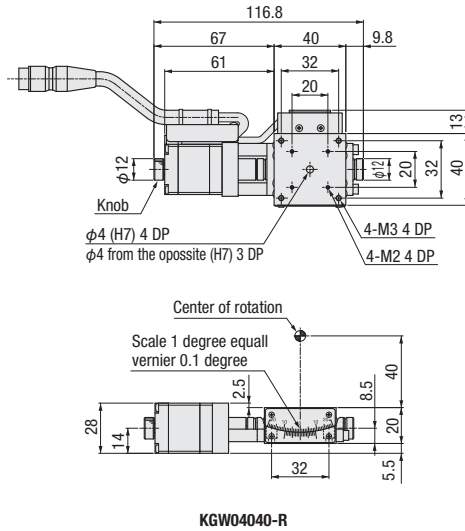
Other

**Dimensional outline drawings**

**KGW04-L series**

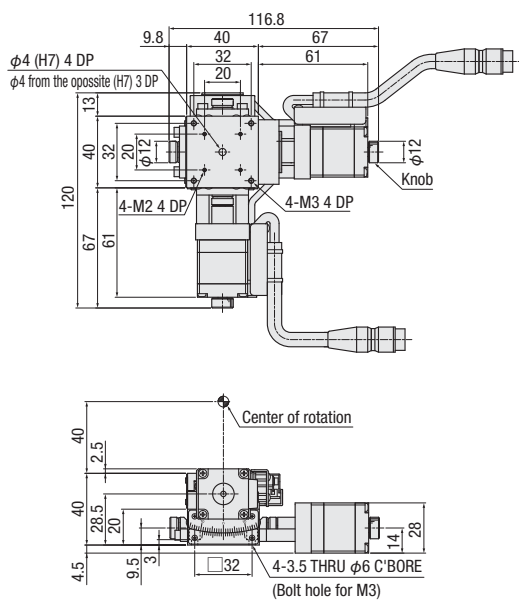


**KGW04-R series**

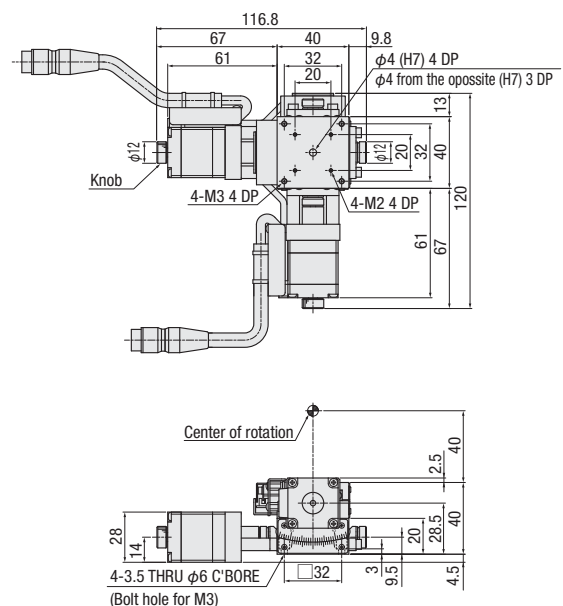


**Dimensional outline drawings**

**KAW04040-L**



**KAW04040-R**



Motorized goniometer  
Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

# Motorized Stage

## Electrical Specification: KGW04/KAW04

Motorized goniometer  
Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

### Electrical specification

Model		KGW04040-L	KGW04060-L
Opposite hand		KGW04040-R	KGW04060-R
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)	
	Model (*2)	C005C-90215P	
	Step angle	0.72°	
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd. )	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd. )	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Slit origin sensor	-	
	Model	Photo microsensor EE-SX4134 (Omron Co.,Ltd.)	
	Power voltage	DC5~24V ±10%	
	Consumption current	Total 60mA or less	
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA	
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)	

\*1 See page P. 1-213~ for details of single motor specification. \*2 Model is our own management model.

### Available sensor DC5V~24V.

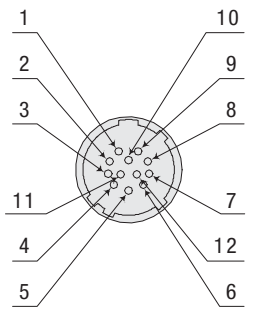
This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

It used to require the K-PCBA24 when the former products are driven by use of a motion control board or programable logic controller (PLC) without our controller.

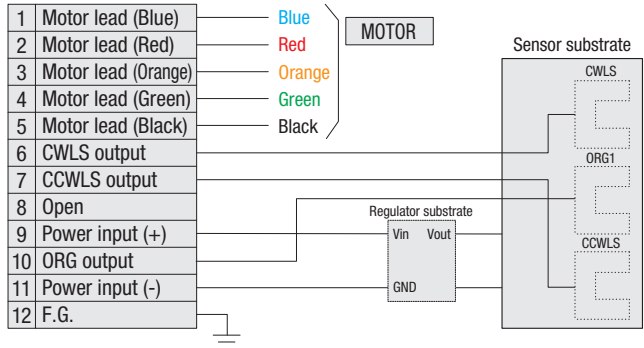
### Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS501-40, -60 and amplifier substrates will be replaced with KGW04 and 06 stages.  
We have avariety of harness that can be jumped between input and ou tput connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

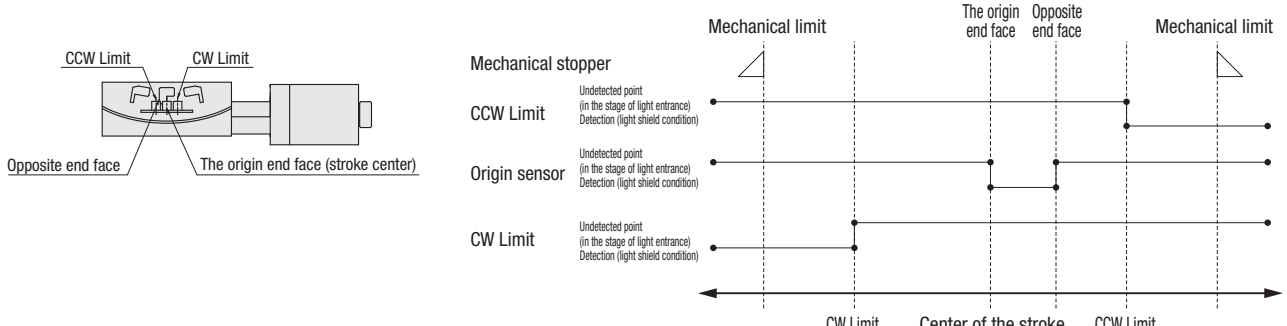
### Pin allocation



### Connection diagram



### Timing chart



Unit [deg.]	Reference coordinate	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit
KGW04040	Return to origin	8.5	0	2.5	8.5
KGW04060	Return to origin	6.5	0	2.1	6.5

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.  
\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Note: The timing chart shows on ly timing of sensor, it is not for output signal logic.  
Refer to ON/OF F display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

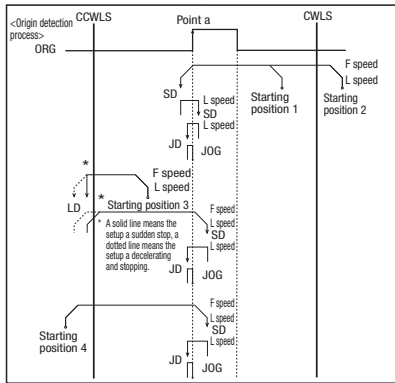
**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly.  
 Set to the way of recommendation return origin when using our controller.

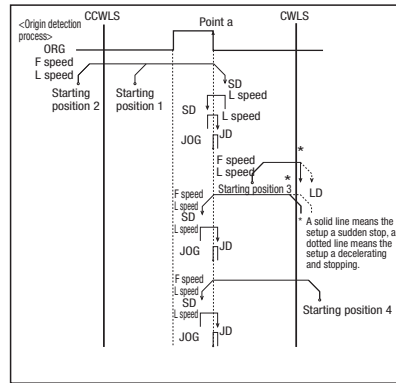
**■ KGW04/KAW04 recommended return to origin Return to origin sequence ▶P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**■ Driver ▶P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

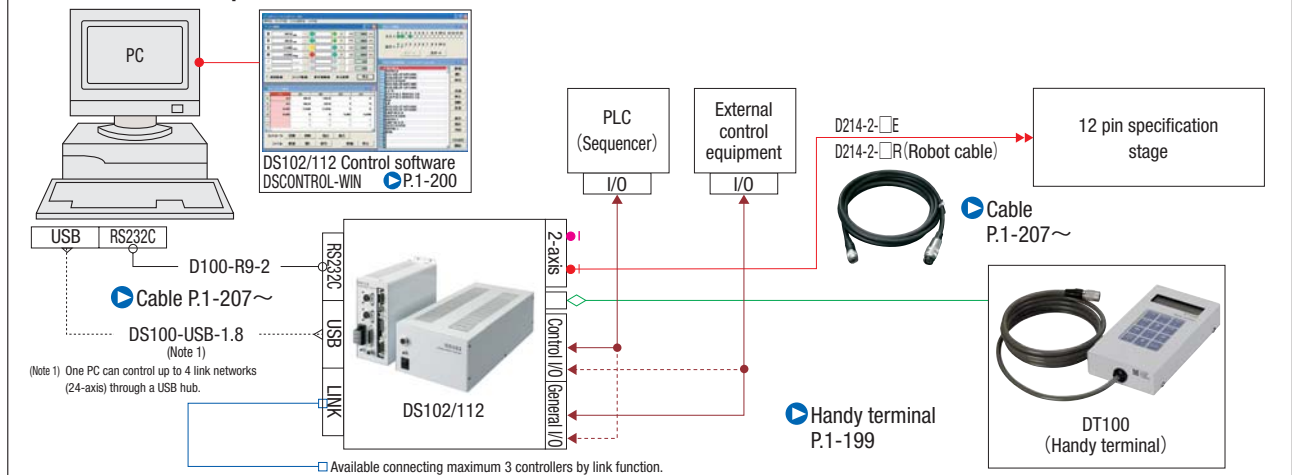
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**■ Controller ▶P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**■ Connection example**



Ball Screw

Worm Gear

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

## Goniometer Stage □50: KG05/KA05

■1-axis  
KG05-W050A (KG05-W series)



■2-axis  
KA05-W068A (KA05-W series)



RoHS

■Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.

■Configuration 2-axis  
Combination of 1-axis stage that is different center of rotation.

Model Selection code Option code  
**K** **G05-W050A** **□** **-5**

🔗 Cable P.1-207~  
 🔗 Electrical specification P.1-155~

### 1 Axis

G	1-axis
A	2-axis

### 2 Height of center rotation (W.D)

050	50mm
068	68mm
086	86mm

\*2 Unselectable 086 for 2-axis

### 3 Sensor cover location specification

Code	Specification
Blank	L position
R	Opposite hand

### 4 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

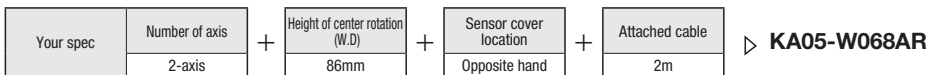
\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

### Selection Example



		SPEC					
		1-axis			2-axis		
<b>Number of axis</b>							
<b>Model</b>		KG05-W050A-5	KG05-W068A-5	KG05-W086A-5	KA05-W050A-5	KA05-W068A-5	
<b>(Opposite hand)</b>		KG05-W050AR-5	KG05-W068AR-5	KG05-W086AR-5	KA05-W050AR-5	KA05-W068AR-5	
Mechanical specification	Travel length Upper/Lower axis	±10°	±8°	±6°	±10°/±8°	±8°/±6°	
	Table size	50×50mm					
Travel mechanism (Reduction ratio)	Upper	Worm gear (1/231)	Worm gear (1/300)	Worm gear (1/375)	Worm gear (1/231)	Worm gear (1/300)	
	Lower				Worm gear (1/300)	Worm gear (1/375)	
Guide		Crossed roller guide					
Main materials-Finishing		Aluminum—White almite finish、Brass—Nickel chrome plating					
Weight		0.75kg			1.5kg		
Dimensional tolerance	Height of stage	18±0.2mm			36±0.4mm		
	Height of center rotation	50±0.2mm	68±0.2mm	86±0.2mm	50±0.4mm	68±0.4mm	
	Runout accuracy of center rotation	Within 0.01mm					
Accuracy specification	Resolution/Pulse	Upper at the full	0.001559°	0.0012°	0.00096°	0.001559°	
		Lower at the full				0.0012°	0.00096°
	MAX speed	Upper	7.8°/sec [5kHz]	6°/sec [5kHz]	4.8°/sec [5kHz]	7.8°/sec [5kHz]	6°/sec [5kHz]
		Lower				6°/sec [5kHz]	4.8°/sec [5kHz]
Repeatability positioning accuracy		Within ±0.005°					
Load capacity		3kgf [29.4N]			2.3kgf [22.5N]		
Moment stiffness		Pitch 0.42°/yaw 0.16°/roll 0.23 ["/N · cm]			Pitch 0.65°/yaw 0.32°/roll 0.65 ["/N · cm]		
Lost motion		Within 0.01°					
Sensor	Limit sensor	Installed					
	Origin sensor	Installed					
	Slit origin sensor	Installed					
	Provided screw (Hexagon-headed bolt)	4 of M3-6					

Motorized goniometer Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

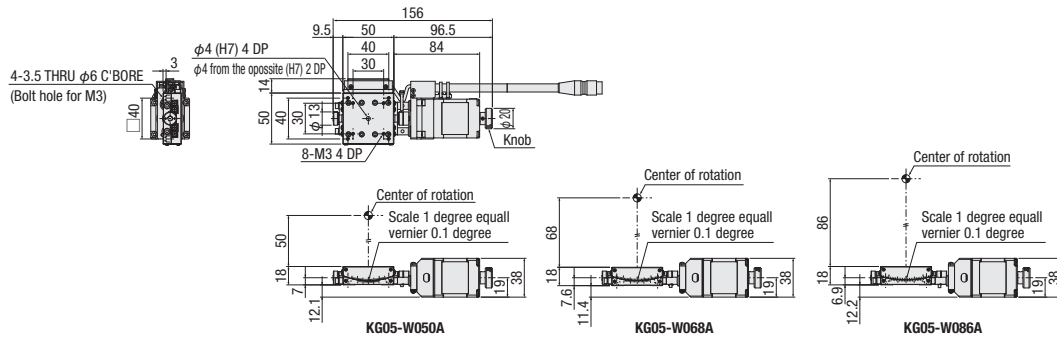
φ100

φ120

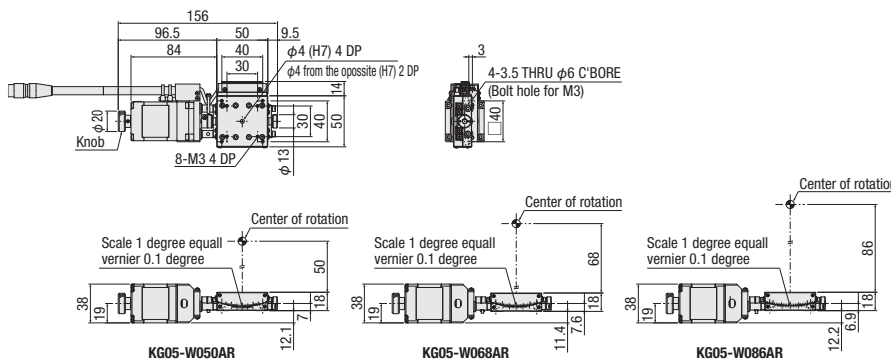
Other

**Dimensional outline drawings (1-axis)**

**KG05-W series**

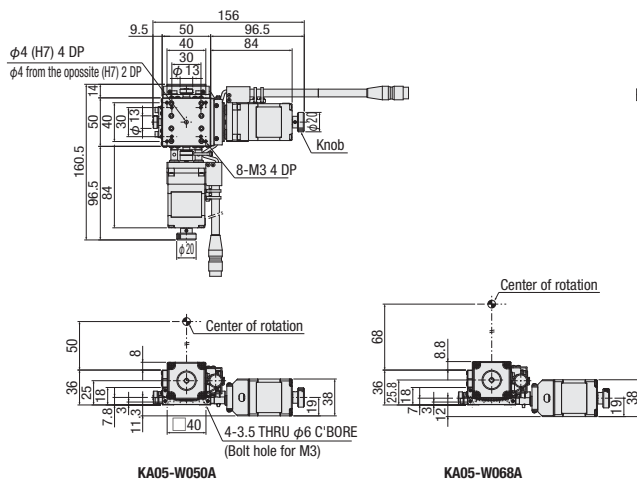


**KG05-WR series**

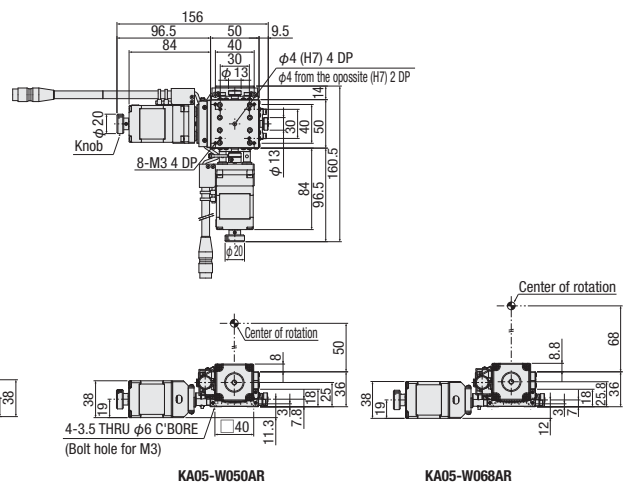


**Dimensional outline drawings (2-axis)**

**KA05-W series**



**KA05-WR series**





# Motorized Stage

## Electrical Specification: KG05/KA05

Motorized goniometer stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

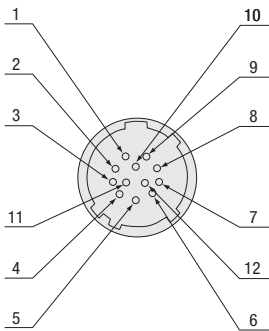
Other

### Electrical specification

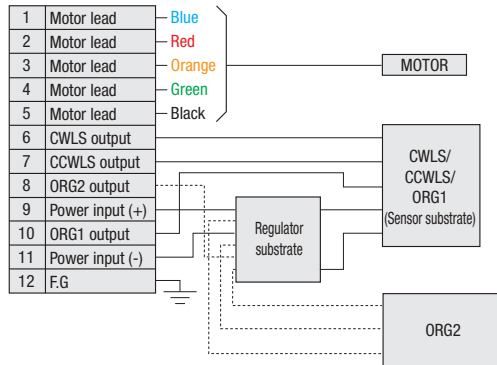
Model		KG05-W050A	KG05-W068A	KG05-W086A
Opposite hand		KG05-W050AR	KG05-W068AR	KG05-W086AR
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)		
	Model (*2)	C9582-9015-1		
	Step angle	0.36°		
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		
	Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		
Sensor	Limit sensor	Installed		
	Origin sensor (ORG1)	Installed		
	Slit origin sensor (ORG2)	Installed		
	Model	Photo microsensor: EE-SX4134 (Omuron Co.,Ltd.) : Limit · Origin sensor (ORG1) Photo microsensor: PM-L24 (Panasonic Industrial Devices SUNX) : Slit origin sensor (ORG2)		
	Power voltage	DC5~24V ±10%		
	Consumption current	100mA or less		
	Control output	EE-SX4134: NPN open collector output DC5~24V 8mA or less Residual voltage 0.4V or less when the load current is 8mA PM-L24: NPN open collector output DC30V or less 50mA or less Residual voltage 0.4V or less when the load current is 16mA Residual voltage 0.7V or less when the load current is 50mA		
Output logic	EE-SX4134: On detection (light shield condition): Output transistor OFF (Non-continuity) PM-L24: On detection (light shield condition) : Output transistor ON (Continuity)			

\*1 See page P.1-213~ for details of single motor specification.  
\*2 Model is our own management model.

### Pin allocation



### Connection diagram



### 50 goniometer sensor logic

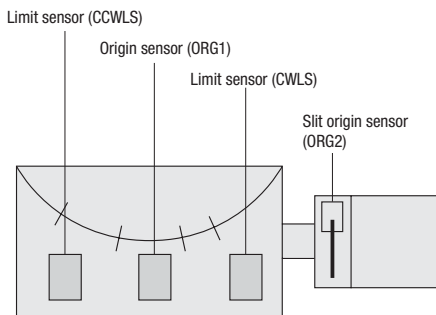
Type	CWLS	ORG1	CCWLS	ORG2
A	NC EE-SX4134	NC EE-SX4134	NC EE-SX4134	NO PM-L24

\* Upper: Sensor logic  
Lower: Using sensor  
Note: Only 50 goniometer stage sensor logic

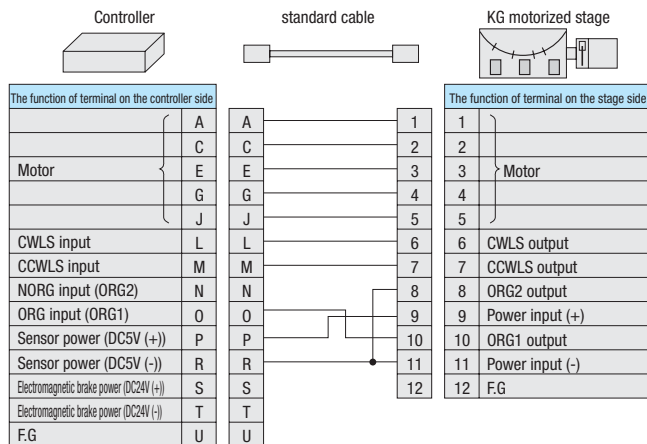
\* Broken line area does not work when use standard cable.  
It works with slit origin sensor cable.

### Built-in sensor

KG series has built-in sensors such as below.



The connecting diagram that connected to our controller using standard attached cable is shown as below.

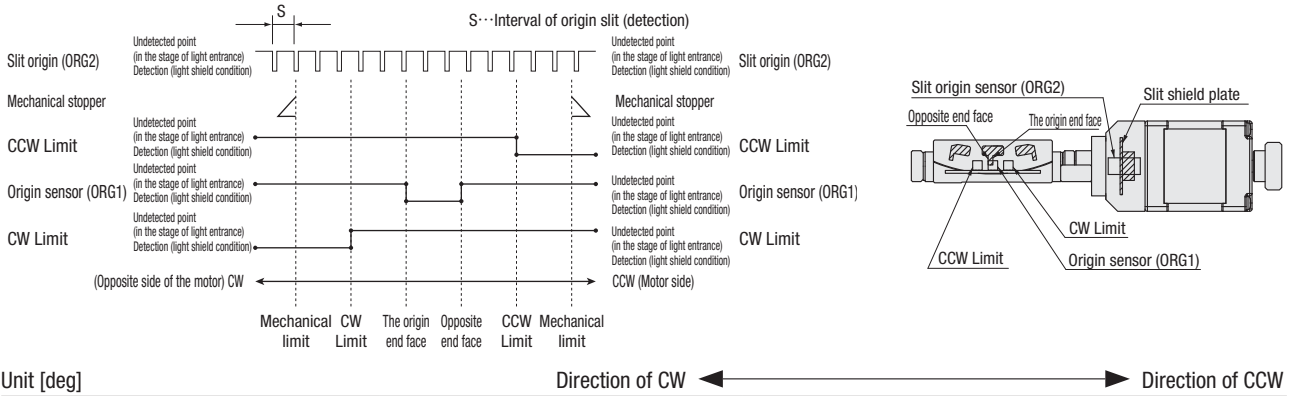


The CWLS (pin#6) and CCWLS (pin#7) on the motorized stage side are connected to CWLS (Lpin) and CCWLS (Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a result, return to origin should be done without the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

Available the correspondence cable for a slit origin sensor (ORG2)! See page P.1-207 for details.

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors. Also please note that the type is different from recommendation return to origin.  
When use all of 4 sensors, please select the cable for 4 sensors from page P.1-207~.

**Timing chart**



Unit [deg]	Detection clearance of slit origin S	Reference coordinate	CW Limit	Origin	Opposite end face	CCW Limit
<b>KG05-W050A</b>	1.6	Return to origin	10.3	0	1.9	10.3
<b>KG05-W068A</b>	1.2	Return to origin	8.3	0	1.5	8.3
<b>KG05-W086A</b>	1.0	Return to origin	6.3	0	1.2	6.3

\* Return to origin means that is performed return to origin Type 4 using DS102/DS112 series.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

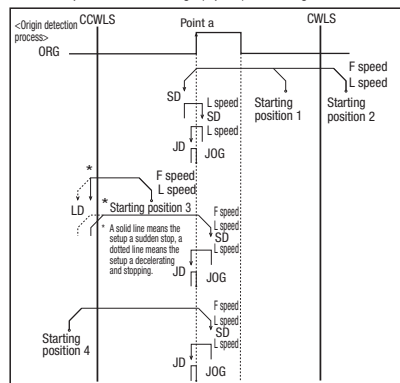
**KG05/KA05 recommended return to origin Return to origin sequence** ▶ P.1-201~

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

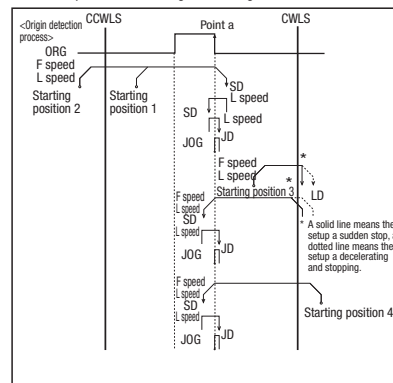
● Available the correspondence cable for a slit origin sensor (ORG2)! \* Select return origin method as below

- Type 1: Detect in the direction of CCW and perform detected process for CW edge (point a) of NORG signal. Next detect an edge of CCW side (point b) of ORG signal.
- Type 2: Detect in the direction of CW and perform detected process for CCW edge of NORG signal. Next detect on edge of CW side (point b) of ORG signal.
- Type 7: After finished type1, perform detected process for CCW edge of TIMING signal.
- Type 8: After finished type2, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver** ▶ P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller** ▶ P.1-197~

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Ball Screw
- Worm Gear

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

# Motorized Stage

## Goniometer Stage □60: KGW06 (1-axis)

1-axis  
KGW06050 (KGW06 series)



Freely customize the motor

RoHS

See page P.009

Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.

Model Selection code Option code  
**KGW06050-**

1 2 3 4

Cable P.1-207~  
Electrical specification P.1-161~

### 1 Table size

06	□60mm
----	-------

### 2 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm
125	125mm

### 3 Sensor cover location specification

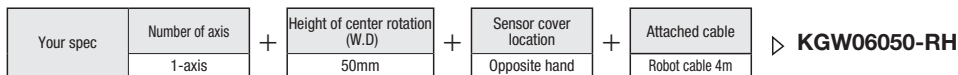
Code	Specification
L	L position
R	Opposite hand

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207, 209~ for details of cable.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

### Selection Example



### SPEC

		1-axis			
Number of axis		1-axis			
Model		KGW06050-L	KGW06075-L	KGW06100-L	KGW06125-L
(Opposite hand)		KGW06050-R	KGW06075-R	KGW06100-R	KGW06125-R
Mechanical specification	Travel length	±10°	±8°	±6°	±5°
	Table size	60×60mm			
	Travel mechanism (Reduction ratio)	Worm gear (1/160)	Worm gear (1/225)	Worm gear (1/292)	Worm gear (1/360)
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum—Black almite finishing			
	Weight	0.5kg			
Dimensional specification	Height of stage	25±0.2mm			
	Height of center rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm
	Runout accuracy of center rotation	Within 0.01mm			
Accuracy specification	Resolution/Pulse	0.0045° (Full)	0.0032° (Full)	0.002466° (Full)	0.002° (Full)
	MAX speed	22.5°/sec [5kHz]	16°/sec [5kHz]	12.5°/sec [5kHz]	10°/sec [5kHz]
	Repeatability positioning accuracy	Within ±0.003°			
	Load capacity	5kgf [49N]			
	Moment stiffness	Pitch 0.30/yaw 0.10/roll 0.11 ["/N · cm]			
	Lost motion	Within 0.01°			
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	—			
Other	Provided screw (Hexagon-headed bolt)	4 of M4—10			

Motorized goniometer

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

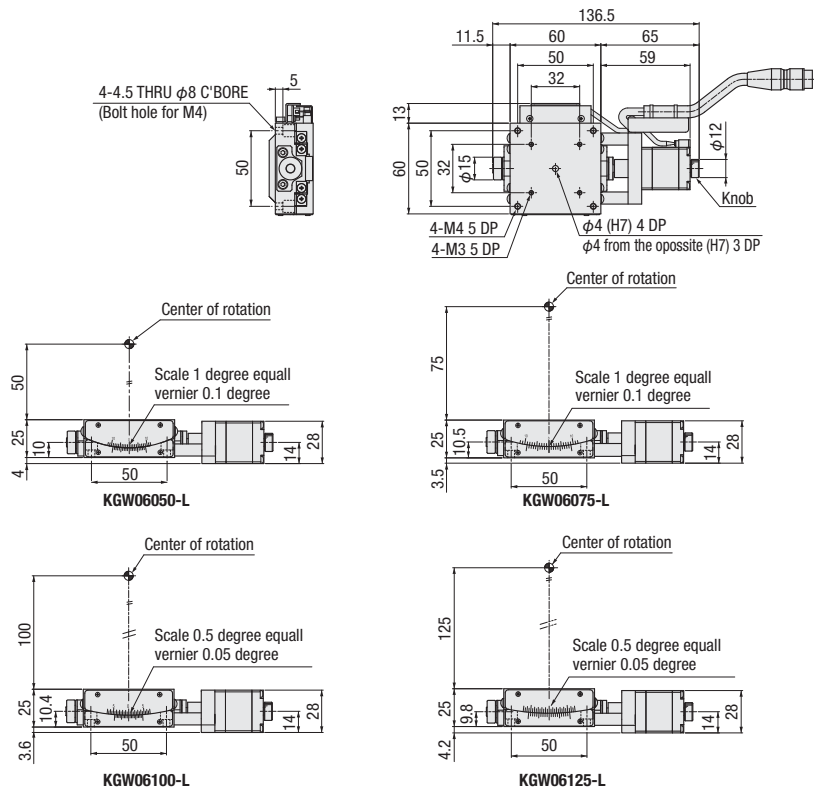
Ball Screw

Worm Gear

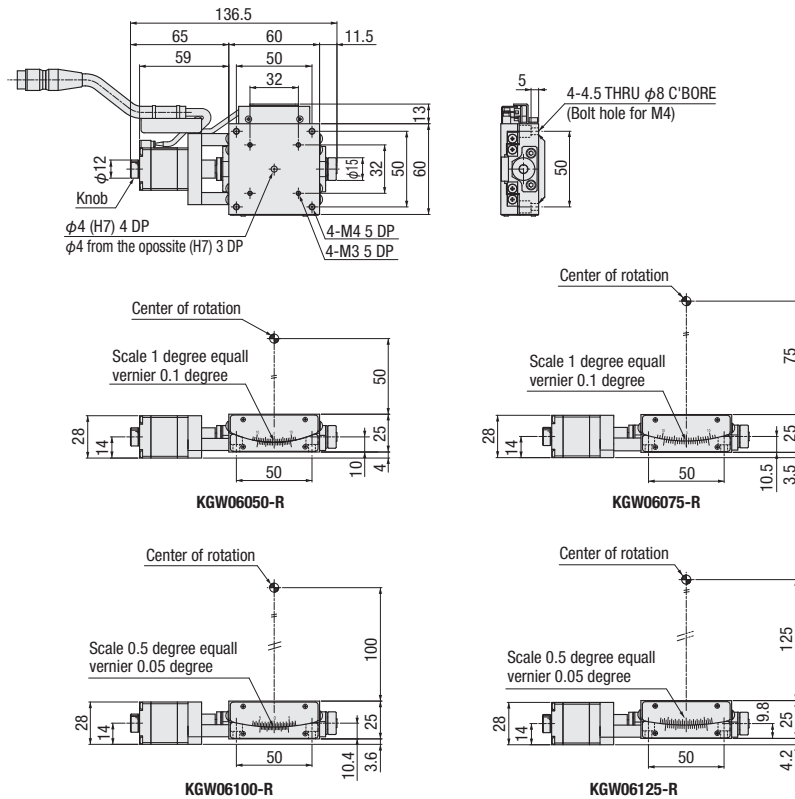
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

Dimensional outline drawings (1-axis)

KGW06-L series



KGW06-R series (Opposite hand)



## Goniometer Stage □60: KAW06 (2-axis)

2-axis  
KAW06075 (KAW06 series)



RoHS

- Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.
- Configuration 2-axis Combination of 1-axis stage that is different center of rotation.

Model Selection code Option code  
**KAW06050-** □ □  
1 2 3 4

☉ Cable P.1-207~  
☉ Electrical specification P.1-161~

### 1 Table size

06	□60mm
----	-------

### 2 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm

### 3 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* One end loose position to only stage opposite side.  
\* If you choose the option specification, please add the difference to standard price.  
\* See page P.1-207, 209~ for details of cable.  
\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

### Selection Example



### SPEC

Number of axis		2-axis			
Model		KAW06050-L	KAW06075-L	KAW06100-L	
(Opposite hand)		KAW06050-R	KAW06075-R	KAW06100-R	
Mechanical specification	Travel length Upper/Lower axis	±10°/±8°		±6°/±5°	
	Table size	60×60mm			
	Travel mechanism (Reduction ratio)	Upper	Worm gear (1/160)	Worm gear (1/225)	Worm gear (1/292)
		Lower	Worm gear (1/225)	Worm gear (1/292)	Worm gear (1/360)
Guide	Crossed roller guide				
Main materials-Finishing	Aluminum—Black almite finishing				
Weight	1.0kg				
Dimensional tolerance	Height of stage	50±0.4mm			
	Height of center rotation	50±0.4mm	75±0.4mm	100±0.4mm	
	Runout accuracy of center rotation	—			
Accuracy specification	Resolution/Pulse	Upper at the full	0.0045°	0.0032°	0.002466°
		Lower at the full	0.0032°	0.002466°	0.002°
	MAX speed	Upper	22.5°/sec [5kHz]	16°/sec [5kHz]	12.5°/sec [5kHz]
		Lower	16°/sec [5kHz]	12.5°/sec [5kHz]	10°/sec [5kHz]
	Repeatability positioning accuracy	Within ±0.005°			
Load capacity	4.5kgf [44.1N]				
Moment stiffness	Pitch 0.41/yaw 0.2/roll 0.41 ["/N · cm]				
Lost motion	Within 0.01°				
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	—			
Provided screw (Hexagon-headed bolt)	4 of M4—10				

Motorized goniometer Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

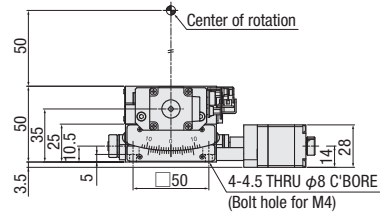
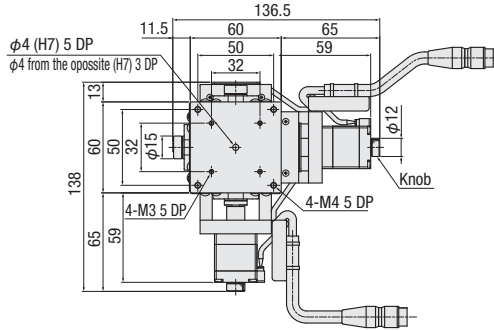
Ball Screw

Worm Gear

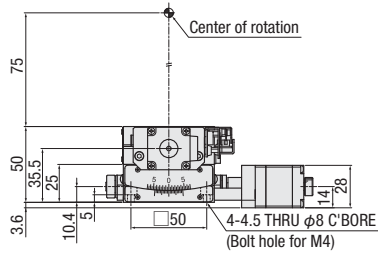
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

Dimensional outline drawings (2-axis)

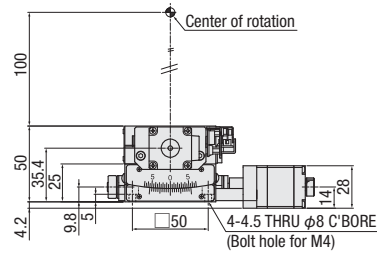
KAW06-L series



KAW06050-L

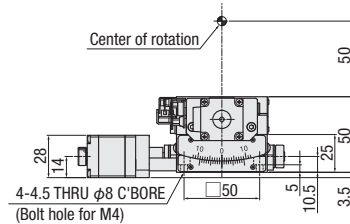
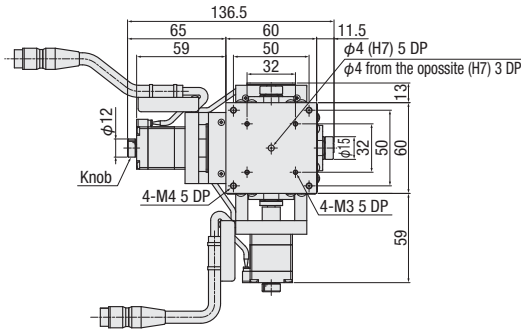


KAW06075-L

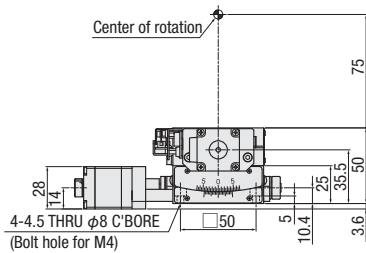


KAW06100-L

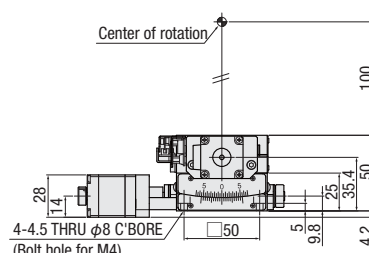
KAW06-R series(Opposite hand)



KAW06050-R



KAW06075-R



KAW06100-R

# Motorized Stage

## Electrical Specification: KGW06/KAW06

Motorized goniometer stage

### Electrical specification

Model	KGW06050-L	KGW06075-L	KGW06100-L	KGW06125-L
Opposite hand	KGW06050-R	KGW06075-R	KGW06100-R	KGW06125-R
Motor (*1)	Type			
	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)			
	Model (*2)			
C005C-90215P				
Step angle				0.72°
Connector	Model			
	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)			
	applicable connector on acceptance side HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)			
Sensor	Limit sensor			
	Installed			
	Origin sensor			
	Installed			
	Slit origin sensor			
	—			
	Model			
	Photo microsensor EE-SX4134 (Omuron Co.,Ltd.)			
Power voltage				DC5~24V ±10%
Consumption current				Total 60mA or less
Control output				NPN open collector output DC5~24V 8mA or less
Residual voltage 0.3V or less when the load current is 2mA				
Output logic				On detection (light shield condition): Output transistor OFF (Non-continuity)

\*1 See page P.1-213~ for details of single motor specification.  
 \*2 Model is our own management model.

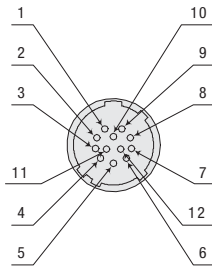
### Available sensor DC5V~24V.

This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.  
 It used to require the K-PCBA24 when the former products are driven by use of a motion control board or programmable logic controller (PLC) without our controller.

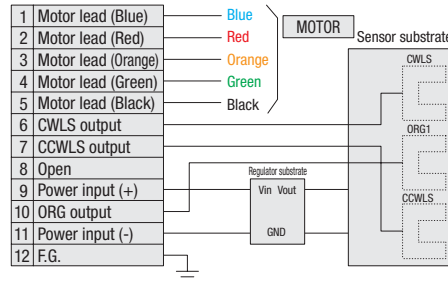
### Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS501-40, -60 and amplifier substrates will be replaced with KGW04 and 06 stages.  
 We have a variety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

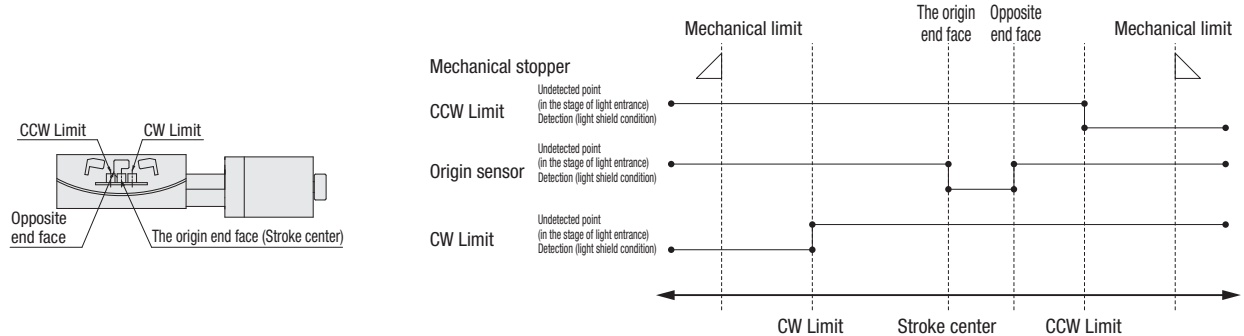
### Pin allocation



### Connection diagram



### Timing chart



Unit [deg.]	Direction of CW ←	Direction of CCW →			
Reference coordinate	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit	
KGW06050	Return to origin	10.5	0	2.5	10.5
KGW06075	Return to origin	8.3	0	1.8	8.3
KGW06100	Return to origin	6.3	0	1.4	6.3
KGW06125	Return to origin	5.2	0	1.1	5.2

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.  
 \* The coordinate is a basis of design value. Dimension error may occur about plus or minus 0.5 deg.  
 Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
 Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball  
Screw

Worm  
Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

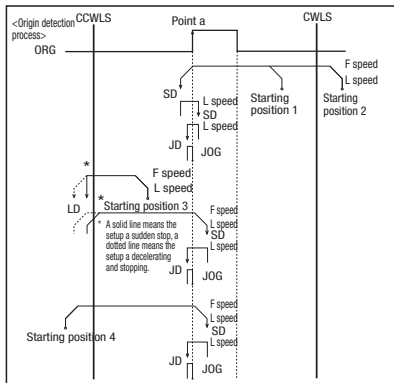
**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

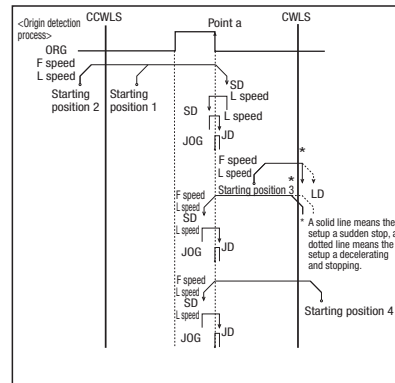
**■ KGW06/KAW06 recommended return to origin Return to origin sequence ▶ P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type10: After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**■ Driver ▶ P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

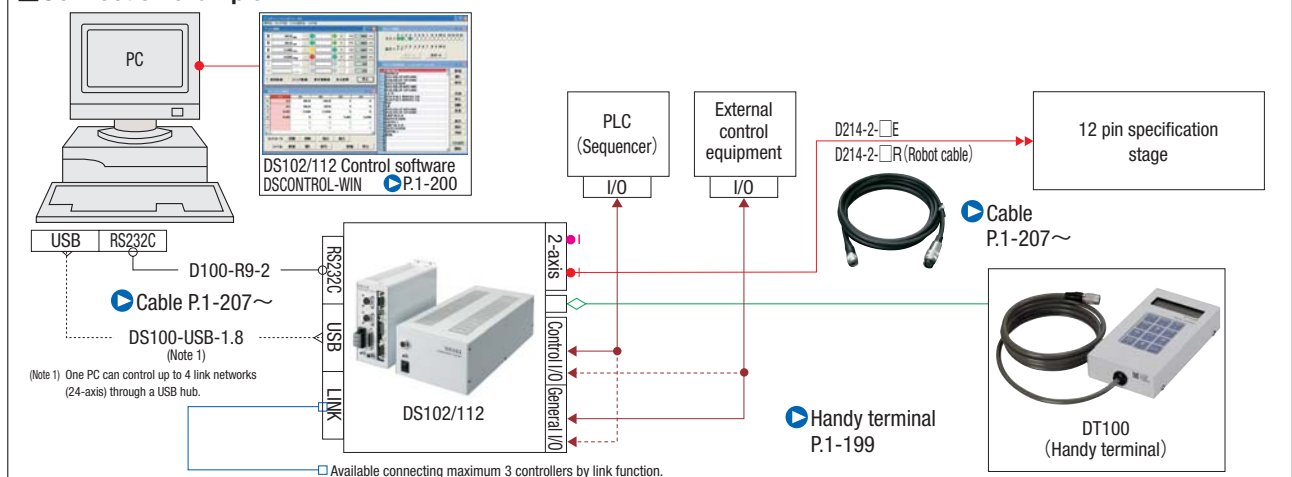
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**■ Controller ▶ P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**■ Connection example**



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Ball Screw

- Worm Gear

- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other



# Motorized Stage

## Goniometer Stage □70: KG07/KA07

1-axis  
KG07-W070A (KG07-W series)



2-axis  
KA07-W070A (KA07-W series)



RoHS

- Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.
- 70°70mm has an additional sensor logic system.
- Configuration 2-axis
- Combination of 1-axis stage that is different center of rotation.

Model Selection code Option code

**K** **G07-W070**   **-5**

1 2 3 4 5

☉ Cable P.1-207~  
☉ Electrical specification P.1-161~

### 1 Axis

G	1-axis
A	2-axis

### 2 Height of center rotation (W.D)

070	70mm
096	96mm
122	122mm

\* KA07 is only W.D70 and 90mm

### 3 Sensor logic

Type	CWLS	ORG1	CCWLS	ORG2
A	NC	NC	NC	NO
B	NO	NO	NO	
C	NC	NO	NC	

### 4 Sensor cover location specification

Code	Specification
Blank	L position
R	Opposite hand

### 5 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

### Selection Example

Your spec

Number of axis	2-axis
----------------	--------

+

Height of center rotation (W.D)	96mm
---------------------------------	------

+

Sensor cover location	Opposite hand
-----------------------	---------------

+

Sensor logic	Absolutely NO
--------------	---------------

+

Attached cable	2m
----------------	----

▷ **KA07-W096BR**

		SPEC				
Number of axis		1-axis		2-axis		
Model		KG07-W070A-5	KG07-W096A-5	KG07-W122A-5	KA07-W070A-5	KA07-W096A-5
(Opposite hand)		KG07-W070AR-5	KG07-W096AR-5	KG07-W122AR-5	KA07-W070AR-5	KA07-W096AR-5
Mechanical specification	Travel length Upper/Lower axis	±9°	±7°	±5°	±9°/±7°	±7°/±5°
	Table size	70×70mm				
Mechanical specification	Travel mechanism (Reduction ratio) Upper Lower	Worm gear (1/235)	Worm gear (1/301)	Worm gear (1/375)	Worm gear (1/235)	Worm gear (1/301)
	Guide	Crossed roller guide				
Main materials-Finishing		Aluminum—White almite finish				
Weight		1.0kg		2.0kg		
Dimensional tolerance	Height of stage	26±0.2mm		52±0.4mm		
	Height of center rotation	70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm
Runout accuracy of center rotation		Within 0.01mm				
Accuracy specification	Resolution (Pulse) Upper at the full Lower at the full	0.001532°	0.001196°	0.00096°	0.001532°	0.001196°
	MAX speed Upper Lower	7.6°/sec [5kHz]	6°/sec [5kHz]	4.8°/sec [5kHz]	7.6°/sec [5kHz]	6°/sec [5kHz]
Repeatability positioning accuracy		Within ±0.003°				
Load capacity		5kgf [49N]		4kgf [39.2N]		
Moment stiffness		Pitch 0.17°/yaw 0.06°/roll 0.06 ["/N · cm]		Pitch 0.23°/yaw 0.12°/roll 0.23 ["/N · cm]		
Lost motion		Within 0.006°				
Sensor	Limit sensor	Installed				
	Origin sensor	Installed				
	Slit origin sensor	Installed				
Provided screw (Hexagon-headed bolt)		4 of M4—8				

Motorized goniometer

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

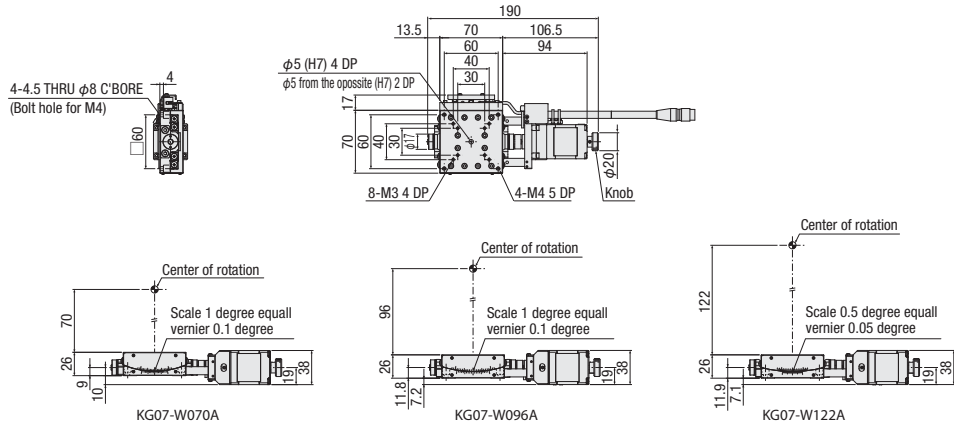
- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

- Ball Screw
- Worm Gear

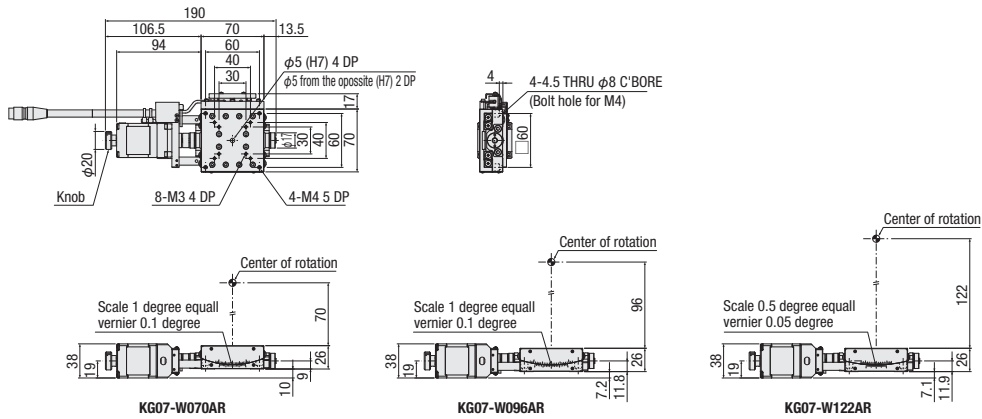
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

**Dimensional outline drawings (1-axis)**

**KG07-W series**



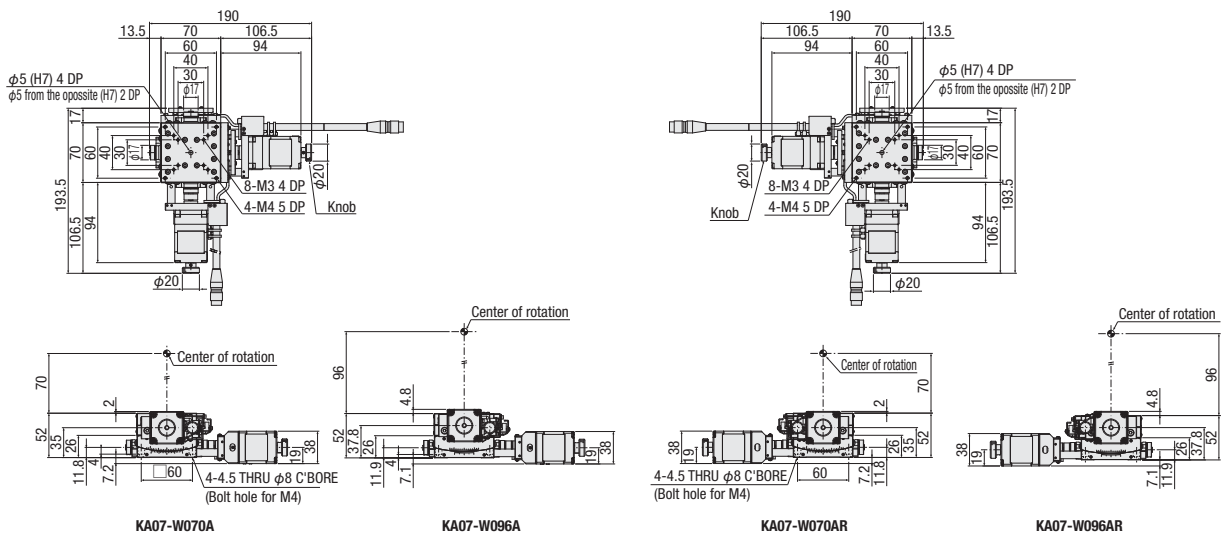
**KG07-WR series**



**Dimensional outline drawings (2-axis)**

**KA07-W series**

**KA07-WR series**



# Motorized Stage

## Electrical Specification: KG07/KA07

Motorized goniometer

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

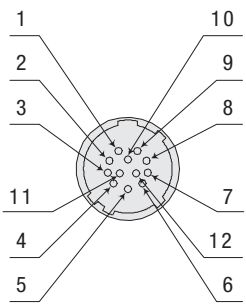
Other

### Electrical specification

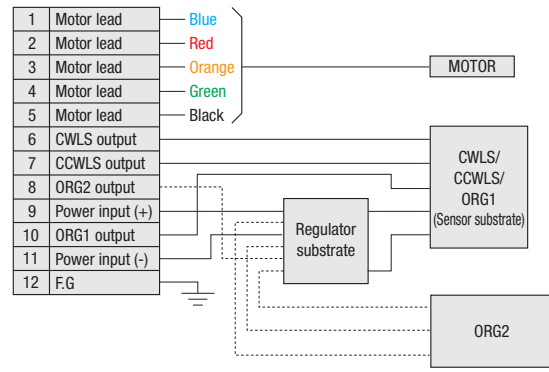
Model		KG07-W070A	KG07-W096A	KG07-122A
Opposite hand		KG07-W070AR	KG07-W096AR	KG07-122AR
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)		
	Model (*2)	C9582-9015-1		
	Step angle	0.36°		
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		
Sensor	Limit sensor	Installed		
	Origin sensor (ORG1)	Installed		
	Slit origin sensor (ORG2)	Installed		
	Model	Photo microsensor: EE-SX398 (Omuron Co.,Ltd.)、EE-SX498 (Omuron Co.,Ltd.) : Limit・Origin sensor (ORG1) Photo microsensor: PM-L24 (Panasonic Industrial Devices SUNX) : Slit origin sensor (ORG2)		
	Power voltage	DC5~24V ±10%		
	Consumption current	100mA or less		
	Control output	EE-SX398、EE-SX498: NPN open collector output DC5V~24V 16mA or less Residual voltage 0.4V or less when the load current is 16mA PM-L24: NPN open collector output DC30V or less 50mA or less Residual voltage 0.4V or less when the load current is 16mA Residual voltage 0.7V or less when the load current is 50mA		
	Output logic	EE-SX398: On detection (light shield condition): Output transistor ON (Continuity) EE-SX498: On detection (light shield condition): Output transistor OFF (Non-continuity) PM-L24: On detection (light shield condition) : Output transistor ON (Continuity)		

\*1 See page P.1-213~ for details of single motor specification. \*2 Model is our own management model.

### Pin allocation



### Connection diagram



\* Broken line area does not work when use standard cable  
It works with slit origin sensor cable

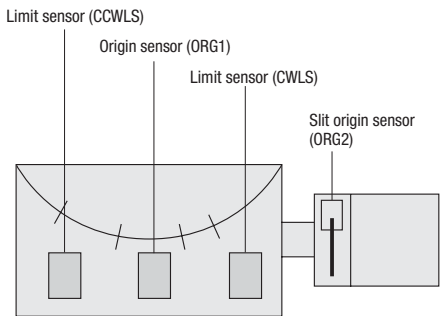
### 70 goniometer sensor logic

Type	CWLS	ORG1	CCWLS	ORG2
A	NC EE-SX498	NC EE-SX498	NC EE-SX498	NO PM-L24
B	NO EE-SX398	NO EE-SX398	NO EE-SX398	
C	NC EE-SX498	NO EE-SX398	NC EE-SX498	

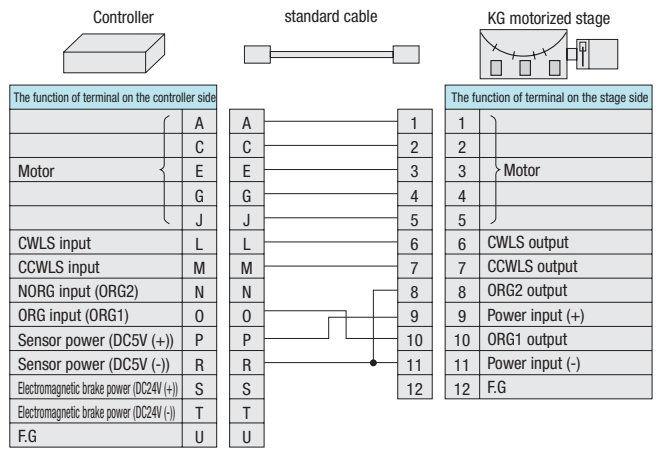
\* Upper: Sensor logic  
Lower: Using sensor

### Built-in sensor

KG series have built-in sensors as below.



The connecting diagram that connected to our controller using standard attached cable is shown as below.



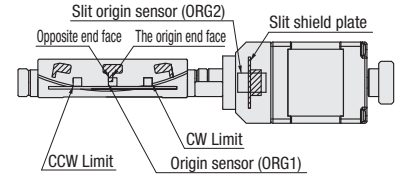
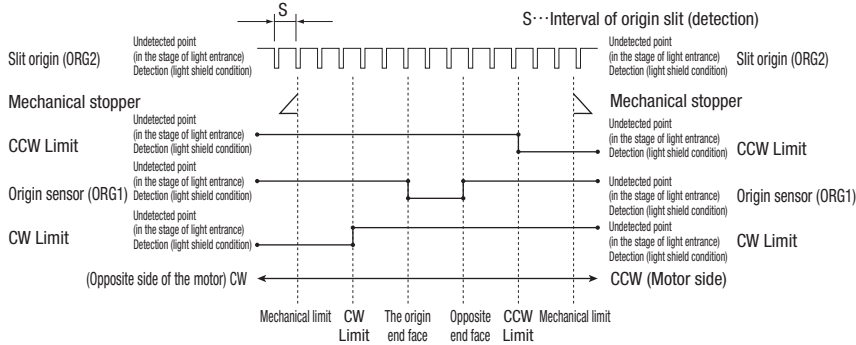
The CWLS (pin#6) and CCWLS (pin#7) on the motorized stage side are connected to CWLS (Lpin) and CCWLS (Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a result, return to origin should be done without the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

Available the correspondence cable for a slit origin sensor (ORG2)! See page P.1-207 for details.

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors. Also please note that the type is different from recommendation return to origin.

When use all of 4 sensors, please select the cable for 4 sensors from P.1-207~.

**Timing chart**



Unit [deg]	Direction of CW ←			→ Direction of CCW		
	Detection clearance of slit origin S	Reference coordinate	CW Limit	Origin	Opposite end face	CCW Limit
<b>KG07-W070A</b>	1.5	Return to origin	9.3	0	2.1	9.3
<b>KG07-W096A</b>	1.2	Return to origin	7.3	0	1.6	7.3
<b>KG07-W122A</b>	1.0	Return to origin	5.3	0	1.3	5.3

\* Return to origin means that is performed return to origin type 4 using DS102/DS112/D200 controller.  
 \* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

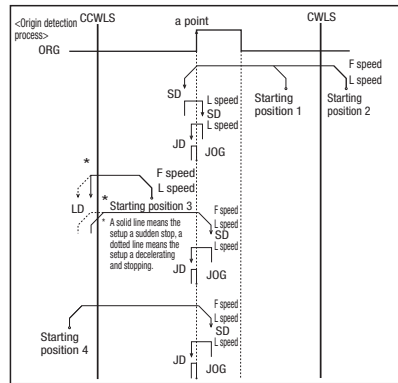
**KG07/KA07 recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

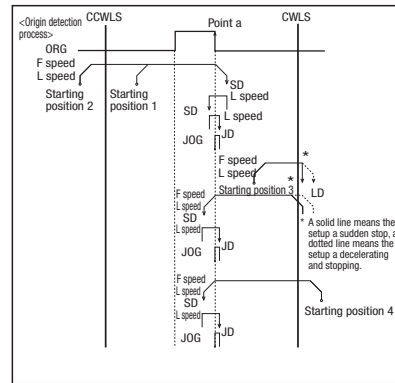
**Select return to origin type from the followings when use the slit origin sensor (ORG2).**

- Type 1: Detect in the direction of CCW and perform detected process for CW edge(point a) of NORG signal.Next detect an edge of CCW side(point b) of ORG signal.
- Type 2: Detect in the direction of CW and perform detected process for CCW edge of NORG signal.Next detect on edge of CW side (point b) of ORG signal.
- Type 7: After finished type1, perform detected process for CCW edge of TIMING signal.
- Type 8: After finished type2, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Ball  
Screw

Worm  
Gear

φ40

φ50

φ60

φ70

φ80

φ100

φ120

Other

1

166

## Sinemotion Rotary Stage Guidance



Rotation stage with ball bearing.  
It is ideal for fine angle stepping repeatability.

### Usage

- For posture controlled
- For lens or LD panel bonding

## Sinemotion rotary stage guidance

### High durability type

Backlash by the abrasion was concerned about by the worm gear type when continued being driven at a microangle repeatedly.  
We have succeeded in making travel mechanism a ball screw from a worm gear.

### Improvement acceleration/deceleration

Can be smooth starting and acceleration because of low friction.

### Reduce the backlash

Reduce the backlash with preload mechanism.

### Travel distance and constant speed

The linear movement of a ball screw is converted into rotational movement by bearings in the stage.  
(The travel distance of ball screw is not the same as the travel angle of the stage because linear movement is converted into rotational movement).  
As a result, the resolution per pulse is different between the stroke center and the end.  
The rotation speed is not stable even when sending pulse signals at a constant speed.

### Equipment for calculating the travel distance

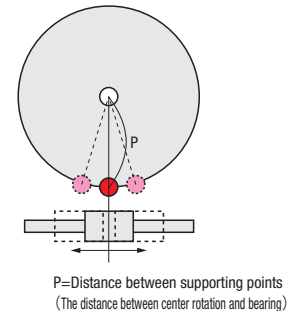
\*An equation on the basis of the stroke center.

- (1)  $\text{Travel angle} = \text{Arcsin}((\text{Input pulse} \times X) / P)$
- (2)  $\text{Input pulse} = P \times \sin(\text{travel distance}) / X$

### Definition

Definition	Value	Unit
Distance between supporting points P	17	mm
Ball screw lead	1	mm
Motor basic step angle	0.72	Degree
Ball screw travel length per pulse X	0.002	mm

\* Distance between supporting points are different from the stage.



### Basic specification

Model	Motor basic step angle	Distance between supporting points P
KRB04017	0.72°	17mm
KRB06011	0.72°	27mm

Contact us for details of the equation.

## For proper operation

### Mounting

KRB04017: Fix 3 position with supplied screw.  
KRB06011: Fix with supplied screws to 3 position of lower plate.

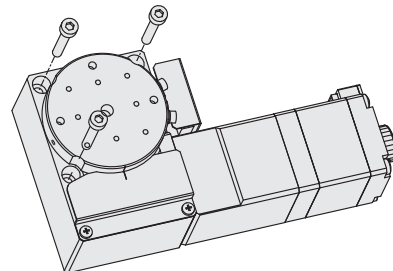
### About the object that mounted on upper/bottom of stage.

When a stage is mounted on uneven or an object that is uneven, the stage table may deformed, and may also affected the accuracy.  
[Approximate flatness: up to 10μm]

### Position of stage mounting

All products SPEC shows must be shown flat setting condition.  
Pay attention to mount such as up side down, vertical on the side and horizontal on the side.  
Load capacity and accuracy might be changed by the positioning.  
Please feel free to ask us for more information.

• KRB04017: Fit the hole of the upper table with the installation hole



# Sinemotion Rotary Stage $\phi 40/\phi 60$ : KRB04/KRB06

Rotation stage with ball bearing. It is ideal for fine angle stepping repeatability.

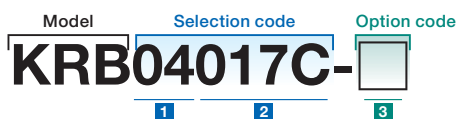
Freely customize the motor

Original

RoHS

CAD 2D·3D

See page P.009



### 1 Table size

04	$\phi 40\text{mm}$
06	$\phi 60\text{mm}$

\* Cannot choose 04011 and 06017.

### 2 Travel length

017	$\pm 8.5^\circ$
011	$\pm 5.5^\circ$

### 3 Cable option

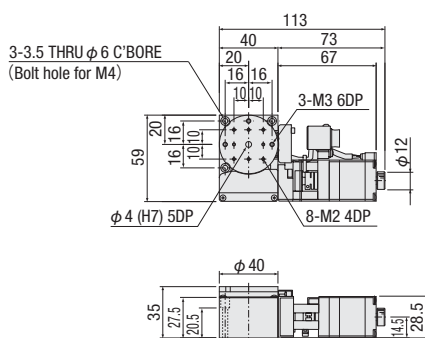
Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included(Standard)	—

\* If you choose the option specification, please add the difference to standard price. Need a purchase of additional for set of axis  
 \* One end loose position to only stage opposite side.  
 \* See page P.1-207, 209~ for details of cable.  
 \* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

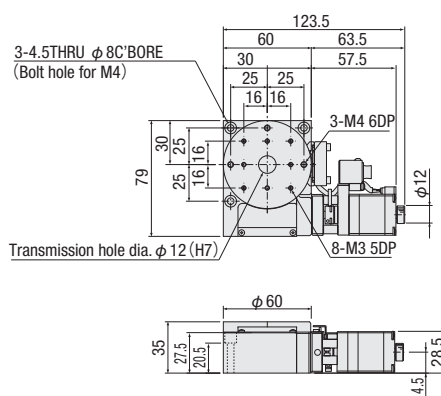
Cable P.1-207~  
 Electrical specification P.1-171~

## Dimensional outline drawings

### KRB04017C



### KRB06011C



		SPEC	
Model		KRB04017C	KRB06011C
Mechanical specification	Travel length	$\pm 8.5^\circ$	$\pm 5.5^\circ$
	Table size	$\phi 40\text{mm}$	$\phi 60\text{mm}$
	Travel mechanism	Ball screw $\phi 6$ lead 1	
	Guide	Combination angular ball bearing	
Main materials-Finishing		Aluminum—Black almite finishing	
Weight		0.5kg	0.7kg
Accuracy specification	Resolution/Pulse	$\approx 0.0067$ (Full)	$\approx 0.0042$ (Full)
	MAX speed*	$102^\circ/\text{sec}$ [15kHz]	$64^\circ/\text{sec}$ [15kHz]
	Repeatability positioning accuracy	Within $\pm 0.003^\circ$	
	Load capacity	4.0kgf [39.2N]	6.0kgf [58.8N]
	Moment stiffness	$0.52^\circ/\text{N} \cdot \text{cm}$	$0.25^\circ/\text{N} \cdot \text{cm}$
	Lost motion	0.003°	
Backlash		0.01°	
Parallelism		Within $50\mu\text{m}$	
Sensor	Limit sensor	Installed	
	Origin sensor	—	
	Slit origin sensor	—	
Provided screw (Hexagon-headed bolt)		3 of M3—25	3 of M4—25

\*See page P.1-169 if you require exact calculations.

\* The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

Motorized Rotary Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

$\phi 100$

$\phi 180$

Other

## Electrical Specification: KRB04/KRB06

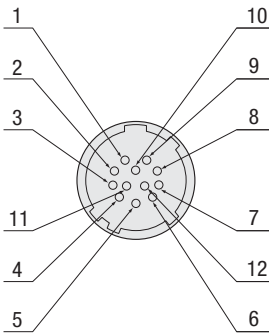
### Electrical specification

Models		KRB04017C	KRB06011C
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)	
	Model (*2)	C005C-90215P	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	—	
	Slit origin sensor	—	
	Model	Photo microsensor PM-R24 (SUNX)	
	Power voltage	DC5~24V±10%	
	Consumption current	30mA or less (15mA or less per 1 sensor)	
	Control output	NPN open collector output DC30V or less/50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA	
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)	

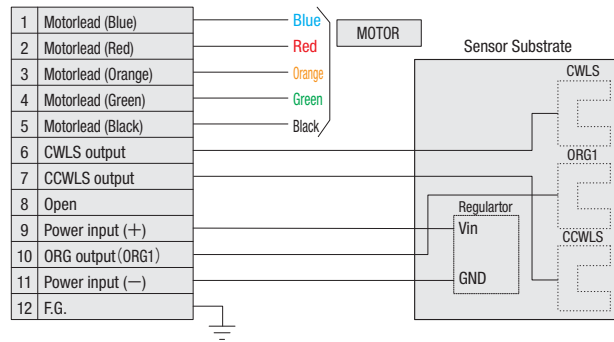
\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

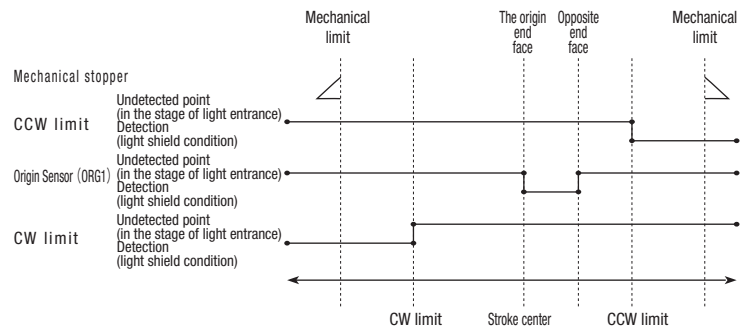
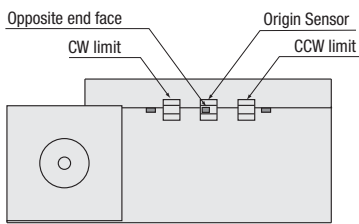
### Pin allocation



### Connection diagram



### Timing chart



Unit [deg.]	Direction of CW	Reference coordinate	CW Limit	Stroke center	Opposite end face	Direction of CCW	CCW Limit
φ39							
φ40		Stroke center	9.0	0	4.5		9.0
φ59		Stroke center	6.0	0	2.5		6.0

\* The coordinate is a basis of design value.

\* Please note ±0.5 [deg.] difference.

Note: The timing chart shows only timing of sensor, it is not for output signal logic.  
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.  
Output signal logic will be different depends on your controller.

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

X
XY
Z
Horizontal Z
XYZ
Goniometer
Rotary
Unit
Controller

**Method for return to origin**

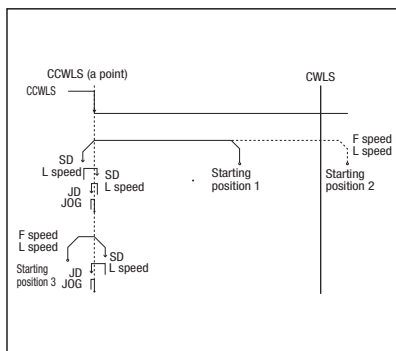
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly.  
 Set to the way of recommendation return origin when using our controller.

**■KRB04017/KRB06011 recommended return to origin Return to origin sequence ▶P.1-201~**

- Type 5: Detect in the direction of CCW and perform detected process for CW edge of CWLS signal.
- Type 6: Detect in the direction of CW and perform detected process for CCW edge of CWLS signal.
- Type 11: After finished type5, perform detected process for CCW edge of TIMING signal.
- Type 12: After finished type6, perform detected process for CW edge of TIMING signal.

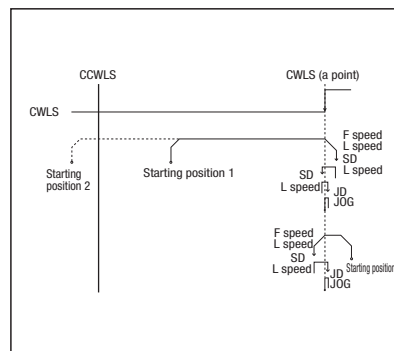
**[Type3]**

Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.



**[Type6]**

Detect in the direction of CW and perform detected process for CCW edge of CWLS signal.



**Adaptive driver**

**■ Driver ▶P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

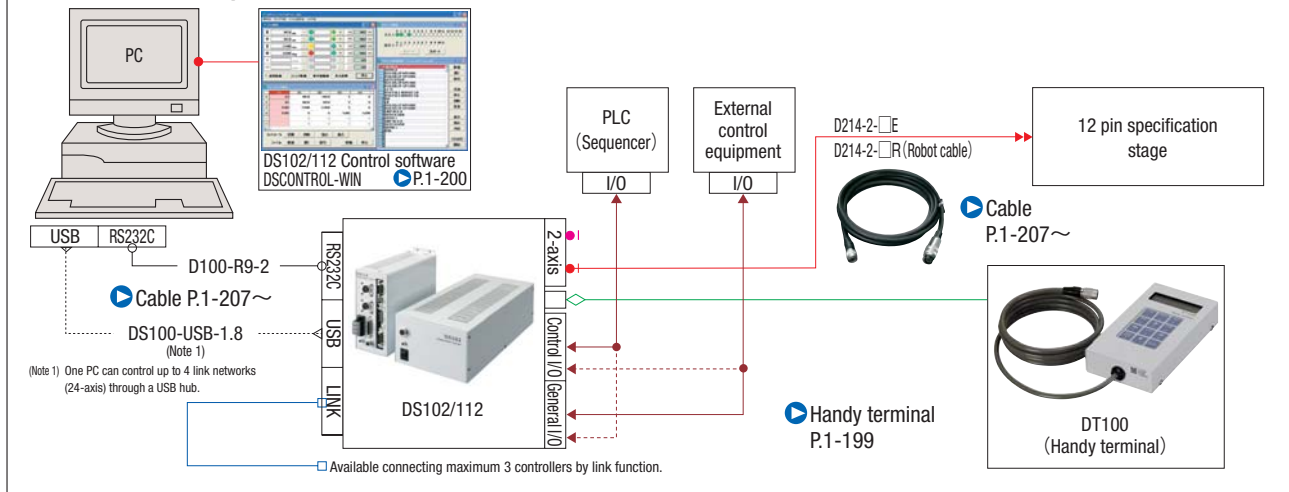
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**■ Controller ▶P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**■ Connection example**



Ball Screw

Worm Gear

Direct Drive

φ39

φ40

φ59

φ60

φ75

φ100

φ180

Other



# Motorized Stage

## Rotary Stage $\phi 39/\phi 59$ : KRW04/KRW06

Motorized Rotary Stage

KRW04360



KRW06360C



KRW06360C-Z



**Freely customize the motor**

RoHS

See page P.009

- Good for accuracy positioning at wide angle and 360° continuously rotation.
- Vertical type can be used as a cable organization and polarizing elements rotation.

■ Available for motorized polarizer with adaptor.  
FPW06360C ▶ P.3-103

■ Low price motorized rotation stage  
KRE series line up  
▶ P.1-177~



Model Selection code Option code

**KRW** **04360** -

1 2 3 4

▶ Cable P.1-207~  
▶ Electrical specification P.1-175~

### 1 Table size

04	$\phi 40\text{mm}$
06	$\phi 60\text{mm}$

### 2 Travel length

360	360°
-----	------

※Table size code 06: 360C

### 3 Mounting

Code	Specification
Blank	Horizon
Z	Vertical

\* Z is only for KRW06.

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

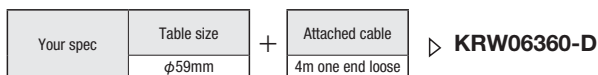
\* One end loose position to only stage opposite side.

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

\* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

### Selection Example



		SPEC		
Model		KRW04360	KRW06360C	KRW06360C-Z
Mechanical specification	Travel length		360°	
	Table size	$\phi 39\text{mm}$	$\phi 59\text{mm}$	
	Travel mechanism (Reduction ratio)	Worm gear (Reduction ratio 1/120)		Worm gear (Reduction ratio 1/180)
	Guide	Deep groove ball bearing		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Weight	0.4kg	0.6kg	0.7kg
	Resolution/Pulse	0.006° (Full)	0.004° (Full)	
	MAX speed	30°/sec [5kHz]	20°/sec [5kHz]	
	Positioning accuracy	Within 0.05°		
	Repeatability positioning accuracy	Within $\pm 0.01^\circ$		
	Load capacity	3.0kgf [29.4N]		1.0kgf [9.8N]
	Moment stiffness	0.74"/N · cm	0.84"/N · cm	
	Lost motion	Within 0.05°		
	Backlash	Within 0.1degree		Within 0.05°
	Parallelism	Within 50 $\mu\text{m}$		
Sensor	Eccentricity	Within 5 $\mu\text{m}$		
	Runout	Within 30 $\mu\text{m}$		
	Limit sensor	—		
	Origin sensor	Installed		
Other	Provided screw (Hexagon-headed bolt)	3 of M3—30	3 of M4—30	4 of M4—6

Dimensional outline drawings



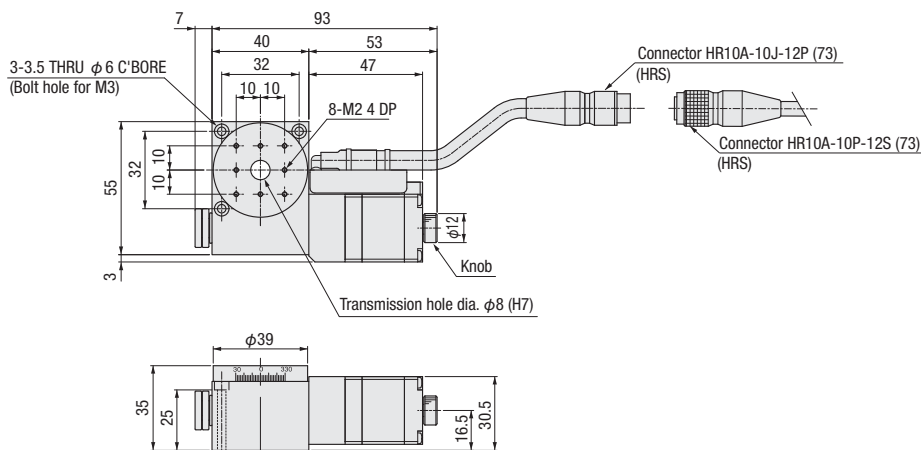
CAD COMMUNITY

CAD DATA

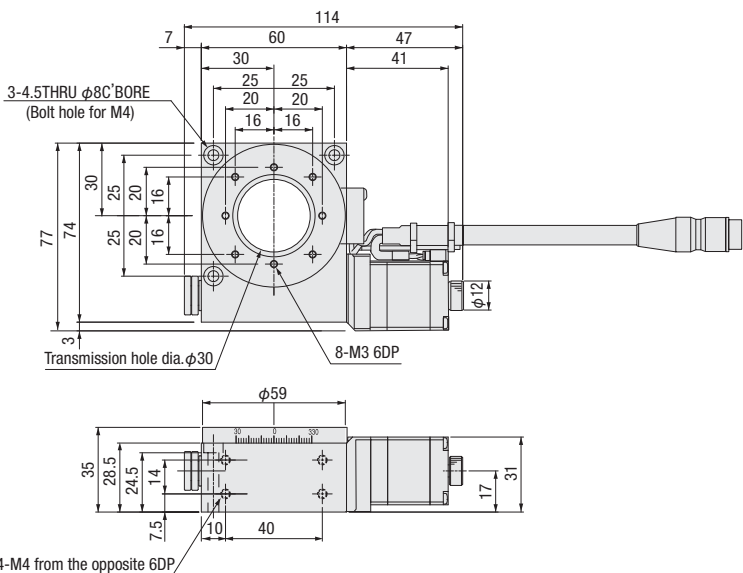


CAD 3D-2D

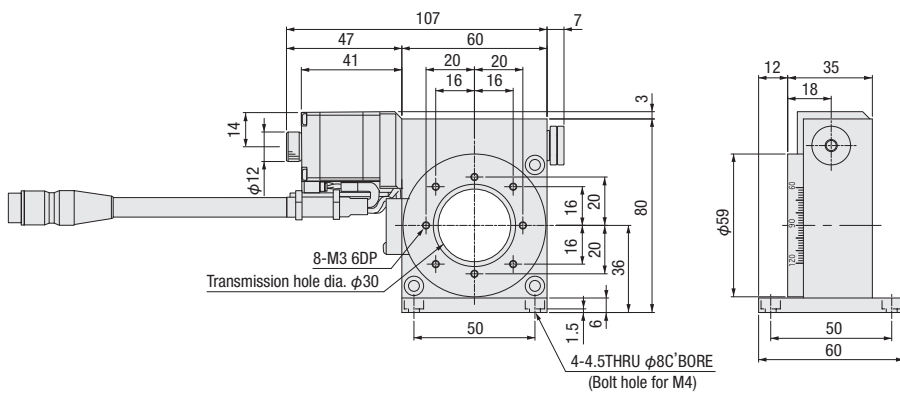
KRW04360



KRW06360C



KRW06360C-Z



Motorized Rotary Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

$\phi 100$

$\phi 180$

Other

1

174

## Electrical Specification: KRW04/KRW06

### Electrical specification

Models		KRW04360	KRW06360C	KRW06360C-Z
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)		
	Model (*2)	C005C-90215P		
	Step angle	0.72°		
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)		
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		
Sensor	Limit sensor	—		
	Origin sensor	Installed		
	Slit origin sensor	—		
	Model	Photo microsensor EE-SX4134 (Omron Co.,Ltd.)		
	Power voltage	DC5~24V ±10%		
	Consumption current	35mA or less		
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA		
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)			

\*1 See page P.1-213~ for details of single motor specification. \*2 Model is our own management model.

### Available sensor DC5V~24V.

This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

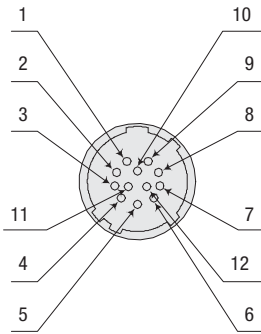
It used to require the K-PCBA24 when the former products are driven by use of a motion control board or programable logic controller (PLC) without our controller.

### Note

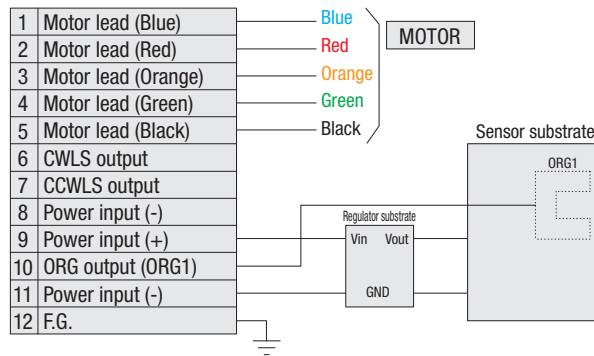
Must be wired without sensor amplifier substrate when our customer who uses the former stages KS401-40, -60, KS431-60 and amplifier substrates will be replaced with KRW stages.

We have variety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

### Pin allocation



### Connection diagram



### Timing chart

#### KRW04360/KRW06360C

Origin . . . Detect in scale 0 (Dark)  
(Return to origin is performed type 4 of returning origin by use of DS102/DS112 controller)

	Origin detected scale position [°]
KRW04360	0 (The end face of the origin: The end face of the origin:CCW side edge of shield plate)
	11 (Opposite end face : Opposite side of the end face: CW side edge of shield plate)
KRW06360C	0 (The end face of the origin: The end face of the origin:CCW side edge of shield plate)
	9 (Opposite end face : Opposite side of the end face: CW side edge of shield plate)

Note: The direction of CW/CCW in timing chart shows motor rotation. Upper plate rotation in CW as below.  
KRW04360: CW KRW06360: CW

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

φ39

φ40

φ59

φ60

φ75

φ100

φ180

Other

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

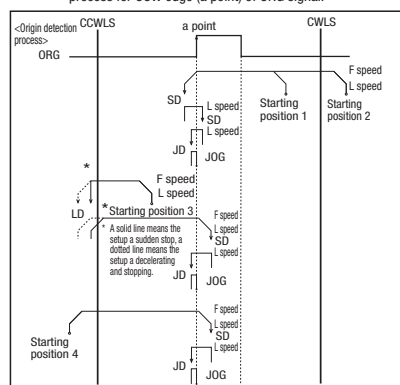
**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

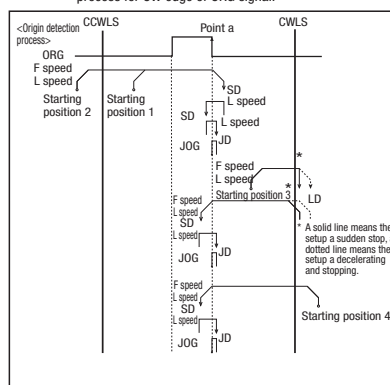
**KRW04360/KRW06360C recommended return to origin** Return to origin sequence **P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver** **P.1-205~**

DC24V type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

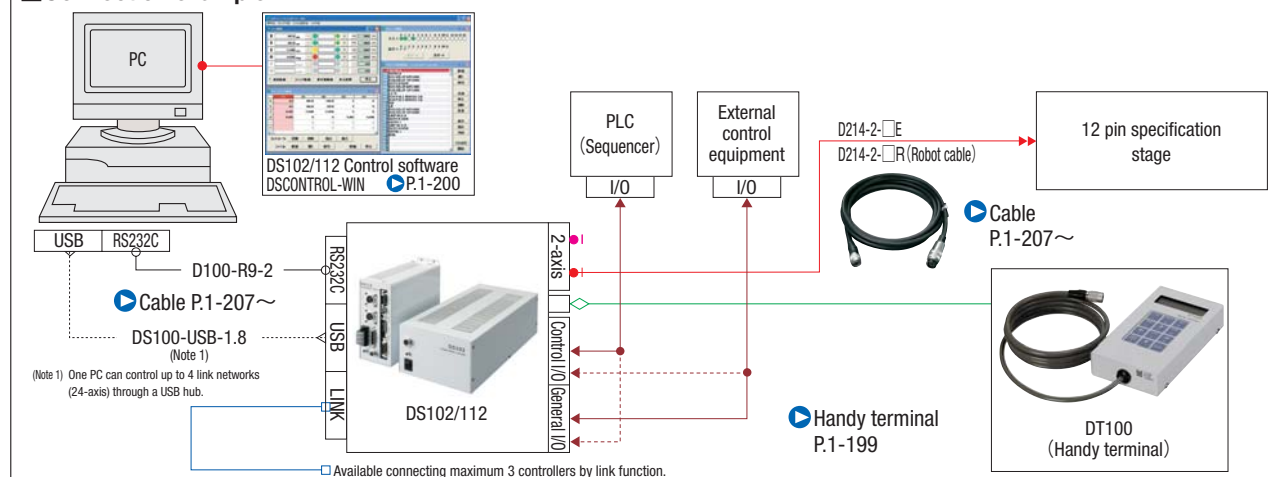
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller** **P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connection example**



Ball Screw

Worm Gear

Direct Drive

- φ39
- φ40
- φ59
- φ60
- φ75
- φ100
- φ180
- Other

# Motorized Stage

## Rotary Stage: KRE04360/KRE06360

Motorized Rotary Stage

KRE04360



KRE06360



RoHS

\* The photo shows an image.  
The holes and the shape may differ in certain respects from the actual product.

X

XY

Z

Horizontal  
Z

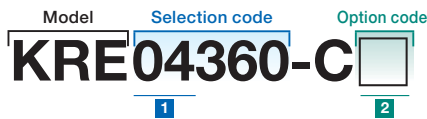
XYZ

Goniometer

Rotary

Unit

Controller



● Cable P.1-207~  
● Electrical specification P.1-179~

### 1 Table size

04	φ39mm
06	φ60mm

### 2 Cable option

Code	Specification	Cable type
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* If you choose the option specification, please add the difference to standard price.  
Electrical specification ● P.1-179~  
\* See page ● P.1-207, 209~ for details of cable.  
\* Please select "Code F or H" when connect with stepping motor controller(DS102/112).

Ball  
Screw

Worm  
Gear

Direct  
Drive

φ39

φ40

φ59

φ60

φ75

φ100

φ180

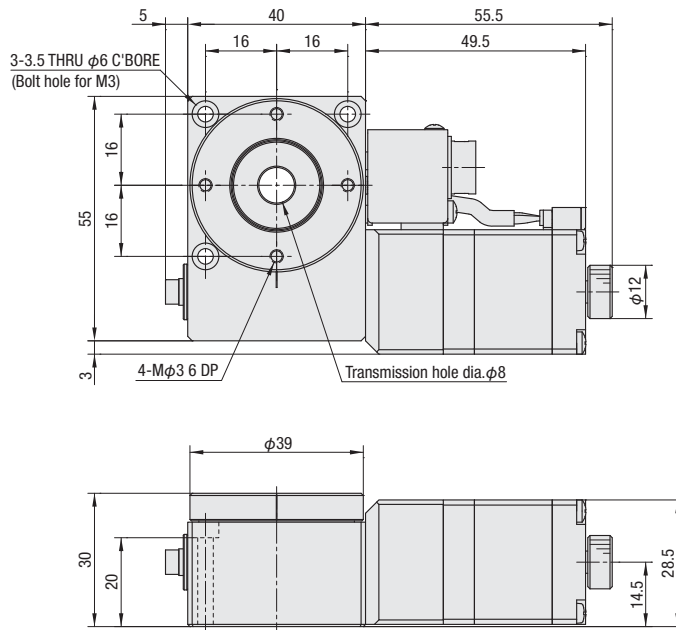
Other

## SPEC

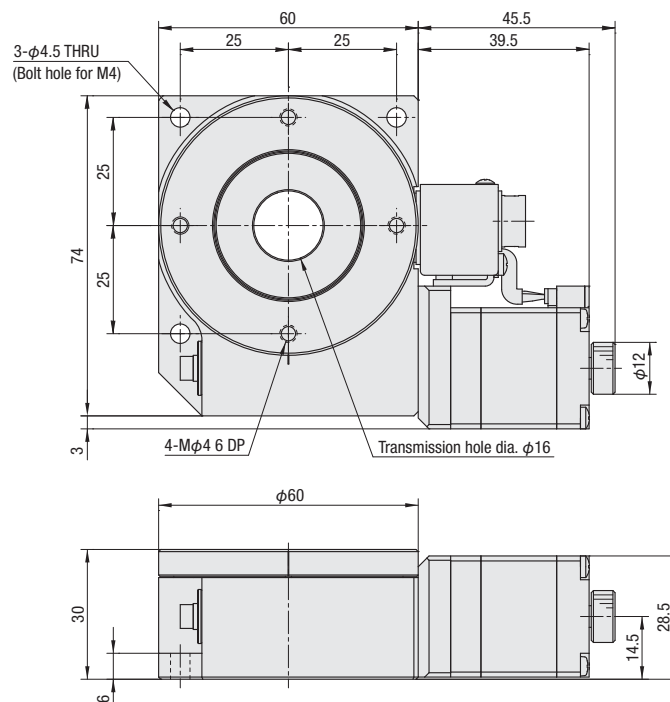
Model	KRE04360-C		KRE06360-C
			360°
Mechanical specification	φ39mm		φ60mm
Travel length			
Table size			
Travel mechanism (Reduction ratio)	Worm gear (Reduction ratio 1/90)		Worm gear (Reduction ratio 1/120)
Guide	Deep groove ball bearing		
Main materials-Finishing	Aluminum—Black almite finishing		
Weight	0.36kg		0.50kg
Accuracy specification	0.008°(Full)		0.006°(Full)
Resolution (Pulse)	40°/sec		30°/sec
MAX speed			
Positioning accuracy	Within 0.1degree		
Repeatability positioning accuracy	Within ±0.05°		
Load capacity	3kgf [29.4N]		
Lost motion	Within 0.1degree		
Parallelism	Within 50μm		
Sensor	Limit sensor		—
Origin sensor			Installed
Other	Provided screw (Hexagon-headed bolt)		
	3 of M3—25		3 of M4—12

Dimensional outline drawings

**KRE04360**



**KRE06360**



Motorized Rotary Stage

X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball  
Screw

Worm  
Gear

Direct  
Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

$\phi 100$

$\phi 180$

Other

1

178

## Electrical Specification: KRE04360/KRE06360

### Electrical specification

Models		KRE04360-C	KRE06360-C
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase	
	Maker	Oriental Motor Co.,Ltd.	
	Model (*2)	C005C-90215P	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12PC (71) (Hirose Electric Co.,Ltd.)	
	Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Origin sensor	Installed	
	Model	Photo microsensor EE-SX4134 (Omron Co.,Ltd.)	
	Power voltage	DC5~24V ±10%	
	Consumption current	35mA or less	
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA	
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)	

\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

X

XY

Z

Horizontal  
Z

XYZ

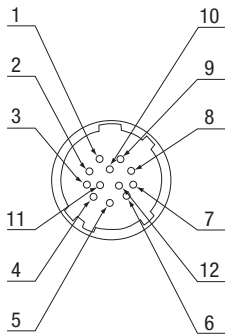
Goniometer

Rotary

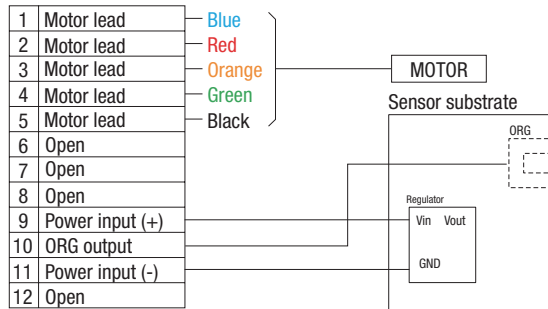
Unit

Controller

### Pin allocation



### Connection diagram



\* When use DS102/DS112 controller, setup the sensor logic as below.

- Limit sensor logic: A (N.O.)
- Origin sensor logic: B (N.C.)

### Timing chart

Unit [°]

	Origin detected scale position [°]
<b>KRE04360</b>	0 (The end face of the origin: CCW side edge of the douser.) 6 (Opposite side of the end face: CW side edge of the douser.)
<b>KRE06360</b>	0 (The end face of the origin: CCW side edge of the douser.) 4 (Opposite side of the end face: CW side edge of the douser.)

\* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.

\* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 deg.

Ball  
Screw

Worm  
Gear

Direct  
Drive

φ39

φ40

φ59

φ60

φ75

φ100

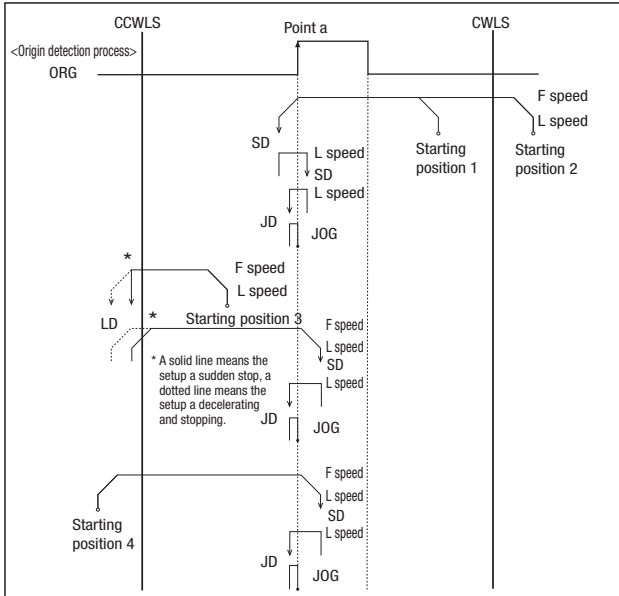
φ180

Other

**KRE series recommendation return to origin method**

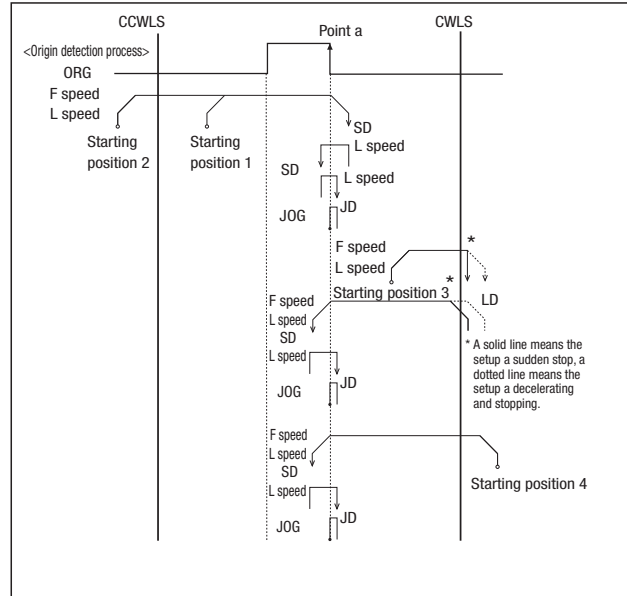
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Typ10]** After finished Type4, perform detected process for CW edge of TIMING signal.

Return to origin sequence [P.1-201~](#)

**Adaptive driver**

■ **Driver** [P.1-205~](#)

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

■ **Controller** [P.1-197~](#)

Input power	General-purpose input/output port	Driver type (Divisions)	
		Normal (Full/Half)	Micro step (1~1/250 [16 steps])
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102

Motorized Rotary Stage

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Ball Screw

Worm Gear

Direct Drive

- φ39
- φ40
- φ59
- φ60
- φ75
- φ100
- φ180
- Other



# Motorized Stage

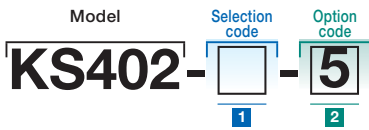
## Rotary Stage $\phi 75/\phi 100/\phi 180$ : KS402

RoHS



■ Good for accuracy positioning at wide angle and 360° continuously rotation.

■ Transmission type would be suitable for rotating polarizing elements and organization cables.



● Cable P.1-207~  
● Electrical specification P.1-183~

### 1 Table size

75	$\phi 75\text{mm}$
100	$\phi 100\text{mm}$
180	$\phi 180\text{mm}$

### 2 Cable option

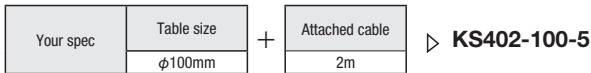
Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

### Selection Example



		SPEC		
Model		KS402-75-5	KS402-100-5	KS402-180-5
Mechanical specification	Travel length	360°		360°
	Table size	$\phi 75\text{mm}$	$\phi 100\text{mm}$	$\phi 180\text{mm}$
	Travel mechanism (Reduction ratio)	Worm gear (1/144)	Worm gear (1/180)	Worm gear (1/180)
	Guide	Receiving cross roller axis	Combination angular ball bearing	Combination angular ball bearing
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Weight	1.1kg	2.5kg	9.7kg
	Resolution	0.0025°/Pulse (Full)	0.004°/Pulse (Full)	0.004°/Pulse (Full)
	MAX speed	25°/sec [10kHz]	20°/sec [5kHz]	20°/sec [5kHz]
	Positioning accuracy	Within 0.03°		
	Repeatability positioning accuracy	Within $\pm 0.005^\circ$		
	Load capacity	10kgf [98N]	15kgf [147N]	30kgf [294N]
	Moment stiffness	0.15"/N · cm	0.07"/N · cm	0.02"/N · cm
	Lost motion	Within 0.005°	Within 0.004°	Within 0.01°
	Backlash	Within 0.005°	Within 0.004°	Within 0.01°
	Parallelism	Within 120 $\mu\text{m}$		
Sensor	Eccentricity	Within 5 $\mu\text{m}$		
	Runout	Within 20 $\mu\text{m}$		Within 60 $\mu\text{m}$
	Limit sensor	Installed (Switch)		Installed (Switch)
	Origin sensor	Installed		
	Proximity origin sensor	—		
	Provided screw (Hexagon-headed bolt)	4 of M4—10	4 of M6—15	4 of M6—12

\* Model  an unsupported RoHS.

Motorized Rotary Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

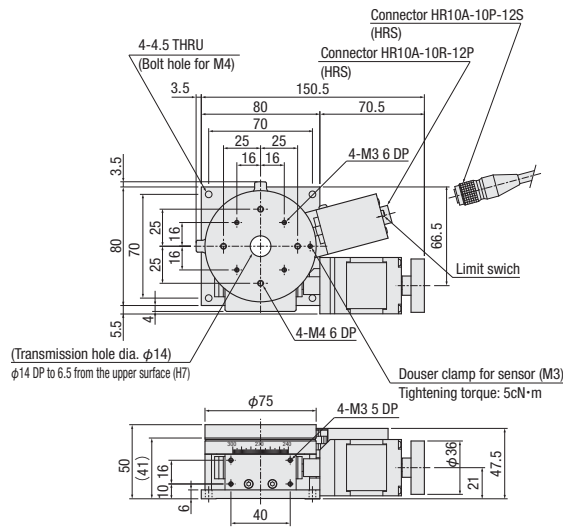
$\phi 100$

$\phi 180$

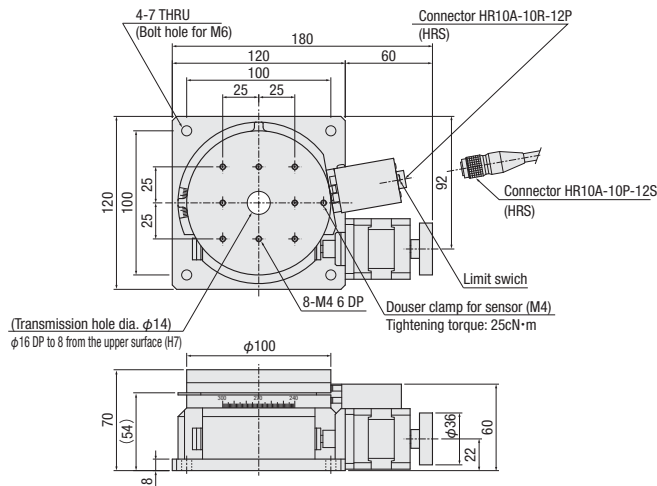
Other

Dimensional outline drawings

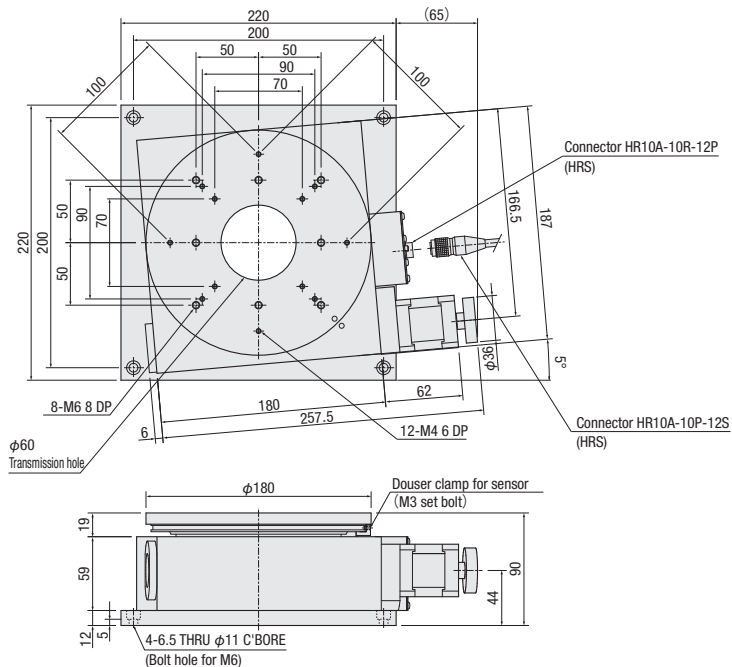
KS402-75



KS402-100



KS402-180



Motorized Rotary Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

$\phi 100$

$\phi 180$

Other

1

182

## Electrical Specification • Option: KS402

### Electrical specification

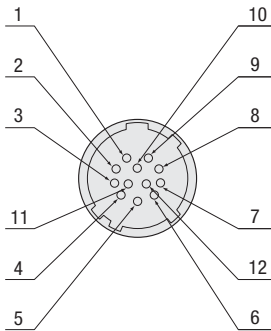
Models		KS402-75	KS402-100	KS402-180
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)		
	Model (*2)	C7214-9015-1	PK544-NB-C16	
	Step angle	0.36°		
Connector	Model	HR10A-10R-12P (73) (Hirose Electric Co.,Ltd.)		
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)		
Sensor	Limit sensor	Installed (PM-F24)		Installed (PM-F24,R24)
	Origin sensor	Installed (PM-F24)		Installed (PM-L24)
	Slit origin sensor	—		
	Model	Photo microsensor PM-□24 (Panasonic Industrial Devices SUNX)		
	Power voltage	DC5~24V ±10%		
	Consumption current	45mA or less (Per 1 sensor 15mA)		
	Control output	NPN open collector output DC30V or less 50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA		
	Output logic	CWLS,CCWLS On detection (light shield condition): Output transistor OFF (Non-continuity) ORG Light on: Output transistor becomes OFF (Non-continuity)	On detection (light shield condition): Output transistor OFF (Non-continuity)	

\*1 See page P.1-213~ for details of single motor specification.

\*2 Model is our own management model.

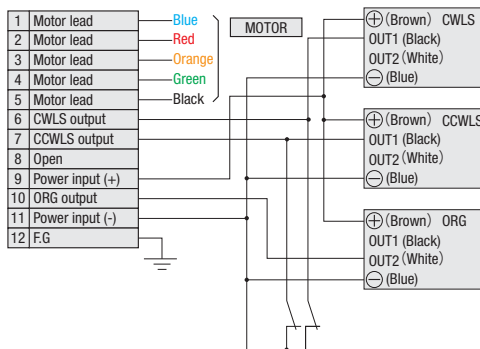
- Can be reset the limit function in KS402-75, 100, 180 by the switch.
- Can be set any traveling angle because of changeable shield plate position

### Pin allocation

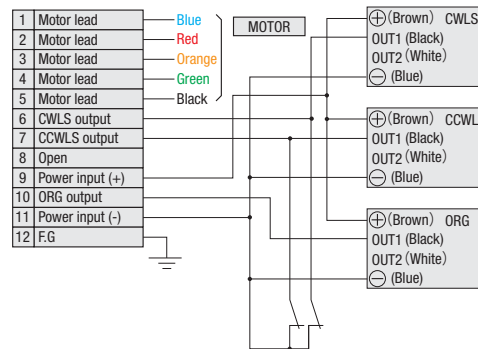


### Connection diagram

#### KS402-75/KS402-100



#### KS402-180



### Timing chart

#### KS402-75, KS402-100, KS402-180 (Detect only KS402-180 (dark))

Origin · · · Detect in scale 0 (Dark)

(Return to origin is performed type 4 of returning origin by use of DS102/DS112 controller)

CW and CCW limit · · · Any changeable position

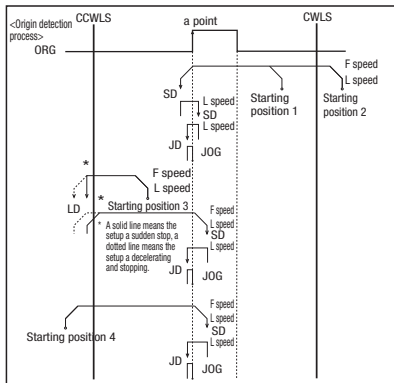
**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

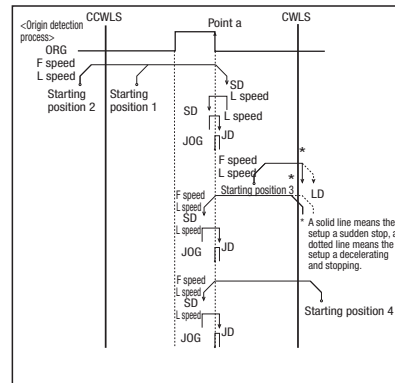
**KS402 series recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24V type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

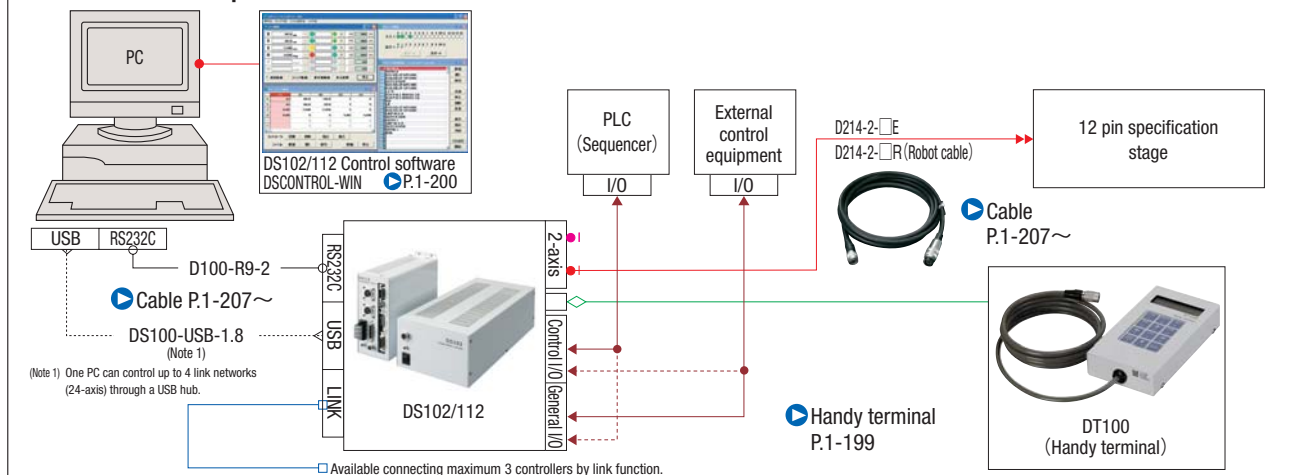
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connection example**



- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Ball Screw

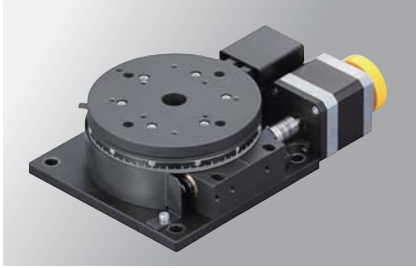
Worm Gear

Direct Drive

- φ39
- φ40
- φ59
- φ60
- φ75
- φ100
- φ180
- Other

## Motorized Rotary Stage: KRE10360

KRE10360



RoHS

\* This photos shows a cover psition is an image. The holes and the shape may differ in certain respects from the actual product.

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

Model Selection code Option code

**KRE10360-**      

1 2

C Cable P.1-207~  
E Electrical specification P.1-179~

### 1 Table size

10	φ100mm
----	--------

### 4 Cable option

Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Cable is not included (Standard)	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK
Blank	Cable is not included (Standard)	—

\* The one end loose side might be on an opposite side of stage.

\* If you choose the option specification, please add the difference to standard price.  
See page Page [P.1-207, 209](#)~ for more cable details.

\* Please select "blank, A, C, F, H" when connect with stepping motor controller(DS102/112).

- Ball Screw
- Worm Gear

- Direct Drive
- φ39
- φ40
- φ59
- φ60
- φ75
- φ100
- φ180
- Other

### SPEC

Model		KRE10360-C
Mechanical specification	Travel length	360°
	Table size	φ100mm
	Travel mechanism (Reduction ratio)	Worm gear(1/90)
	Guide	Deep groove ball bearing
	Material of stage	Aluminum—Al-Bronze
Accuracy specification	Mass	1.8kg
	Resolution	0.008°/Pulse(Full)
	MAX speed	40°/sec[5kHz]
	Positioning accuracy	Within 0.05°
	Repeatability positioning accuracy	Within ±0.01°
	Load capacity	15kgf [147N]
	Moment stiffness	0.08"/N · cm
	Lost motion	Within 0.02°
	Back Rush	Within 0.02°
	Paralleism	Within 120μm
	Eccentricity	Within 5μm
Sensor	Runout	Within 35μm
	Limit sensor	Installed (Switch)
	Origin sensor	Installed

X

XY

Z

Horizontal  
Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball  
Screw

Worm  
Gear

Direct  
Drive

φ39

φ40

φ59

φ60

φ75

**φ100**

φ180

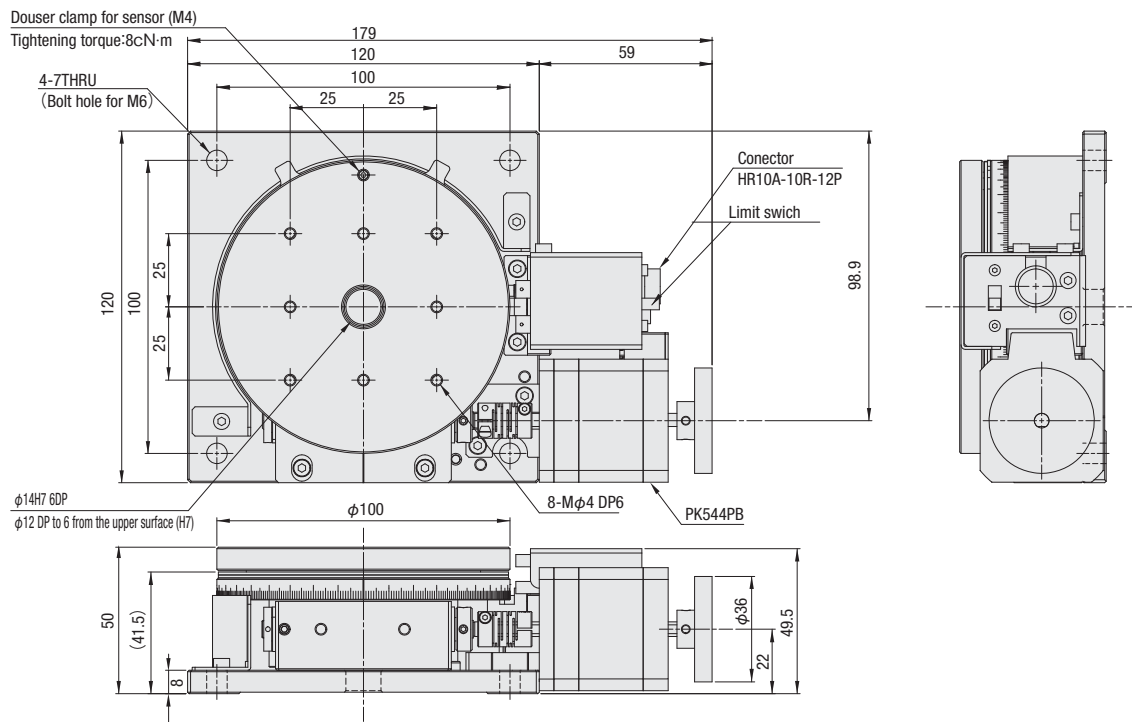
Other

1

186

Dimensional outline awings

**KRE10360**



### Electrical specification

Model		KRE10360
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)
	Model (*2)	PK544PB
	Step angle	0.72°
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)
	Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)
Sensor	Limit sensor	Installed (PM-R24)
	Origin sensor	Installed (PM-F24)
	Slit origin sensor	—
	Model	Photo microsensor PM-□24 (Panasonic Industrial Devices SUNX)
	Power voltage	DC5~24V ±10%
	Consumption current	45mA or less (Per 1 sensor 15mA)
	Control output	NPN open collector output DC30V or less 50mA or less Residual voltage 0.7V or less when the load current is 50mA Residual voltage 0.4V or less when the load current is 16mA
Output logic	CWLS,CCWLS	On detection (light shield condition): Output transistor OFF (Non-continuity)
	ORG	Light on: Output transistor becomes OFF (Non-continuity)

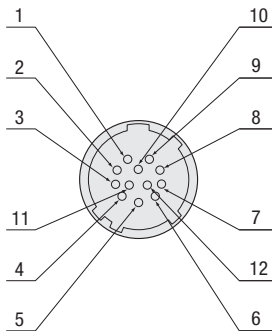
\*1 See page 1-213~ for details of single motor specification

\*2 Model is our own management model.

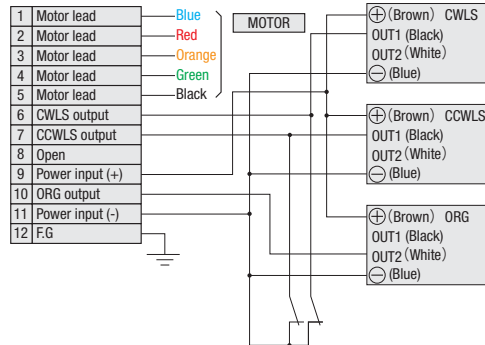
○ Can be reset the limit function in KS402-75, 100, 180 by the switch.

○ Can be set any traveling angle because of changeable shield plate position

### Pin allocation



### Connection diagram



### Timing chart

Origin . . . Detect in scale 0 (Dark)

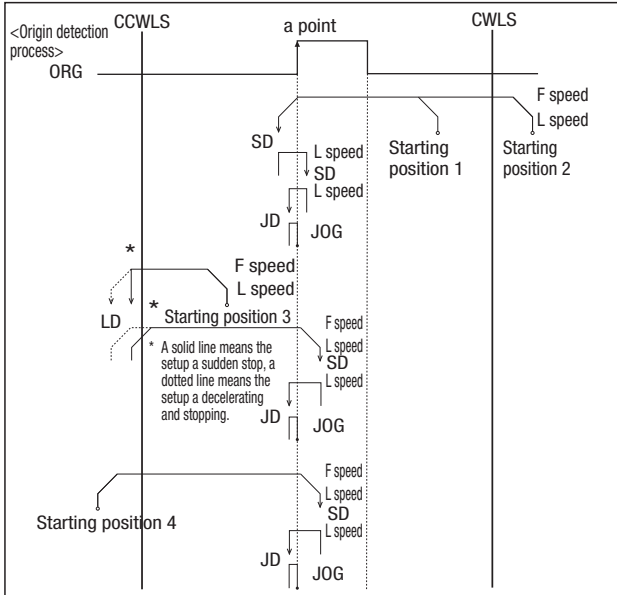
(Return to origin is performed type 4 of returning origin by use of DS102/DS112 controller)

CW and CCW limit . . . Any changeable position

**Method for return to origin**

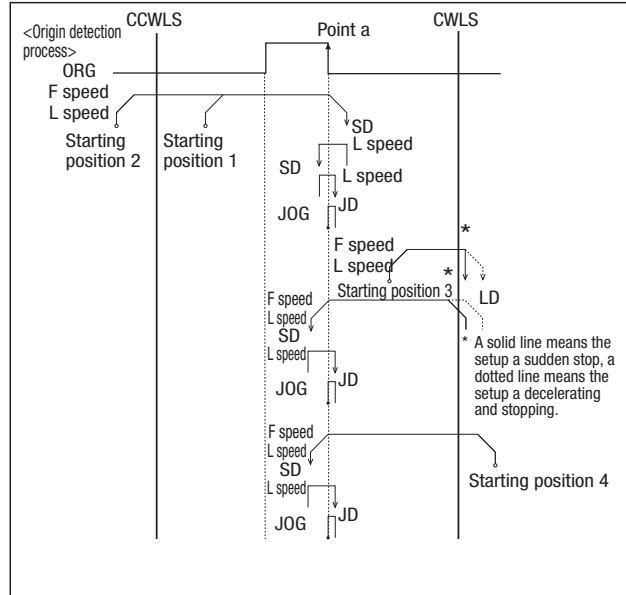
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not work correctly. Set to the way of recommendation return origin when using our controller.

**[Type 3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type 9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type 4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Type 10]** After finished Type4, perform detected process for CW edge of TIMING signal.

**Adaptive driver**

■ Driver P.1-205~

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

■ Controller P.1-197~

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250[16 steps]
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO



DS112/102



## Rotary Stage $\phi 39$ : KS451

KS451-40



RoHS

■ Good for accuracy positioning  
360° continuously rotation.

Model **KS451-40-** Option code **5**

1 2

▶ Cable P.1-207~  
▶ Electrical specification P.1-191~

### 1 Cable option

Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	Robot cable 2m one end loose	D214-2-2RK

\* If you choose the option specification, please add the difference to standard price.

\* See page P.1-207, 209~ for details of cable.

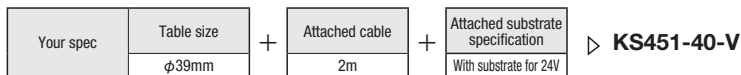
\* Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

### 2 Attached substrate specification

Code	Specification
Blank	Not available 24V supported substrate
V	Substrate for 24V Included K-PCBA24

※KS451: Sensor voltage 5V  
Consider to use sensor amplifier substrate when you control without our controller.

### Selection Example



### SPEC

Model		KS451-40-5
Mechanical specification	Travel length	360°
	Table size	$\phi 39\text{mm}$
	Travel mechanism	Direct drive motor
	Guide	Ball bearing (Deep groove ball bearing)
	Main materials-Finishing	Aluminum—Black almite finishing, stainless steel
	Weight	0.3kg
Accuracy specification	Resolution	0.72°/Pulse (Full) 0.36°/Pulse (Half)
	MAX speed	72°/sec [100Hz]
	Positioning accuracy	—
	Repeatability positioning accuracy	—
	Load capacity	1.0kgf [9.8N]
	Moment stiffness	2.50°/N·cm
	Lost motion	Within 0.05°
	Backlash	—
Sensor	Parallelism	Within 100 $\mu\text{m}$
	Runout	Within 50 $\mu\text{m}$
	Limit sensor	—
	Origin sensor	Installed
	Proximity origin sensor	—
Provided screw (Hexagon-headed bolt)		3 of M3—28

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

$\phi 39$

$\phi 40$

$\phi 59$

$\phi 60$

$\phi 75$

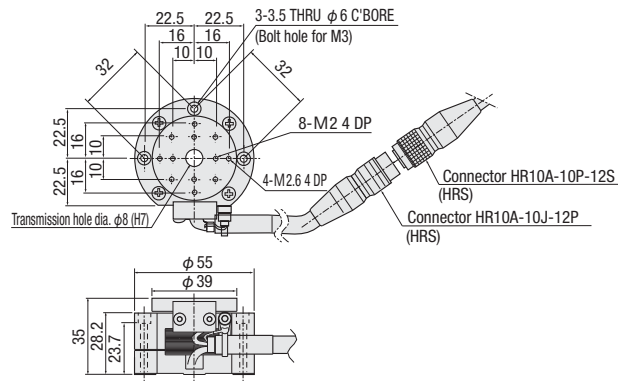
$\phi 100$

$\phi 180$

Other

**Dimensional outline drawings**

**KS451-40**



**Sensor amplifier substrate for 24V: K-PCBA24**

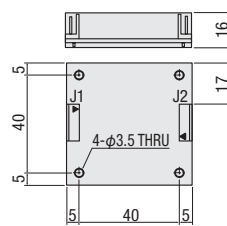
Instruction Manual R o H S

K-PCBA is needed to drive a motorized stage with EE-SX1101 sensor when using PC or sequencer's motion control module and not using our controller. EE-SX1101 sensor is operated with 5V input voltage and there is only about 1mA of output current. When using controlling equipment such as PC and sequencer, it is common to use photo coupler for sensor input-terminal and often needs about 10mA of terminal current. Therefore a motorized stage with EE-SX1101 sensor cannot be directly connected. In this case, K-PCBA is effective in being assembled as sensor amplifier so that input voltage becomes 24V and max. Output current is available up to 500mA.

**K-PCBA24**

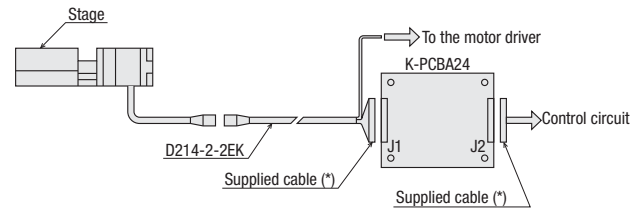


**Dimensional outline drawings**



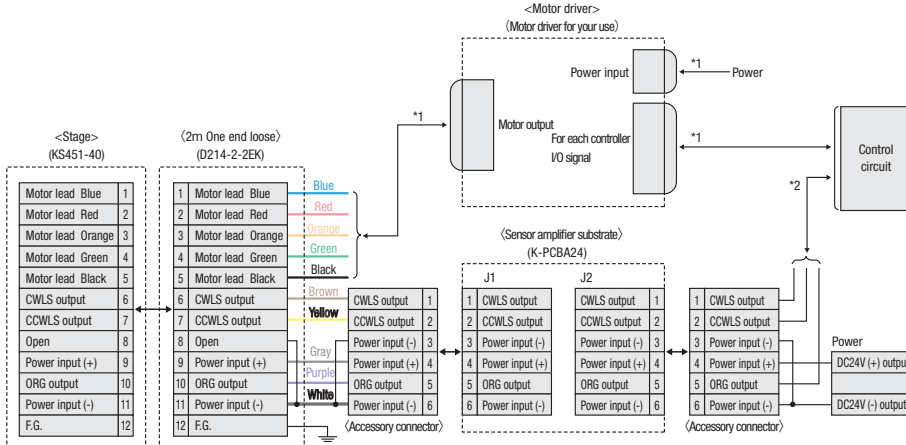
▼ mark indicates the position of connector 1 pin.

**Full diagram**



\* Crimping connection of accessory connector needs to be done by a customer

**Connection sensor amplifier and driver example**



\*1. When connecting, refer to operation manual of motor driver in application.  
 \*2. When connecting, follow the control circuit in application.

**Note that sensor damage**

**\*See sensor specification for the exclude and include this substrate.**  
**\*There are stages that no need this substrate.**

SPEC	
Model	K-PCBA24
Dimension	50 (W) × 50 (D) × 16 (H) mm
Connector type	171825-6 (Tyco Electronics Japan G.K.6)
Compatible connector	171822-6 (Accessories)
Power voltage	DC24V ± 10%
Consumption current	30mA or less
Control output	NPN open collector output DC24V 500mA or less
Specification environment	0~40°C, 20~80%RH (non-dew)
Accessories	2 of connector 171822-6 (Tyco Electronics Japan G.K. ) 12 of contact terminal 170204-1 (Tyco Electronics Japan G.K.)

\*Connector processing needs to be done by customer. Please use electric wire of which diameter is more than 0.2mm for wire arrangement.

Motorized Rotary Stage

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

Ø39

Ø40

Ø59

Ø60

Ø75

Ø100

Ø180

Other

## Electrical Specification•Option: KS451

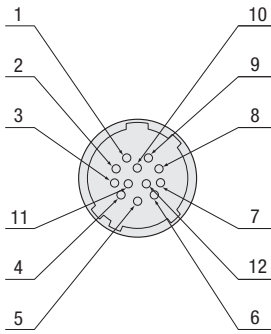
### Electrical specification

Model		KS451-40	
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase	
	Model	Special specification	
	Step angle	0.72°	
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co.,Ltd.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)	
Sensor	Limit sensor	—	
	Origin sensor	Installed	
	Slit origin sensor	—	
	Model	Photo microsensor EE-SX1103 (Omron Co.,Ltd.)	
	Power voltage	DC5V	
	Consumption current	25mA or less	
	Control output		NPN open collector output DC5V or less 1.2mA or less
			Residual voltage 0.4V or less when the load current is 0.3mA
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)	

\*1 See page P.1-213~ for details of single motor specification.

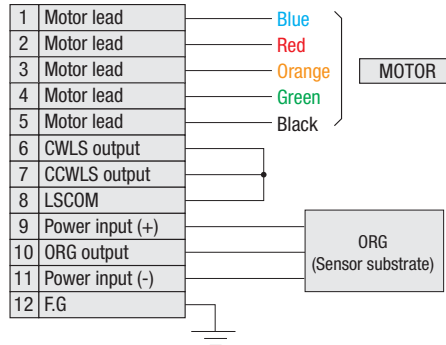
\* Please use microstep when reduce the vibration or return to origin. (Driver: CRD5107P P.1-187~)

### Pin allocation



### Connection diagram

#### KS451-40



### Timing chart

#### KS451-40

	Range of origin detection [°]
KS451-40	0~11°

Note: The direction of CW/CCW in timing chart shows motor rotation.  
Upper plate rotation in CW as below.  
KS451-40: CW

X

XY

Z

Horizontal Z

XYZ

Goniometer

Rotary

Unit

Controller

Ball Screw

Worm Gear

Direct Drive

φ39

φ40

φ59

φ60

φ75

φ100

φ180

Other

- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

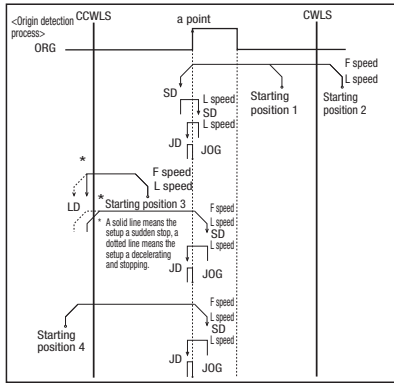
**Method for return to origin**

Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

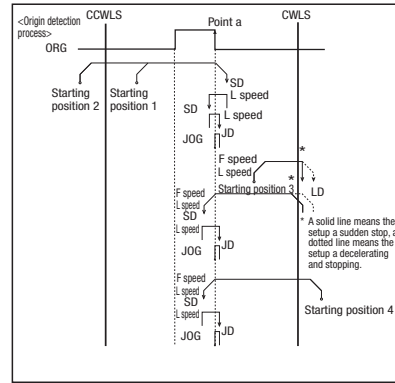
**KS451 recommended return to origin Return to origin sequence P.1-201~**

- Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
- Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
- Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
- Type 10: After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type3]** Detect in the direction of CCW and perform detected process for CCW edge (a point) of ORG signal.



**[Type4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**Adaptive driver**

**Driver P.1-205~**

DC24 type input

Model	CRD5107P	SD5107P3-A22
Divisions	1~1/250 (16 steps)	Full/Half

AC100V input

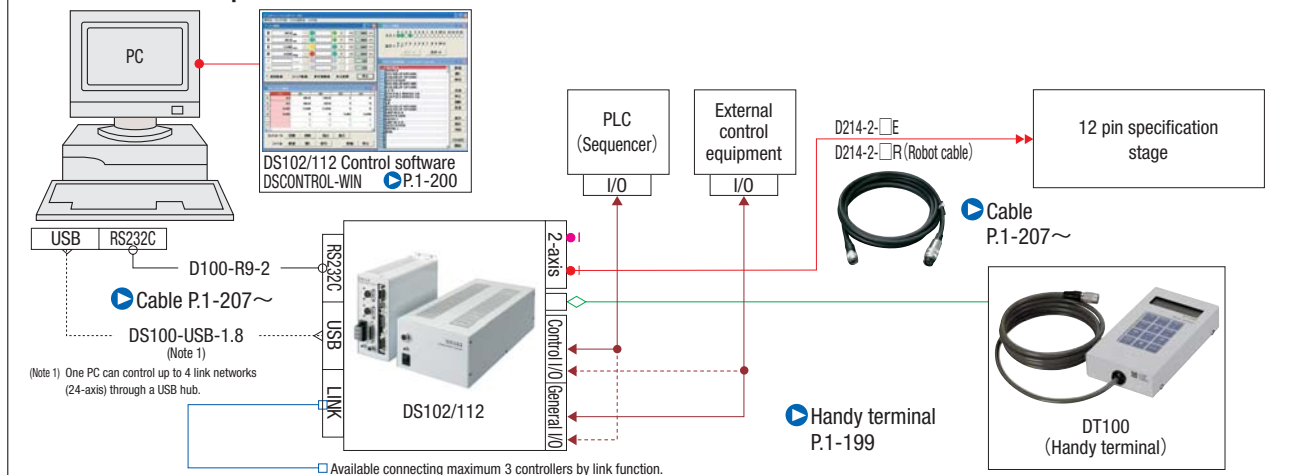
Model	RKD507-A
Divisions	1~1/250 (16 steps)

**Adaptive stepping motor controller**

**Controller P.1-197~**

Input power	General-purpose input/output port	Driver type	
		Full/Half	1~1/250 (16 steps)
AC100-240V	Without	DS102NR	DS102MS
	With	DS102NR-IO	DS102MS-IO
DC24V	Without	DS112NR	DS112MS
	With	DS112NR-IO	DS112MS-IO

**Connection example**



Ball Screw

Worm Gear

Direct Drive

- φ39
- φ40
- φ59
- φ60
- φ75
- φ100
- φ180
- Other

## Motorized Stage Unit Example

Can be made your own unit with our 2,000 kinds of variety stages.

Available to make your own units by combined requirement stages.

We show the sample of units in response to the scenes.

\*Please contact us for more details.

\*Price

Design or adjustment fee in the original unit will arise. Please refer.

- Linear and rotation centering
- Competition and interference
- Customized spacer or additional processing

Please feel free to ask us about units.

**TEL +81-3-6711-5014**  
**FAX +81-3-6711-5021**

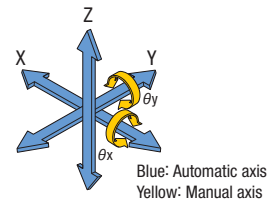
### Semiautomatic unit

Additional of the manual tilt mechanism can be contributed to flexibility in positioning.

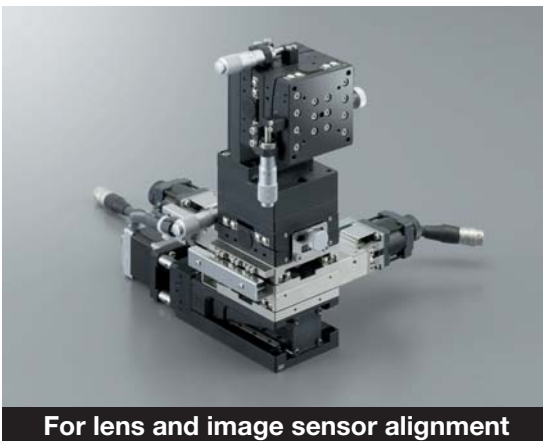


### 5-axis unit

Add the manual tilt stage for the 3-axis linear unit.

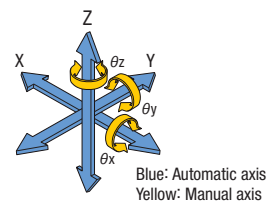


Axis	Model	Page
X	KWC06020-LC	▶P.1-089
Y		
Z		
$\theta_x$	B43-60N	▶P.2-171
$\theta_y$	B58-40UC	▶P.2-161



### 6-axis unit

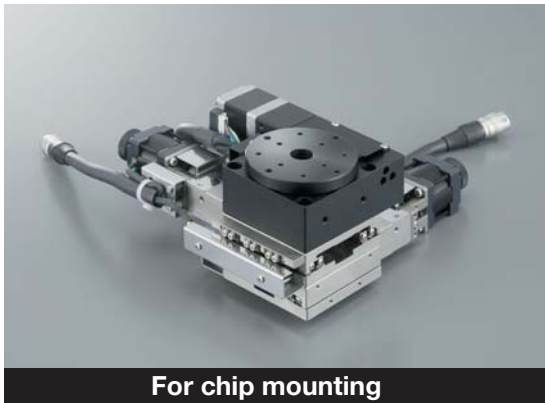
Add the manual tilt stage for the 3-axis linear unit.



Axis	Model	Page
X	PMG615 series	▶P.1-029
Y		
Z	KH0604-L	▶P.1-117
$\theta_x$	B58-60	▶P.2-165
$\theta_{yz}$	B59-60	

**Totally automatic**

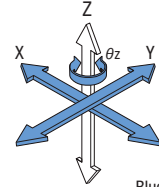
Various positioning unit are supported depending on your purpose.



**For chip mounting**

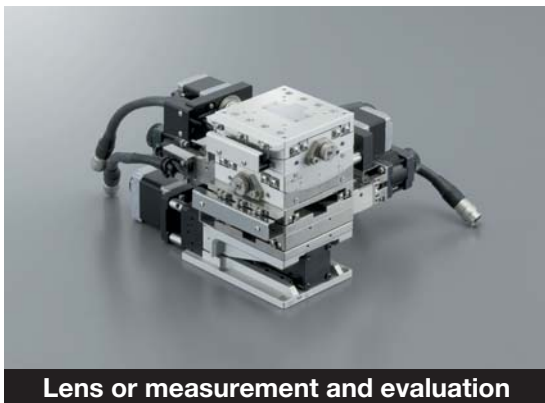
**3-axis unit**

Combined the newest stage into the rotation stage.



Blue: Automatic axis

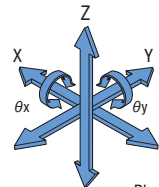
Axis	Model	Page
X	PMG615 series	▶P.1-029
Y		
$\theta$	KRB06011	▶P.1-170



**Lens or measurement and evaluation**

**5-axis unit**

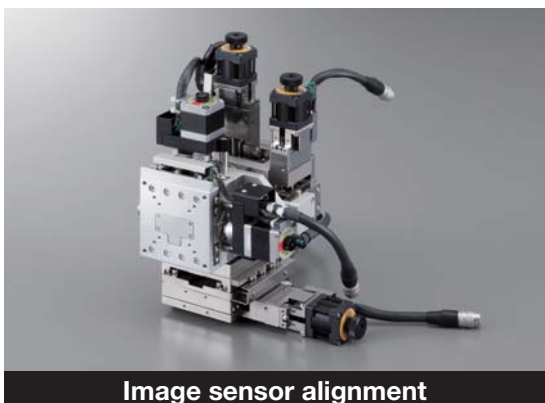
Combined the XY stage into thin-type horizontal Z stage and 2 goniometer stages.



Blue: Automatic axis

Axis	Model	Page
X	PMG715 series	▶P.1-029
Y		
Z	KH0704 series	▶P.1-117
$\theta_{xy}$	KAB07070AL	▶P.1-145

**Custom**

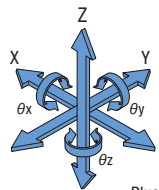


**Image sensor alignment**

**6-axis unit (High durability. Compact type)**

6-axis unit which all of -axis used by ball screws.

This is a high performance model combined into a single structure with an XYZ-axis and travel guide.



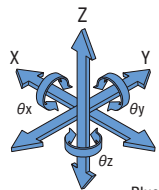
Blue: Automatic axis



**Assembly for camera module**

**6-axis unit (High rigidity)**

This high rigidity 6-axis unit that is configured ball screw goniometer stage and rotation stage.



Blue: Automatic axis

## Controller Guidance

### Stepping motor controller



- Stepping motor controller DS102/112 [▶ P.1-197~](#)
- Handy terminal DT100 [▶ P.1-199~](#)
- DS102/112 Control software  
DSCONTROL-WIN [▶ P.1-200~](#)
- Method for return to origin [▶ P.1-201~](#)
- Cable for DS102/112 [▶ P.1-208~](#)
- Cable for external control [▶ P.1-208~](#)

### Stepping motor driver



- Stepping motor driver [▶ P.1-205~](#)

### Cable



- Cable (Between stage and controller) [▶ P.1-207~](#)
- Cable for DS102/112 [▶ P.1-208~](#)
- Cable for external control [▶ P.1-208~](#)
- Cable connecting diagram [▶ P.1-209~](#)
- Motor option supplied cable [▶ P.1-211~](#)

### Motor list



- Motor list [▶ P.1-213~](#)

X

XY

Z

Horizontal  
plane Z

XYZ

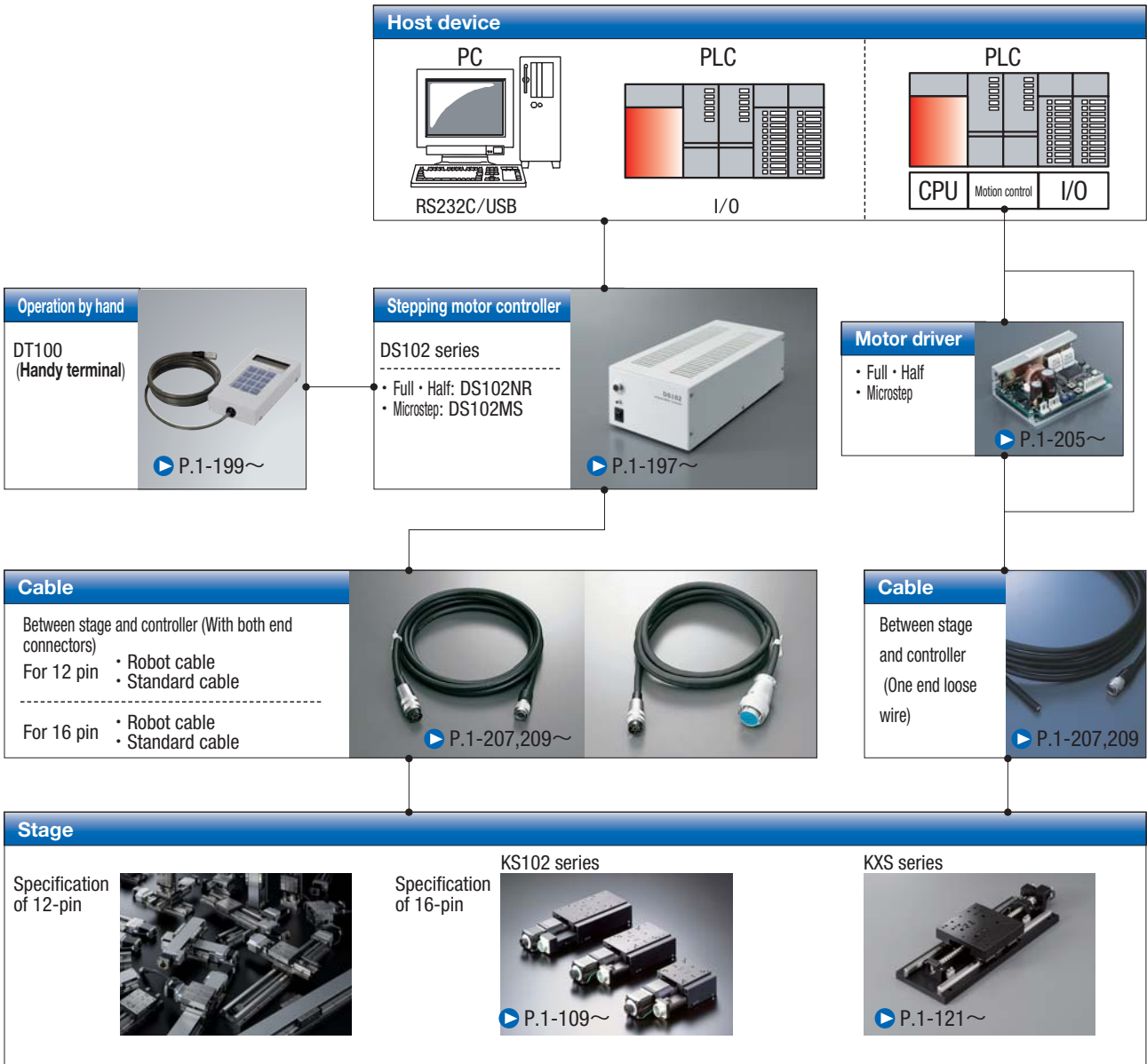
Goniometer

Rotary

Unit

Controller

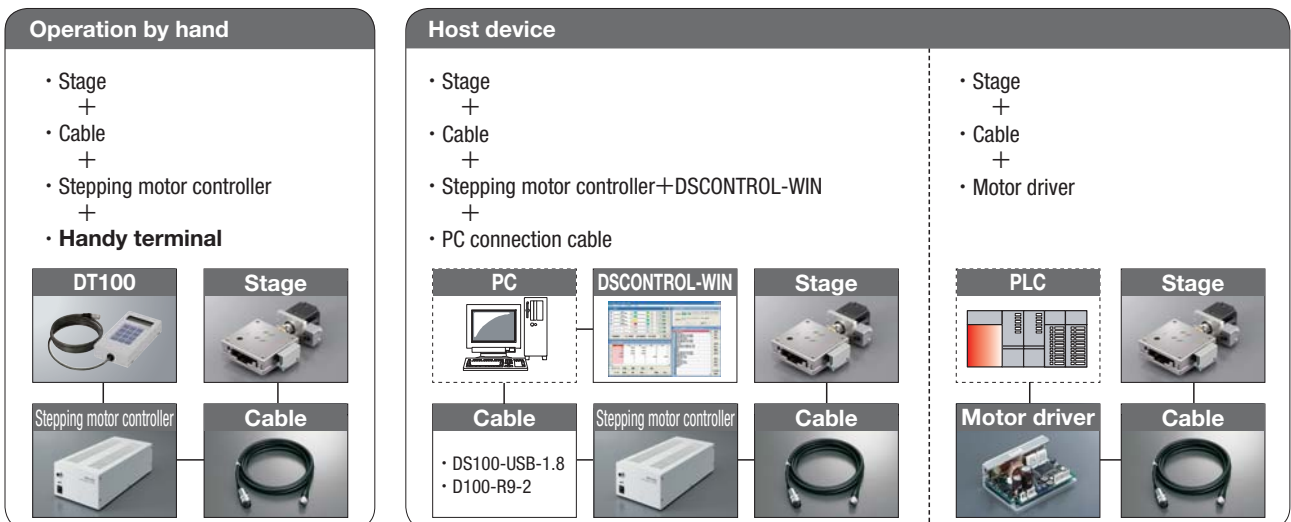
# Connection Example



Controller

- X
- XY
- Z
- Horizontal plane Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

# Configurations





## Stepping Motor Controller: DS102/112 Series

Instruction Manual

RoHS

Controller

DS102/112 series stepping motor controller has 2-axis driver for 5 phases stepping motor driving.

- Program and teaching function has developed positioning system without control PC.
- It is possible to control up to 6-axis with link function. Up to 24-axis can be controlled with USB Hub.
- Linear interpolatin of 2-axis.
- The standard input/output board for controlling internal equipments by using option models also available.
- Controlled command is compabitlle for D200 series

DS102 series



DS112 series

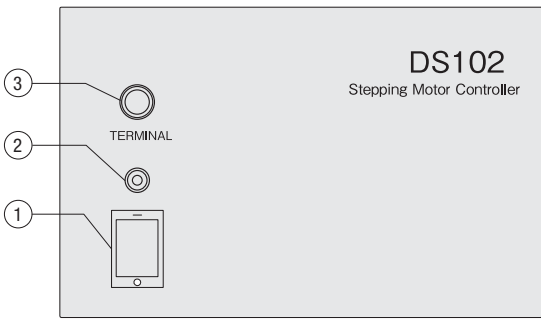


- ①: Please use our handy terminal DT100 and software DSCONTROL-WIN for programing and teaching set-up.
- ②: Control the stage with electromagnetic brake is custom-made.
- ③: Not available for PG series sensor voltage 24V.
- ④: The advance verification is required when use the program for D200series.

SPEC				
Model	DS102NR DS102MS	DS102NR-IO DS102MS-IO	DS112NR DS112MS	DS112NR-IO DS112MS-IO
Dimension	140 (W)×300 (D)×90 (H) mm		70 (W)×165 (D)×155 (H) mm	
Input power	AC100~240V±10%、50/60Hz		DC24V±10%	
Maxium power consumption	Less than 70W		Less than 2.5A	
Driver type (Divisions)	DS102NR: Normal (Full/Half) DS102MS: Micro step (1~1/250 [16 steps])		DS112NR: Normal (Full/Half) DS112MS: Micro step (1~1/250 [16 steps])	
Driver current rating	0.75A/Phase			
Number of controlled axis	2			
Coordinate setting range	±99,999,999pls			
Driving speed setting range	1~999,999pps			
Rate of rise speed setting range	1~9,999pps			
Addition-subtraction speed rate setting range	1~9,999ms			
Machine limit	2places for each axis to CW, CCW CW・Direction of CCW (Possible logic change)			
Detected proximity origin	1place for each axis(Possible logic change)			
Detected origin	1place for each axis(Possible logic change)			
How to detect origin	12 methods			
Sensor power	DC5V			
Home position	1place for each axis(Can be set up in effective area arbitrarily)			
External COM interface	RS232C : 4,800~38,400bps [D-SUB9Pin male] USB2.0 : Full/Low Speed Only [USB mini B connector] Control I/O: Input 9 points(24V photo coupler), output 12 points (open collector)			
Link function	RS485(Contrable max 6-axis in DG chain)			
Programing function	8 programs (100 steps/per program, Start/finish on control I/O)			
Teaching function	64 points (positioning in control I/O)			
Interpolation function	6-axis linear interpolation(between link device is easy linear interpolation)			
Universal input and output	—	Input 16 points(24V photo coupler) Output 12 points(Open collector)	—	Input 16 points(24V photo coupler) Output 12 points(Open collector)
Accessories	1 power cable and CD-ROM(USB driver)			
Weight	2.2kg		1.2kg	

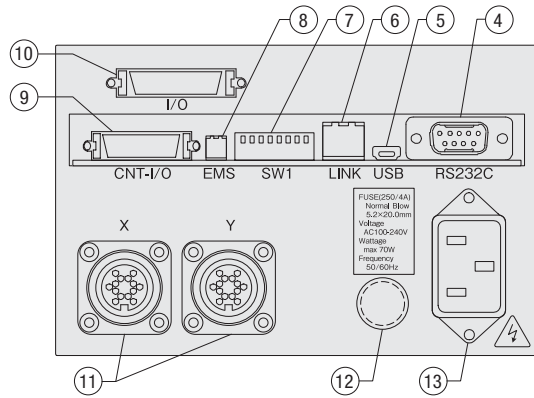
**DS102 panel layout**

**Front panel**



- ① Power switch
- ② POWER LED
- ③ TERMINAL \*1

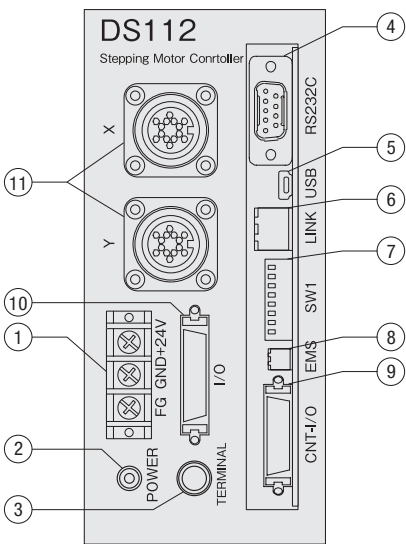
**Rear panel**



- ④ RS232C \*2
- ⑤ USB connector \*3
- ⑥ LINK connector
- ⑦ DIP switch \*4
- ⑧ EMS connector \*5
- ⑨ I/O connector for control \*6
- ⑩ General I/O connector \*7
- ⑪ Stage motor connector \*8
- ⑫ Fuse holder
- ⑬ AC inlet

**DS112 panel layout**

**Front panel**



- ① Terminals for power input
- ② POWER LED
- ③ TERMINAL \*1
- ④ RS232C connector \*2
- ⑤ USB connector \*3
- ⑥ LINK connector
- ⑦ DIP switch \*4
- ⑧ EMS connector \*5
- ⑨ I/O connector for control \*6
- ⑩ General I/O connector \*7
- ⑪ Stage motor connector \*8

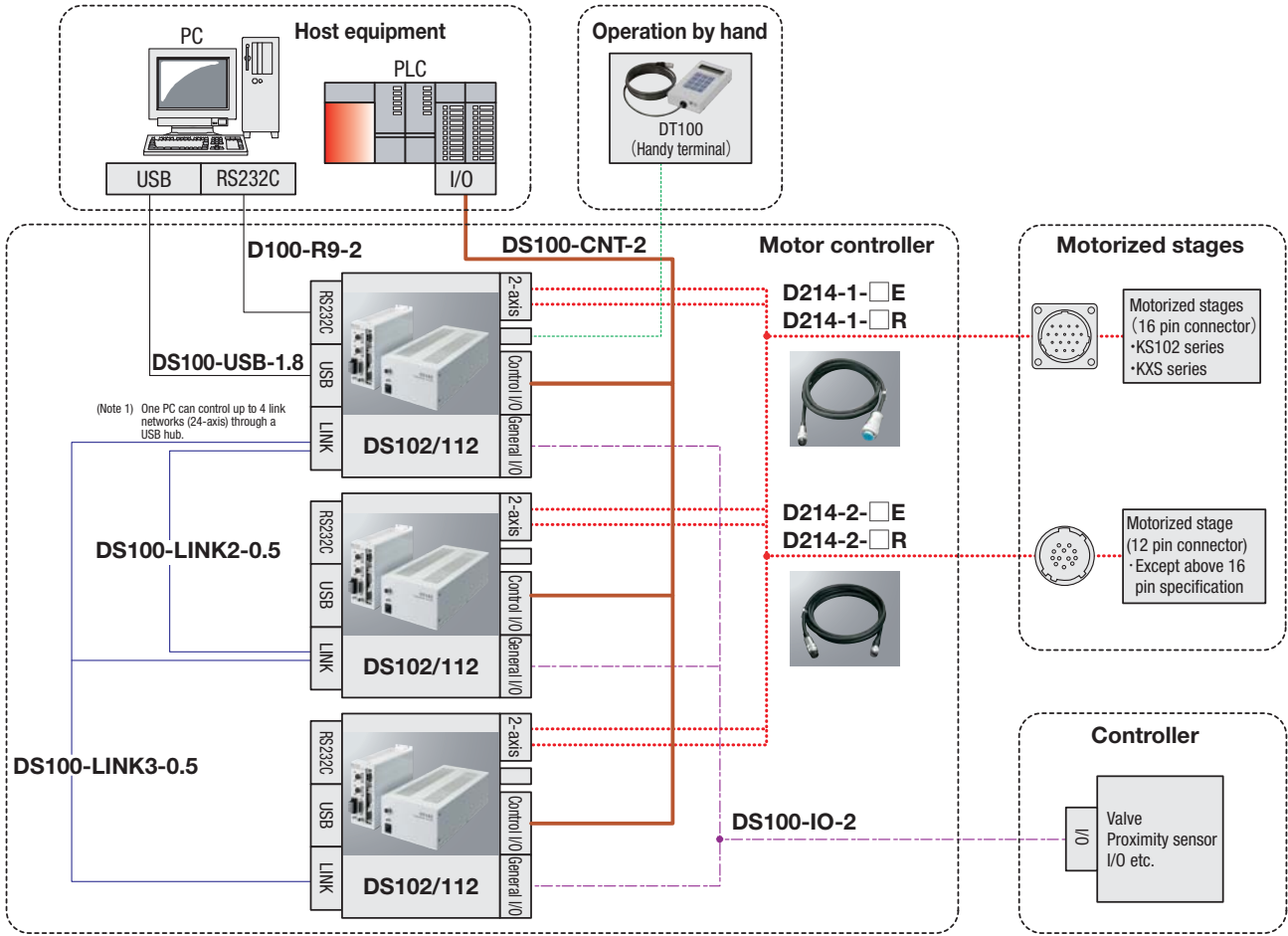
**Specifications (Applicable for DS102/112)**

- \*1: DT100 Connector for DT100 handy terminal
- \*2: Dsub9P male
- \*3: Mini-B type
- \*4: RS232C baud rate (2bit), Link (2bit), USB ID (2bit) Set a command response (1bit)
- \*5: Model type S02B—PASK-2(LF)(SN) (Manufactured by JST)
- \*6: Model type 10226-52A2PL (Manufactured by 3M)
- \*7: Model type 10236-0200 (Manufactured by 3M)  
 [Only DS102□□-I/O, DS112□□-I/O]
- \*8: Model type 09-0054-00-14 (Manufactured by Binder)

\* Please refer the instruction manual about mounting from our web site.

## Connection integration example

### When use our recommendation stepping motor controller (DS102/112)



## Handy Terminal: DT100

RoHS

Can be operated remotely with DT100.

Can be operated continuous driving, step driving, return to origin, program execution and teaching by hand with DT100.

The display is a 16 digit × 2 line LCD.

⚠ It may not be possible to create or edit on DT100. Available only for program number selection, setting and stop. DSCONTROL-WIN for programing is recommended.



SPEC	
Model	DT100
Display	LCD
Input power	DC24V (from main body)
Number of keys	12 keys
Cable length	1.5m
Dimensions	73 (W) × 130 (D) × 27 (H) mm
Weight	280g

# DS102/112 Control software: DSCONTROL-WIN

DSCONTROL-WIN is the DS102/112 control software used to easily set and control the DS102/DS112 stepping motor controller connected by USB or RS232C on Microsoft Windows. Available maximum 6-axis.



\*Sample display

## Main function

- Set the parameter for each axis.
- Manual driving (continuous driving, step driving, Absolute value driving, return to origin)
- Teaching function
- Edit, upload and download of internal programs.
- Monitoring and forced output function of general I/O port

SPEC	
Model	DSCONTROL-WIN
Number of controlled axis	6-axis
Applicable interface	USB/RS232C
Applicable OS	Microsoft® Windows 2000/XP/7

\*This software cannot be operated plural start-up at the same time.

## Stage controller sample program

Required to make a program when controll our stage controller from your PC.  
Available free sample program from our web site.

<http://eng.surugaseiki.com/>



\*Sample display

You do not need to follow our sample program.  
The final control program should be organized by yourself.  
No guarantee of the motion in all environment.

## Method for Return to Origin

Suruga's motorized stages is different from the sensor specifications depends on models. As return to origin operation is divided into types, it is necessary to choose the correct type. Selected wrong type may be operated incorrectly. Choose your best one whatever you need according to be recommended as below.

### Recommended return to origin

Sensor	Models	Return to origin type
1	KRW04/06,KRE	3,4,9,10
2	KXL,KRB,KRB04/06(An additional specification of KXL origin sensor option becomes a return to origin type 3, 4, 9 and 10.)	5,6,11,12
3	KXG,PG*,KXC,KS101,KX*07/08/10/12,KH*,KS332*,KGB*,KG05/07,KS402,KGW,KXT,KHE	3,4,9,10
4	KXS,KS102	1,2,7,8

(\*) means sensor mounted stages. Please purchase the cable for 4 sensors separately. Return to origin type becomes 1, 2, 7, and 8.

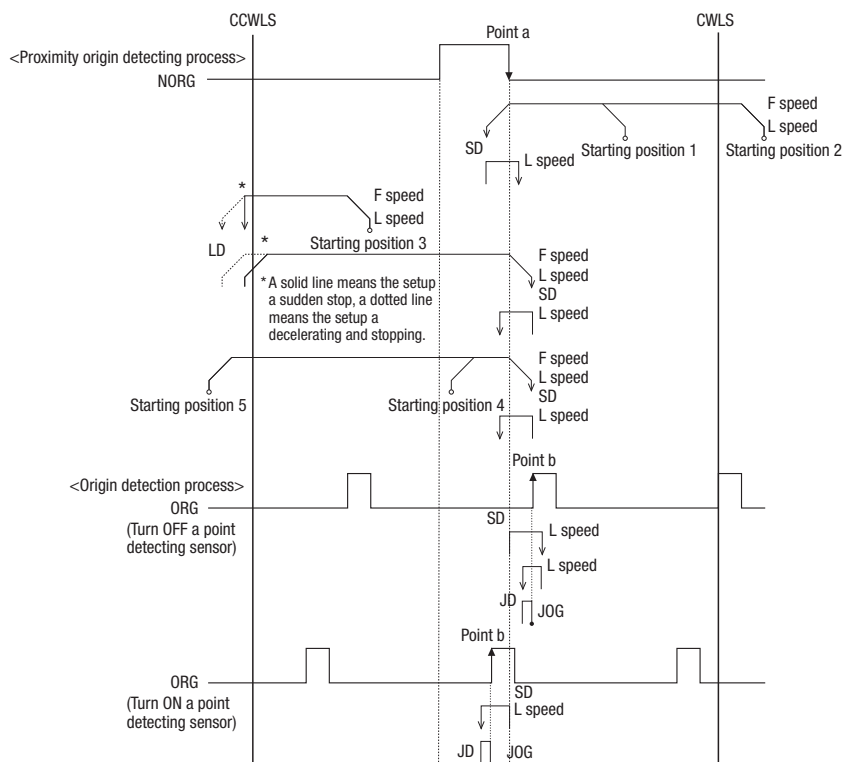
### The return to origin type list

Type	Motion
Type 0	No return to origin is performed
Type 1	Detect in the direction of CCW and perform detected process for CW edge(point a) of NORG signal.Next detect an edge of CCW side(point b) of ORG signal.
Type 2	Detect in the direction of CW and perform detected process for CCW edge of NORG signal.Next detect on edge of CW side (point b) of ORG signal.
Type 3	Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
Type 4	Detect in the direction of CW and perform detected process for CW edge of ORG signal.
Type 5	Detect in the direction of CCW and perform detected process for CW edge of CWLS signal.
Type 6	Detect in the direction of CW and perform detected process for CCW edge of CWLS signal.
Type 7	After finished type1, perform detected process for CCW edge of TIMING signal.
Type 8	After finished type2, perform detected process for CW edge of TIMING signal.
Type 9	After finished Type3, perform detected process for CCW edge of TIMING signal.
Type 10	After finished Type4, perform detected process for CW edge of TIMING signal.
Type 11	After finished type5, perform detected process for CCW edge of TIMING signal.
Type 12	After finished type6, perform detected process for CW edge of TIMING signal.

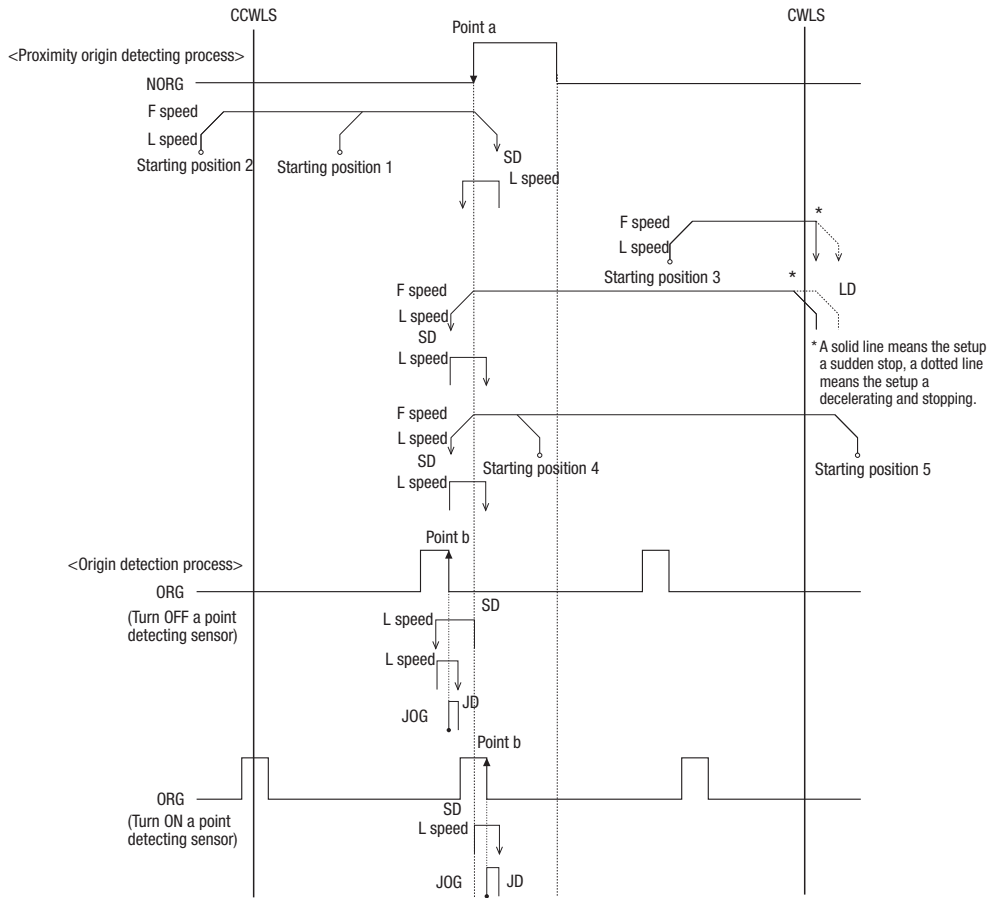
Return to origin sequence shows as below.

**[Type 0]** No return to origin is performed

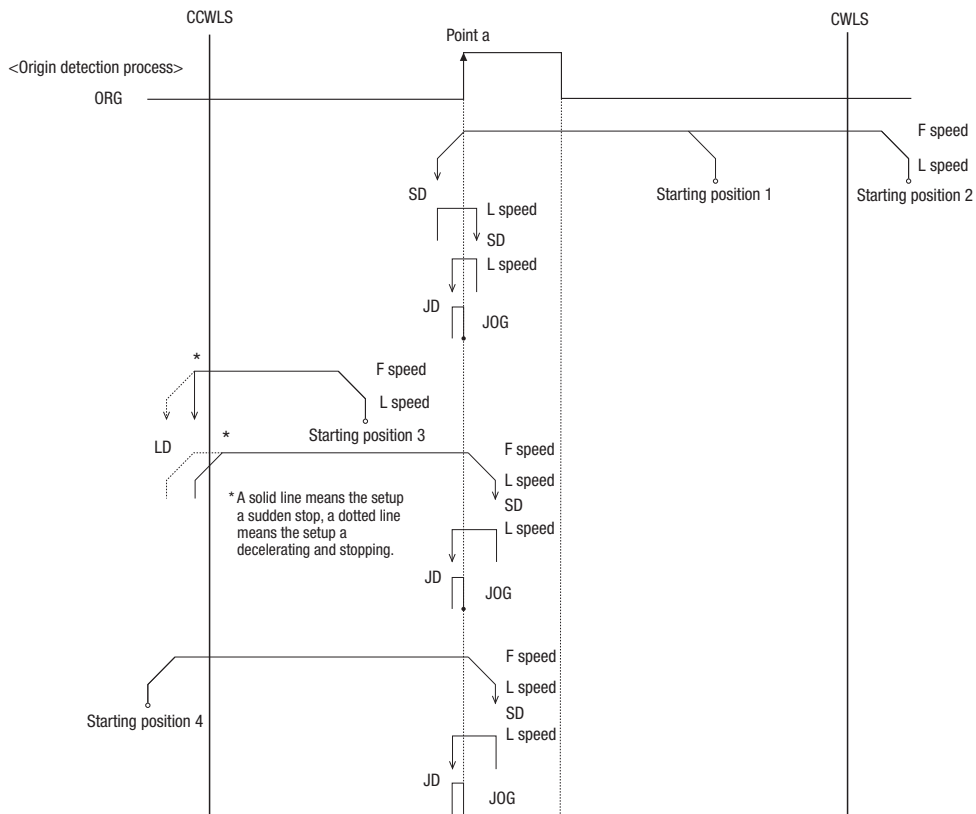
**[Type 1]** Detect in the direction of CCW and perform detected process for CW edge(point a) of NORG signal.



**[Type 2]** Detect in the direction of CW and perform detected process for CCW edge(point a) of NORG signal.Next detect on edge of CW side (point b) of ORG signal.



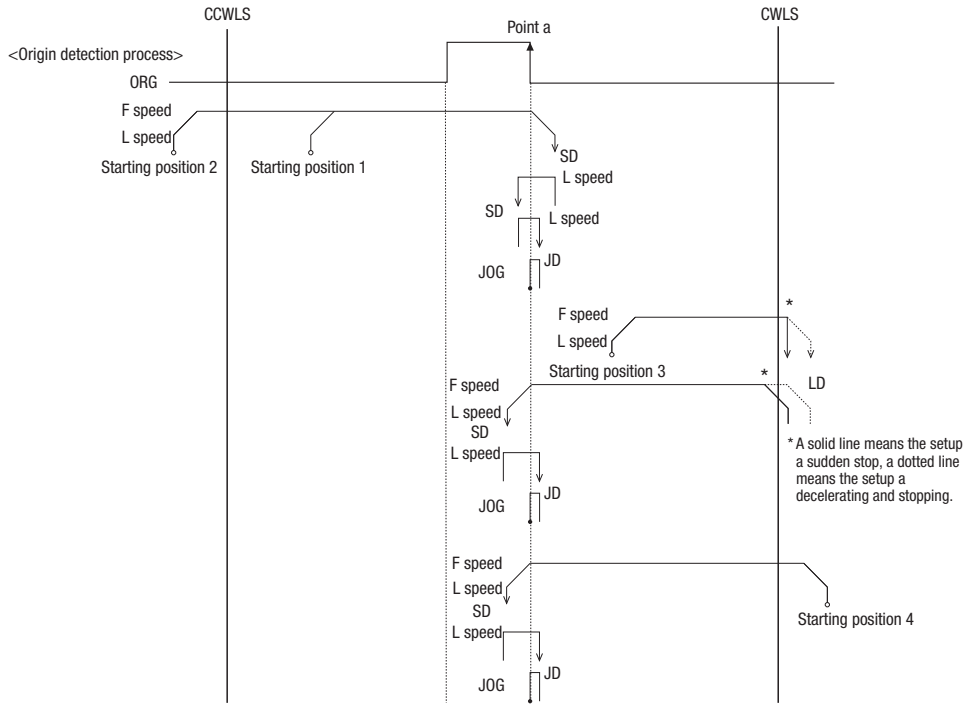
**[Type 3]** Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.



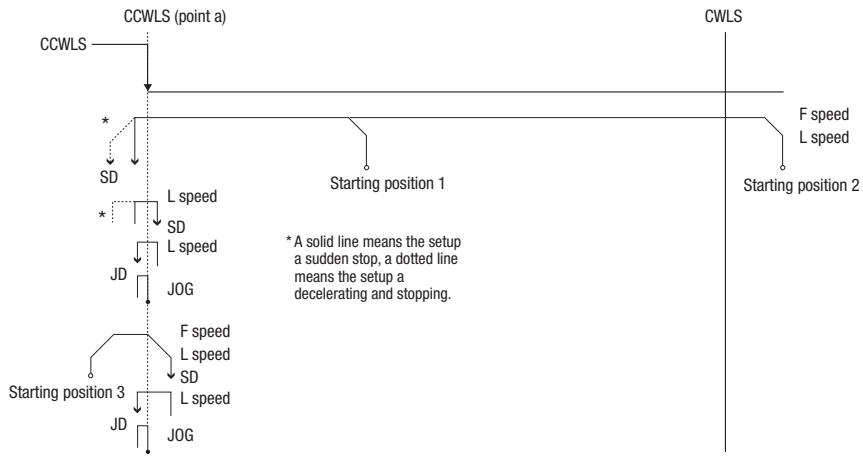
## Method for Return to Origin

Controller

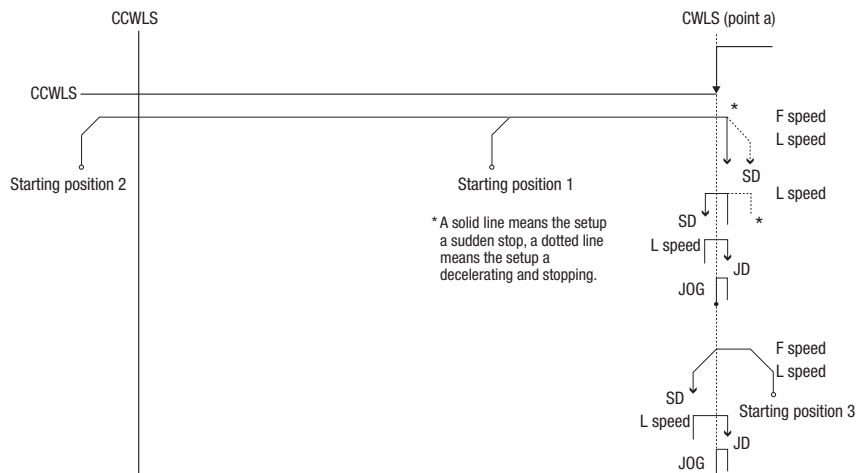
**[Type 4]** Detect in the direction of CW and perform detected process for CW edge of ORG signal.



**[Type 5]** Detect in the direction of CCW and perform detected process for CW edge(point a) of CWLS signal.

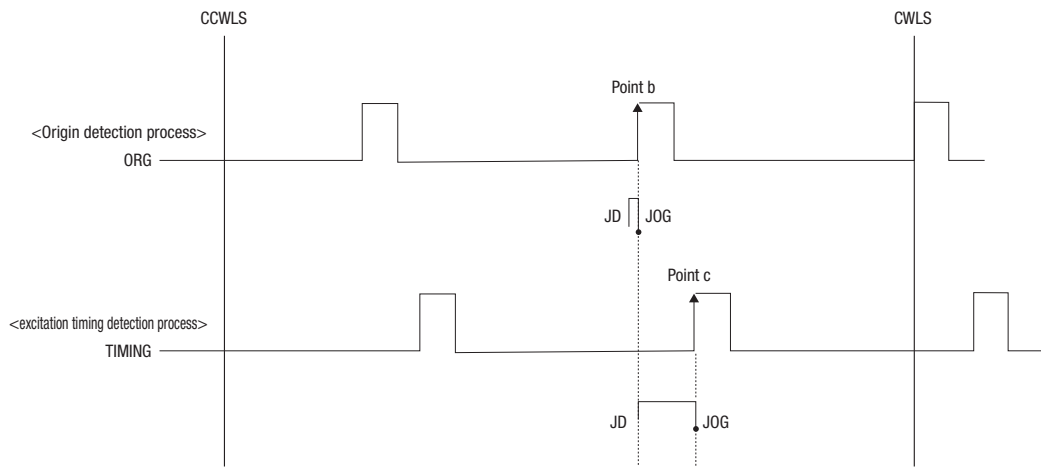


**[Type 6]** Detect in the direction of CW and perform detected process for CCW edge (point a) of CWLS signal.

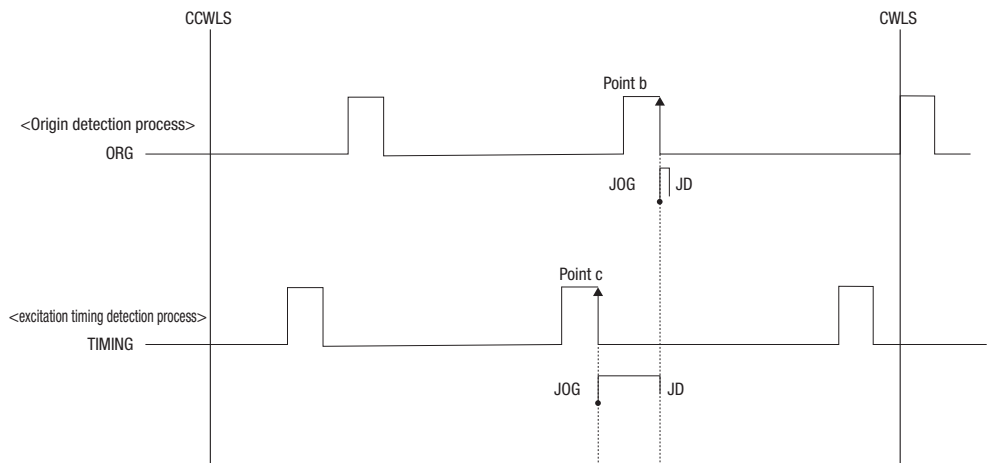


- X
- XY
- Z
- Horizontal plane Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

**[Type 7]** After finished type1, perform detected process for CCW edge(point c) of TIMING signal.



**[Type 8]** After finished type2, perform detected process for CW edge(point c) of TIMING signal.



**[Type 9]** After finished Type3, perform detected process for CCW edge of TIMING signal.

**[Type 10]** After finished Type4, perform detected process for CW edge of TIMING signal.

**[Type 11]** After finished type5, perform detected process for CCW edge of TIMING signal.

**[Type 12]** After finished type6, perform detected process for CW edge of TIMING signal.

**In case of return to origin with TIMING signal (Type7~Type12).**

When the excitation condition of stepping motor is the excitation origin by stated in driver.  
 TIMING output becomes ON for each 7.2degree when the motor's step angle is 0.72degree.  
 The AND circuit that is configured with stage origin sensor and TIMING output can be detected to improving the accuracy of the origin without motor stop position variation in the origin sensor.

○	Detection start position
●	Detection finishing position
F speed	Driving speed(setting speed)
L Speed	Start speed(setting speed)
JD (JOG)	Interval detection JOG(JD=Lspeed)
LD	Stop time of limit detectio 300msec
SD	Stop time of sensor detectio 300msec



When the motorized stage is driven with the motion control board and the positioning unit, we recommend following drivers. CRD5107P has smooth driver function that is realized vibration reduction and low noise.

Controller

### DC24V type input driver



DFC5107P

#### What is smooth drive function?

Micro step can be driven without changing setup in controller as necessary.

\*The photo shows an image.

SPEC							
Model	CRD5107P		SD5107P3-A22			DFC5107P	
Compatible motor	PK525HPB-C15 PK525HPB-C17	C7214-9015-1 PK523HPMB	C9582-9015-1 PK523HPMB-C1	C005C-90215P PK546PB	C005C-90215P-1 PK523-HPB-C17	PK544-NB-C16 Motor for KS451-40(Customized)	PK525HPB
Input power	DC24V±10% 1.4A (Max)				DC24V-36V±10% 1A (Max)		
Rated current				0.75A/Phase			
Divisions	1~1/250			Full/Half		1~1/250	
Range of operating temperature				0~40°C			
Dimension	65 (W) ×45 (D) ×28 (H) mm				100 (W) ×70 (D) ×36 (H) mm		
Weight	0.04kg				0.2kg		
Input signal	Photo coupler input						

### Cable for DC24V input driver

600mm connector is crimped to a driver connector. A three-piece set of cable between driver and DC power, a motor and host controller Ready for use because if east insert to the driver directly.

No need a crimping work and crimping tools, also avoid a damage of the driver due to miswiring.

(The connector assembly and wiring that included DC24 type driver required the specialized crimping tools).

SPEC		
Model	LCS04SD5	LCS02CFK
Compatible driver	CRD5107P/SD5107P3-A22	DFC5107P
Length	600mm	

### AC100V type input driver



SPEC							
Model	RKD507-A						
Compatible motor	PK525HPB-C15 PK525HPB-C17	C7214-9015-1 PK523HPMB	C9582-9015-1 PK523HPMB-C1	C005C-90215P PK546PB	C005C-90215P-1 PK523-HPB-C17	PK544-NB-C16 Motor for KS451-40(Special Limited)	PK525HPB
Kinds	Standard driver						
Input power	Single phase 100V-115V ±15% 50/60Hz 1A (Max)						
Rated current	0.75A/Phase						
Divisions	1~1/250						
Range of operating temperature	0~50°C						
Dimension	45 (W) ×90 (D) ×120 (H) mm						
Weight	0.4kg						
Input signal	Photo coupler input						

# Stepping Motor Driver



This case type driver (Manufactured by Techno Drive Co.,Ltd.) can be connected easily.

## DC24V type input driver



KR-A5MC



KR-A55MC

SPEC	
Model	KR-A5MC
Compatible motor	PK525HPB-C15 C7214-9015-1 C9582-9015-1 PK544-NB-C16 C005C-90215P C005C-90215P-1 PK525HPB PK525HPB-C17 PK523HPMB PK523HPMB-C1 PK546PB PK523-HPB-C17 Motor for KS451-40(special limited)
Input power	DC20V—35V
Rated current	0.75A/Phase
Divisions	Full/Half 1~1/250
Range of operating temperature	0~40°C
Dimension	93 (W) ×45 (D) ×32 (H) mm 105 (W) ×76.5 (D) ×39.5 (H) mm
Weight	0.13kg 0.22kg
Input signal	Photo coupler input

## AC100V type input driver



KR-A535M

SPEC	
Model	KR-A535M
Compatible motor	PK525HPB-C15 C7214-9015-1 C9582-9015-1 PK544-NB-C16 C005C-90215P C005C-90215P-1 PK525HPB PK525HPB-C17 PK523HPMB PK523HPMB-C1 PK546PB PK523-HPB-C17 Motor for KS451-40(special limited)
Type	Standard driver
Input power	Single phase 100V—220V ±10% 50/60Hz
Rated current	0.75A/Phase
Divisions	1~1/250
Range of operating temperature	0~50°C
Dimension	42 (W) ×170 (D) ×134.3 (H) mm
Weight	0.66kg
Input signal	Photo coupler input

Controller

X

XY

Z

Horizontal plane Z

XYZ

Goniometer

Rotary

Unit

Controller

The connection cable between a motorized stage and a stepping motor controller. There is the standard 2m cable and following cables.

- 2~6m cable(in 2m increments)
- One end loose cable(Loose wire on controller side)
- Robot cable

Selectable from the following cables when you purchase the motorized stage. Must be checked for cable type in code table on the page of each product.

D214-1-2E



D214-2-2E



Loose wire on controller side



☛ Choose the connector that is either end of the connection type for using DS102/112.

### Normal cable/minimum bending radius:R33mm

Model	D214-1-2E	D214-1-4E	D214-1-6E	D214-1-2EK	D214-1-4EK	D214-1-6EK	D214-2-2E	D214-2-4E	D214-2-6E	D214-2-2EK	D214-2-4EK	D214-2-6EK
Existence of connector	With both end connectors			One end (controller side) loose wire			With both end connectors			One end (controller side) loose wire		
Connector on controller side	09-0341-02-14 (Binder)			—			09-0341-02-14 (Binder)			—		
Stage-side connector	SRCN6A21-16S (JAE)						HR10A-10P-12S (73) (HRS)					
Cable length	2m	4m	6m	2m	4m	6m	2m	4m	6m	2m	4m	6m
Color of insulator												

### Robot cable / Minimum bending radius:R33mm Excellent performance in bending

Model	D214-1-2R	D214-1-4R	D214-1-6R	D214-1-2RK	D214-1-4RK	D214-1-6RK	D214-2-2R	D214-2-4R	D214-2-6R	D214-2-2RK	D214-2-4RK	D214-2-6RK
Existence of connector	With both end connectors			One end (controller side) loose wire			With both end connectors			One end (controller side) loose wire		
Connector on controller side	09-0341-02-14 (Binder)			—			09-0341-02-14 (Binder)			—		
Stage-side connector	SRCN6A21-16S (JAE)						HR10A-10P-12S (73) (HRS)					
Cable length	2m	4m	6m	2m	4m	6m	2m	4m	6m	2m	4m	6m
Color of insulator												

### Cable for 4 sensors / Minimum bending radius:R33mm

Model	D214-2-2EA	D214-2-4EA	D214-2-6EA	D214-2-2EAK	D214-2-4EAK	D214-2-6EAK	D214-2-2RA	D214-2-4RA	D214-2-6RA	D214-2-2RAK	D214-2-4RAK	D214-2-6RAK
Existence of connector	With both end connectors			One end (controller side) loose wire			With both end connectors			One end (controller side) loose wire		
Connector on controller side	09-0341-02-14 (Binder)			—			09-0341-02-14 (Binder)			—		
Stage-side connector	HR10A-10P-12S (73) (HRS)						HR10A-10P-12S (73) (HRS)					
Cable length	2m	4m	6m	2m	4m	6m	2m	4m	6m	2m	4m	6m
Color of insulator	[Standard cable]						[Robot cable]					

### Multi-core cables common specification

Type	Standard cable	Robot cable
Conductor	Configuration	40pieces/0.08mm [24AWG]
	Approximate external diameter	0.65mm
Insulator	material	PVC
	Color	Refer to the cross section
Sheath	material	PVC
	Color	Black
Finishing external diameter	6.70±0.15mm	
Minimum bending radius	R33mm	

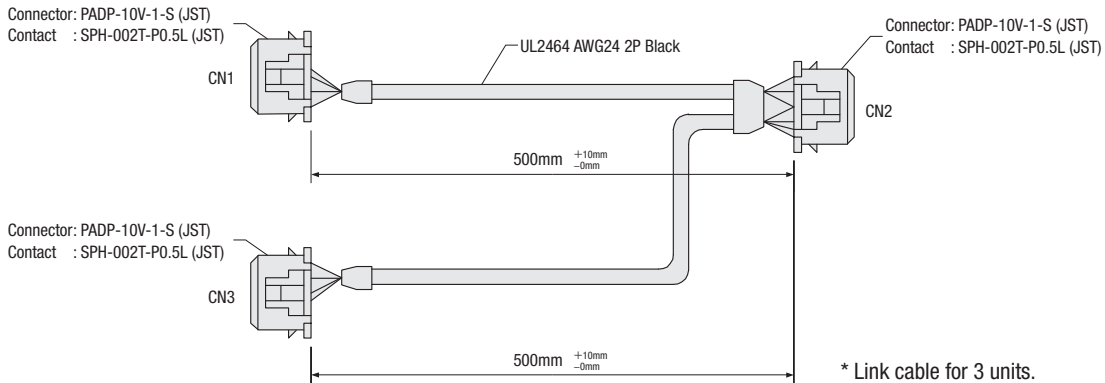
# DS102/112 Dedicated cable

RoHS

## ●Link cable DS100-LINK□-0.5

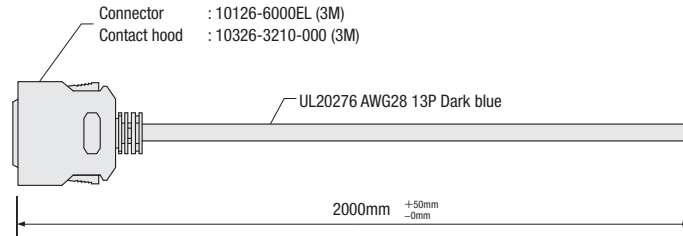
Use for control 4 or 6-axis with linking DS102/112

Select the cable DS100-LINK2-0.5 when will be linked two of DS102/112, and DS100-LINK3-0.5 for linking three of them.



## ●Control I/O cable DS100-CNT-2

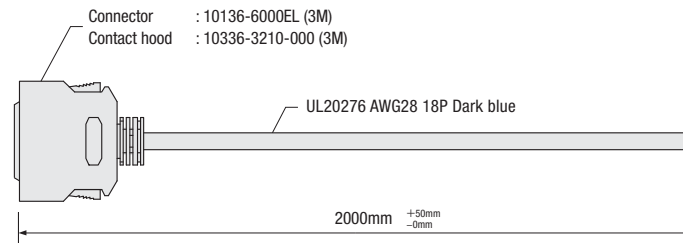
Use this cable if DS102/112 is operated I/O control in upper controller. Loose wire on one side.



\* Refer the user's manual for support wiring color information.

## ●Universal input and output DS100-IO-2

Connect the external equipment to DS102/112 for controlling. Loose wire on one side.



\* Refer the user's manual for support wiring color information.

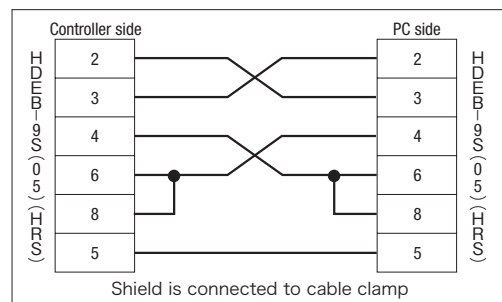
	SPEC			
Model	DS100-LINK2-0.5	DS100-LINK3-0.5	DS100-CNT-2	DS100-IO-2
Cable length	0.5m	0.5m	2.0m	2.0m
Remarks	For linking 2 units	For linking 3 units	For control I/O (One end loose wire)	For general I/O (One end loose wire)

# External control cable

There are cables for external control: cables for USB and RS232C.

	SPEC	
Model	DS100-USB-1.8	D100-R9-2
interface	USB	RS232C
Applicable controller	DS102/DS112	DS102/DS112
PC side Connector	USB USB A terminal socket	D-sub 9P Female
Cable length	1.8m	2m

## ■RS232C cable: D100-R9-2



Controller

X

XY

Z

Horizontal plane Z

XYZ

Goniometer

Rotary

Unit

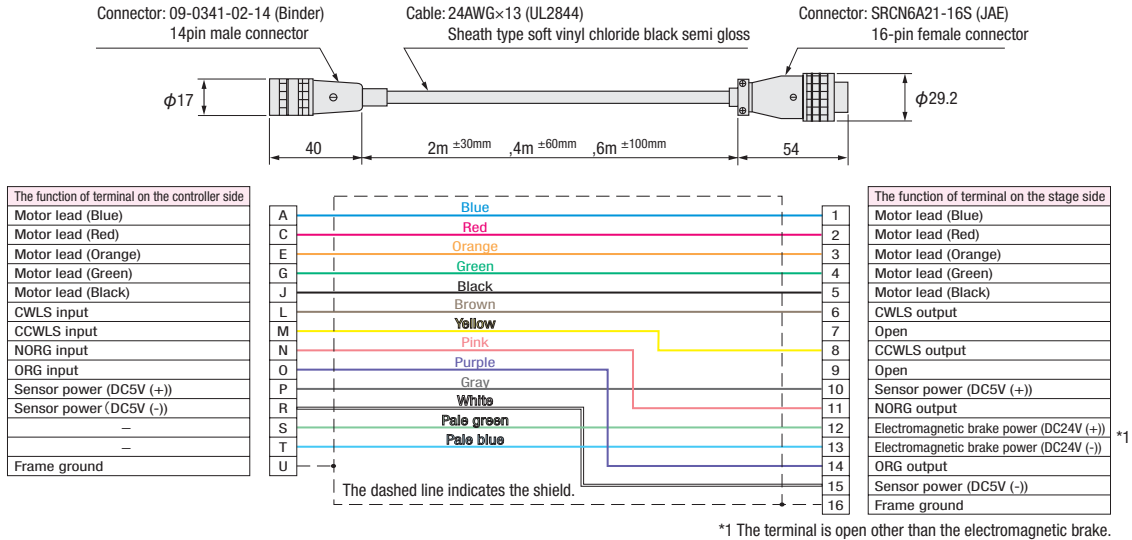
Controller

## Cable Connection Diagram

### Standard cable

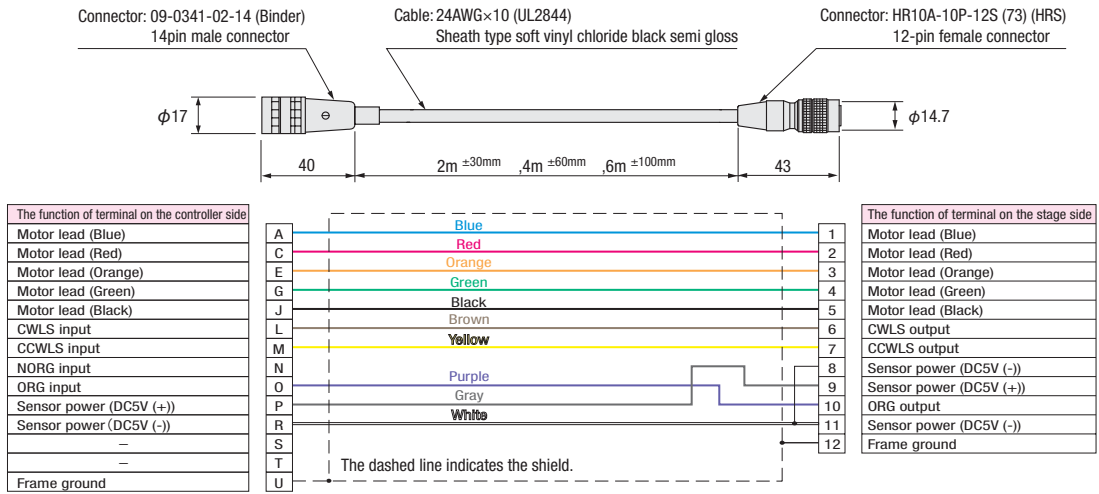
#### ● D214-1-2E (K) 、 D214-1-4E (K) 、 D214-1-6E (K)

\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



#### ● D214-2-2E (K) 、 D214-2-4E (K) 、 D214-2-6E (K)

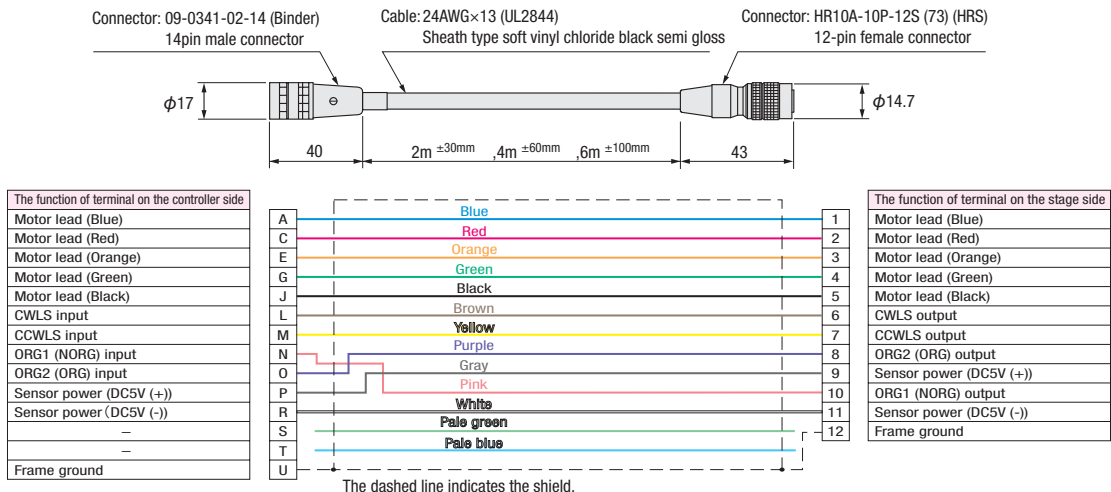
\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



### ■ Cable for slit origin sensor(ORG2)(For PG,KX07/08/10/12,KH,KG05/07 series)

#### ● D214-2-2EA (K) 、 D214-2-4EA (K) 、 D214-2-6EA (K)

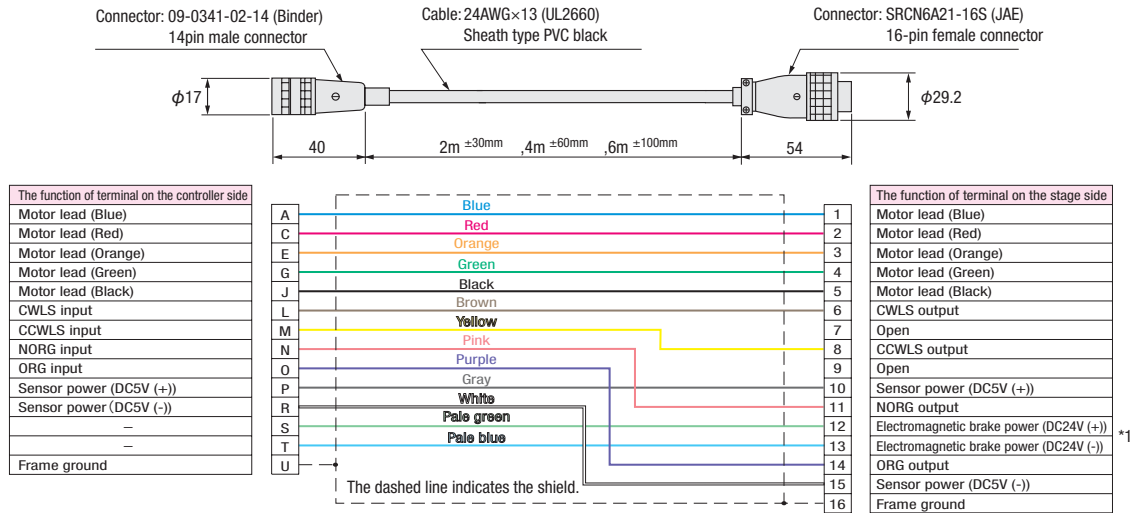
\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



## Robot cable

### ●D214-1-2R (K) 、 D214-1-4R (K) 、 D214-1-6R (K)

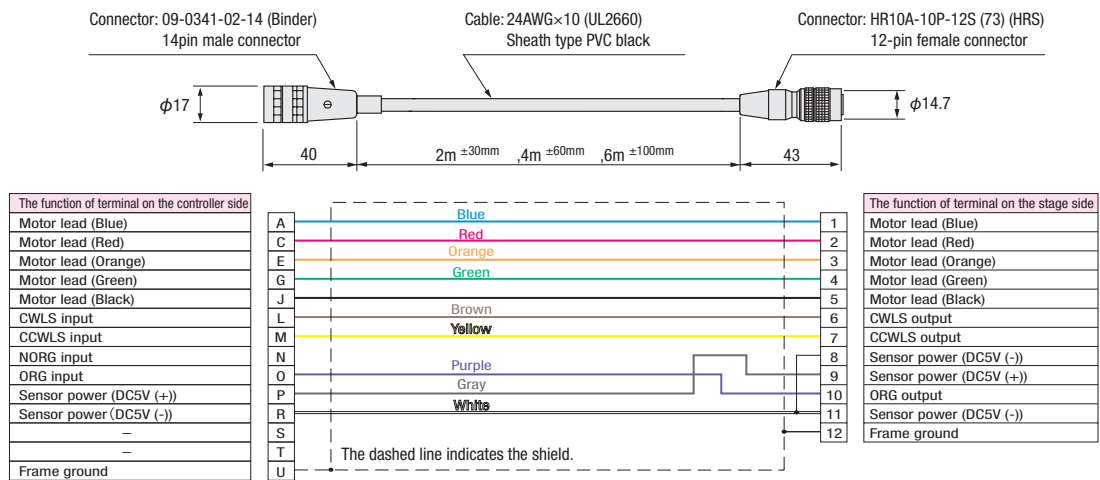
\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



\*1 The terminal is open other than the electromagnetic brake.

### ●D214-2-2R (K) 、 D214-2-4R (K) 、 D214-2-6R (K)

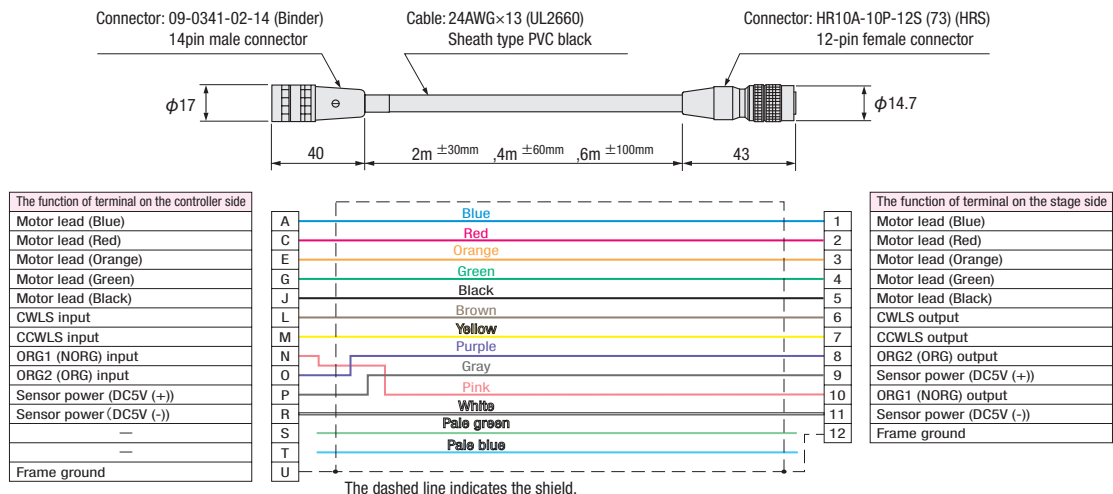
\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



### ■Cable for slit origin sensor(ORG2) (For PG,KX07/08/10/12,KH,KG05/07)

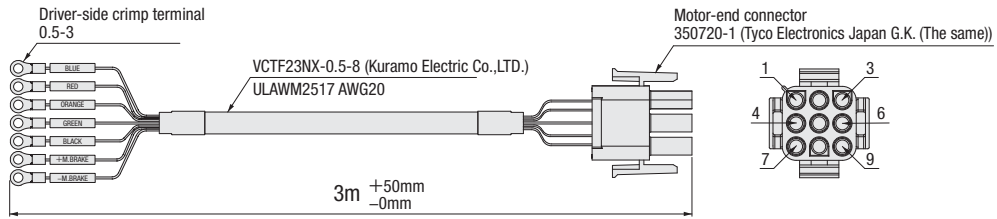
### ●D214-2-2RA (K) 、 D214-2-4RA (K) 、 D214-2-6RA (K)

\* The one end loose cable (tailing K) has loose wire in side of 14 pin male connector (controller).



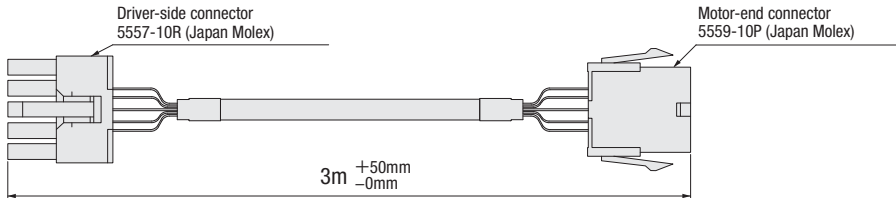
## Motorized Stage Optionally Supplied Cable (for Motor)

### ● Motor cable with electromagnetic brake (Fixed) STPO-RK2-A-3



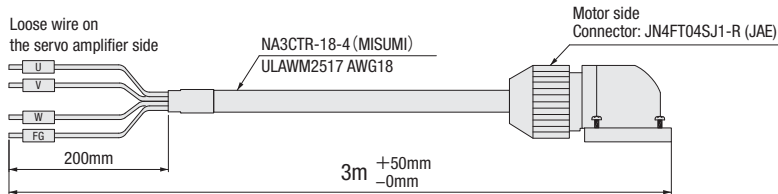
Mark	Color	Pin	Signals
BLUE	Blue	1	Motor lead Blue
RED	Red	2	Motor lead Red
ORANGE	Yellow	3	Motor lead Orange
GREEN	Green	4	Motor lead Green
BLACK	Black	5	Motor lead Black
+M.BRAKE	Brown	8	Motor brake (+)
-M.BRAKE	White	9	Motor brake (-)

### ● α Step motor cable (Movable) STPO-AS1-B-3



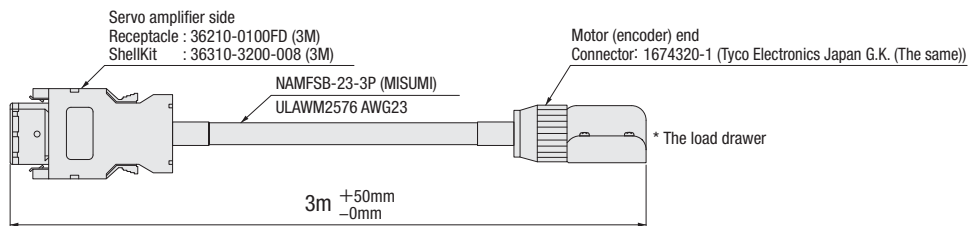
Pin	Color	Pin
1	White	1
2	Purple	2
3	Red	3
4	Blue	4
—	Black	—
6	Brown	6
7	Green	7
8	Yellow	8
9	Yellow	9
10	Shield	10

### ● Servo motor cable (Movable) SVPM-J3HF1-B-3-02S



Mark	Color	Pin	Signals
FG	Green / Yellow	1	FG
U	Red	2	U Phase
V	White	3	V Phase
W	Blue	4	W Phase

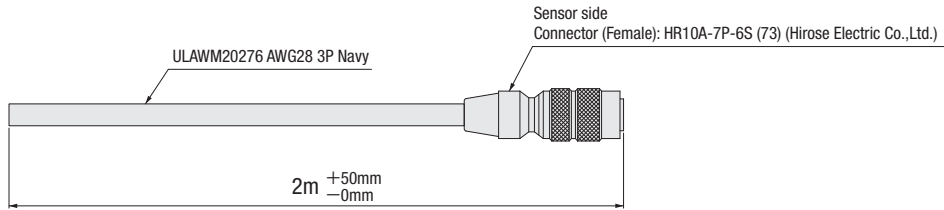
### ● Servo motor cable (Movable) SVEM-J3HF1-B-3



Signals	Pin	Color	Pin	Signals
P5	1	White	3	P5
LG	2	Black	6	LG
MRR	3	Red	5	MRR
MRR	4	Black	4	MRR
BAT	9	Green	2	BAT
SD	Plate	Shield	9	SD

## Motorized Stage Optionally Supplied Cable (for Sensor)

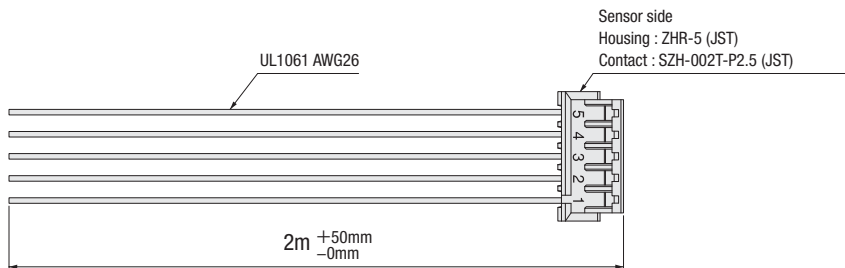
### ●CAVE-X/KXCSensor cable for motor option (Fixed) HR10AP-S-A-6-2



Color	Pin	Signals
Orange/Black	1	CWLS
Orange/Red	2	CCWLS
Gray/Black	3	ORG
Gray/Red	4	NORG
White/Black	5	V+
White/Red	6	V-
Shield		

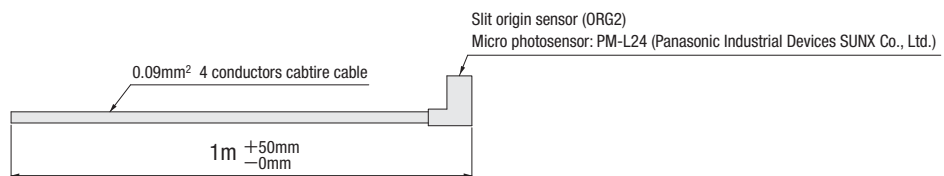
\*The shields are connected with the connector shell.

### ●Limit sensor cable for PG series (Fixed) PG-H-ASSY5-2000



Color	Pin	Signals
Brown	1	V+
Blue	2	V-
Black	3	CCWLS
Yellow	4	ORG1
White	5	CWLS

### ●Slit origin sensor for PG series (Micro photosensor) (Fixed) PM-L24



Color	Signals
Brown	V+
Blue	V-
Black	ORG2 (OUT1)
White	ORG2 (OUT2)

ⓘ Motor option supplied cable not available to purchase separately.

▶ See page P.1-037 for PG series motor

▶ See page P.1-051 for CAVE-X motor

▶ See page P.1-077 for KXL



## Motor List

Motorized stages are provided with 5-lead pentagon connection stepping motor. See the table below for specifications of motor types.

### No electromagnetic brake(Oriental motor)

Motor model	PK523HPB-C15	C005C-90215P-1	C005C-90215P	C7214-9015-1 C9582-9015-1	PK544-NB-C16
Phases	5 phase				
Rated current	0.75A/Phase				
Size	□28mm	□28mm	□28mm	□38mm	□42mm
Basic step angle	0.72°	0.72°	0.72°	0.36°	0.72°
Excitation maximus still torque	0.048N·m	0.048N·m	0.048N·m	0.135N·m	0.171N·m
Roter inertial moment	9×10 <sup>-7</sup> kg·m <sup>2</sup>	9×10 <sup>-7</sup> kg·m <sup>2</sup>	9×10 <sup>-7</sup> kg·m <sup>2</sup>	35×10 <sup>-7</sup> kg·m <sup>2</sup>	54×10 <sup>-7</sup> kg·m <sup>2</sup>
Mass	0.11kg	0.11kg	0.11kg	0.27kg	0.27kg
Temperature	-10°C~+50°C				
Recommended driver	SD5107P3-A22 CRD5107P DFC5107P RKD507-A				
Stage(single axis)	PG	KS101-30	KXG KXC KGB KRB KRW KXL KGW KXT KRE	· C7214-9015-1 KX KS101-30MS KS102 KS402-75 · C9582-9015-1 KG KH	KS402-100 KS402-180 KS332

### No electromagnetic brake(Oriental motor)

Motor model	PK523HPMB...	PK525HPB...	PK546PB	PK523HPB-C17
Phases	5 phase			
Rated current	0.75A/Phase			
Size	□28mm	□28mm	□42mm	□28mm
Basic step angle	0.36°	0.72°	0.72°	0.72°
Excitation maximus still torque	0.038N·m	0.073N·m	0.42N·m	0.048N·m
Roter inertial moment	9×10 <sup>-7</sup> kg·m <sup>2</sup>	18×10 <sup>-7</sup> kg·m <sup>2</sup>	114×10 <sup>-7</sup> kg·m <sup>2</sup>	9×10 <sup>-7</sup> kg·m <sup>2</sup>
Mass	0.11kg	0.2kg	0.5kg	0.11kg
Temperature	-10°C~+50°C			
Recommended driver	SD5107P3-A22 CRD5107P DFC5107P RKD507-A			
Stage(single axis)	PG KXG KXL KXC KHC		KXS	KHE

X

XY

Z

Horizontal plane Z

XYZ

Goniometer

Rotary

Unit

Controller

■ With electromagnetic brake (Oriental Motor Co.,Ltd.)

Motor model	PK545AWM	PK566AEM
Phase	5Phase	
Rated current	0.75A/Phase	1.4A/Phase
Size	□42mm	□60mm
Basic step angle	0.72°	
Max.magnetized stopping torque	0.24N·m	0.83N·m
Rotor inertial moment	83×10 <sup>-7</sup> kg·m <sup>2</sup>	440×10 <sup>-7</sup> kg·m <sup>2</sup>
Input voltage of excitation brake	DC24V 0.08A	DC24V 0.25A
Excitation brake static friction torque	0.22N·m	0.8N·m
Mass	0.52kg	1.1kg
Temperature	-10°C~+50°C	
Driver type (Set model)	RKD507M-A	RKD514LM-A
Stage(single axis)	PG KXG KXL	KXS


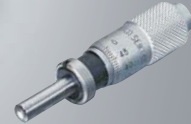





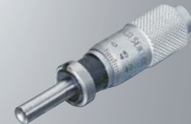
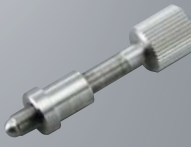


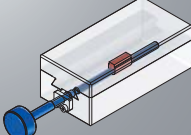


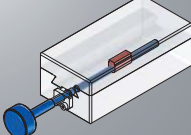


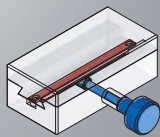





■ α step motor (Oriental Motor Co.,Ltd.)

Motor model	ASM34AK	ASM46AA
Size	□28mm	□42mm
Resolution (Set to 1000P/R)	0.36°	
Max.magnetized stopping torque	0.055N·m	0.3N·m
Rotor inertial moment	9×10 <sup>-7</sup> kg·m <sup>2</sup>	68×10 <sup>-7</sup> kg·m <sup>2</sup>
Input voltage of excitation brake	—	
Excitation brake static friction torque	—	
Mass	0.15kg	0.5kg
Temperature	0°C~+50°C	
Driver type (Set model)	ASD10A-K (ASC34AK)	ASD13A-A (AS46AA)
Driver power input	DC24V±10%	Single phase100-115V 50/60Hz
Driver input current	1.0A	3.3A
Stage(single axis)	KXC KS101-30QN PG KXG KXL	KS101-30TN KS102-□TN KXS

■ AC servo motor (Mitsubishi electric co.,Ltd.)

Motor model	HF-KP053	HF-KP13
Size	□40mm	
Resolution (1Rotary)	262144p/rev	
Speed detector	18 bits encoder	
Rated rotation speed	3000r/min	
Rated output	50W	100W
Rated torque	0.16N·m	0.32N·m
Max. Torque	0.48N·m	0.95N·m
Inertial moment	0.052×10 <sup>-4</sup> kg·m <sup>2</sup>	0.088×10 <sup>-4</sup> kg·m <sup>2</sup>
Rated current	0.9A	0.8A
Mass	0.35kg	0.56kg
Temperature	0°C~40°C	
Driver type (Set model)	MR-J3-10A	
Stage(single axis)	PG KXL	KXS

## Selection Guide

Travel distance per rotation	Feeding Type	Stage table size	Load capacity	Stroke (mm)						
				~13	~18	~50	~60	~360		
<b>Fine positioning</b> 	<b>Micrometer</b>  <b>Feeding screw</b> 	<input type="checkbox"/> 25 } 60×120	4kgf } 35kgf	<b>Linear ball guide (BXT series)</b>  * BXT series <input type="checkbox"/> 40/ <input type="checkbox"/> 60 Stroke 13mm  <b>2-015~</b> Page	<b>Linear ball guide (SS stages)</b> Stroke 6.4~25mm   <b>2-013~</b> Page					
	<b>Micrometer</b>  <b>Feeding screw</b> 	<input type="checkbox"/> 25 } <input type="checkbox"/> 120	4kgf } 20kgf		<b>Cross roller guide</b>   <b>2-061~</b> Page Stroke 6.4~50mm					
	<b>Short lead feeding screw</b> 	<input type="checkbox"/> 25 } <input type="checkbox"/> 60			<b>Dovetail type short lead feeding screw</b>   <b>2-095~</b> Page Stroke 10~18mm					
<b>Long lead feeding screw</b> 	<input type="checkbox"/> 40 } 40×80		2kgf } 5kgf	 <b>2-095~</b> Page Stroke 20~60mm	<b>Dovetail type long lead feeding screw</b> 					
<b>Rack and pinion</b> 	<input type="checkbox"/> 25 } 60×120				<b>Dovetail type rack and pinion</b>   <b>2-095~</b> Page Stroke 10~100mm					
<b>Move widely</b> 				 <b>2-095~</b> Page Stroke 50~360mm	<b>Dovetail type rack and rail</b> 					

## Horizontal Z-axis stage

Linear ball guide



Rack and pinion



Cross roller guide



Laboratory jack



## Goniometer stage

2-135~  
Page

Dovetail



Cross roller (Worm type)



Cross roller (Micrometer)



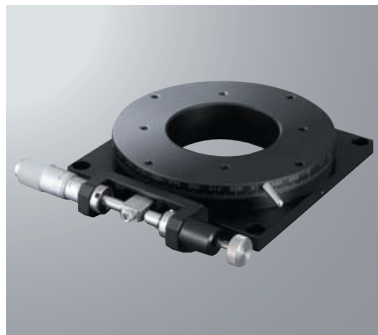
## Rotation stage

2-167~  
Page

Fitting



Cross roller bearing



Square



\*Square P.2-169~

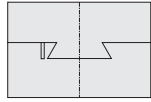
## Manual Stages Lineup

\*A load capacity shows a numerical value of the single-axis.

Linear-motion (slideway guide)

Guide mechanism

**Dovetail**



▶ P.2-095~

Distinctive model

**B05 (Rack and pinion)**



**B08 (Feeding screw)**

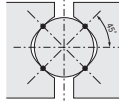


Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Thin type	Travel distance per rotation of knob	Rigidity	Prices	Main materials
3~5 [29.4~49]	10~360	○	△	◎	○	○	Brass Aluminum
2~4 [19.6~39.2]	6~60	○	◎	○	○	◎	Brass Aluminum

Linear-motion (ball guide)

Guide mechanism

**Linear ball guide**



▶ P.2-015~ BXT  
▶ P.2-013~ BSS/BSB  
▶ P.2-031~ BSL

Distinctive model

**BXT (Low prices)**



**BSS/BSB (Thin type·High rigidity)**



**BSL (Long stroke)**




Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Thin type	Resolution	Rigidity	Prices	Main materials
10~20 [98~196]	13	○	○	○	◎	◎	Steel
4~35 [39.2~343]	6.4~25	◎	◎	○	◎	○	Stainless
15~20 [147~196]	25~50	◎	◎	○	◎	○	Stainless

**Cross roller guide**




▶ P.2-061~

**B11 (Light and high precision)**



**B12 (Long stroke)**



Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Thin type	Resolution	Rigidity	Prices	Main materials
1~20 [9.8~196]	6.4~50	◎	○	○	○	○	Aluminum
2~8 [19.6~78.4]	13~40	○	△	◎	○	△	Aluminum

**Slide guide**




▶ P.2-091~

**B10 (High resolution)**



**B15 (Long stroke)**




Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Thin type	Resolution	Rigidity	Prices	Main materials
4.6~6.0 [45~58.8]	13~25	◎	△	◎	○	△	Aluminum
15 [147]	128	○	△	△	○	△	Aluminum

Horizontal Z axis stage


Guide mechanism

**Dovetail**




▶ P.2-121~

**Cross roller guide**



▶ P.2-082~

**Jack type**



▶ P.2-094

Distinctive model

**B07 (Rack and pinion)**



**B33·B37**



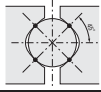

**B35 (Laboratory jack)**



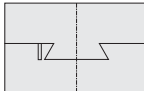




Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Travel distance per rotation of knob	Resolution	Rigidity	Prices	Main materials
0.7~1.5 [6.86~14.7]	8~18	○	◎	△	△	◎	Brass Aluminum
1~6 [9.8~58.8]	4~13	◎	○	○	○	○	Aluminum Stainless
7~10 [68.6~98]	40~70	△	◎	△	○	△	Aluminum

\*A load capacity shows a numerical value of the single-axis.




Horizontal Z axis stage

Guide mechanism	Distinctive model	Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Resolution	Prices	Main materials
<b>Linear ball guide</b>  ▶ P.2-055~	<b>BHE (Low prices)</b> 	3~5 [29.4~49]	6~10	△	○	◎	Steel





Gonio stage

Guide mechanism	Distinctive model	Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Resolution	Prices	Main materials
<b>Dovetail</b>  ▶ P.2-137~	<b>B54 (Worm gear)</b> 	1~6 [9.8~58.8]	16~50	○	○	○	Brass
<b>Cross roller guide</b>  ▶ P.2-149~	<b>B56 (Worm gear)</b> 	3~5 [29.4~49]	8~20	◎	○	△	Brass Aluminum
	<b>B58 (Micrometer)</b> 	3~5 [29.4~49]	5~14	◎	◎	△	Aluminum





Rotation stage

Guide mechanism	Distinctive model	Load capacity (kgf [N])	Travel distance (mm)	Travel accuracy	Resolution	Prices	Main materials
<b>Fitting</b> ▶ P.2-169~ BRE ▶ P.2-171~ B43	<b>BRE (Low prices)</b> 	1~3 [9.8~29.4]	20	△	○	◎	Aluminum
	<b>B43 (Fitting)</b> 	1~5 [9.8~49]	360	○	○	○	Aluminum
<b>Bearing</b> ▶ P.2-173~	<b>B47 (Cross roller)</b> 	5~6 [49~58.8]	360	○	◎	△	Aluminum Stainless

Unit

<b>Combination with multi-axis</b>  ▶ P.2-175~	<b>XYθ</b> 	<b>XYZθ</b> 	<b>XYZθxθy</b> 
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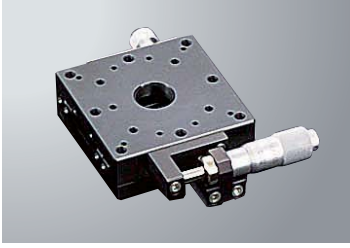

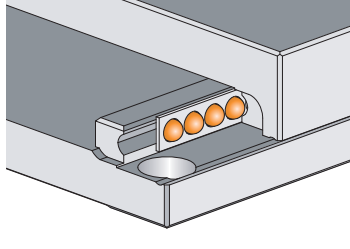
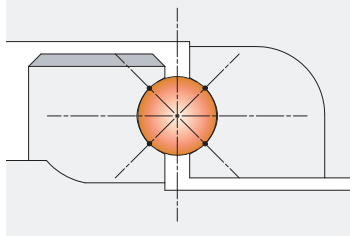
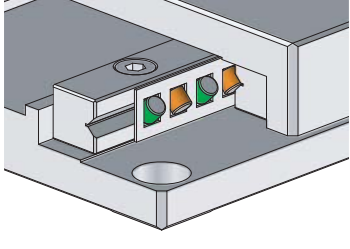
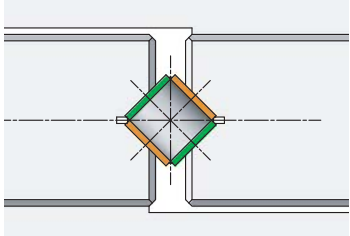
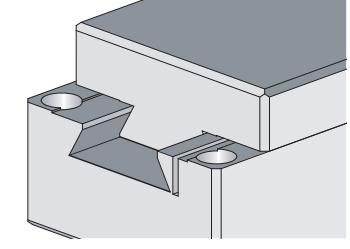
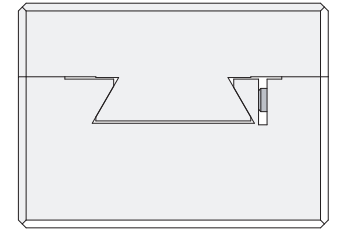
Accessory

<b>Micrometer (maintenance parts)</b>  ▶ P.2-177~	<b>Feeding screw</b> 	<b>Z-axis bracket</b> 	<b>Adaptor plate</b> 
--	---	---	---

Guidance

<b>[Manual stages guidance]</b>	<b>[Related page]</b>
● Selection guide ..... P.2-001~	● How to use ..... P.2-008
● Manual stage line-up ..... P.2-003~	● Options ..... P.2-009~
● How to read the specification table ... P.2-007~	● Service and Guarantee ..... P.001
	● Inspections ..... P.2-187~
	● How to handle the stage ..... P.021~
	● Grease ..... P.023~

Guidance

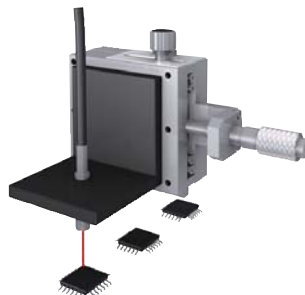
Series	Linear ball	Cross roller	Dovetail
<b>Image</b>			
<b>Guide structure</b>	  <ul style="list-style-type: none"> <li>• 4-point contact rolling mechanism of Gothic arc groove and ball.</li> </ul>	  <ul style="list-style-type: none"> <li>• Rolling mechanism of a V groove rail and roller.</li> </ul>	  <ul style="list-style-type: none"> <li>• Sliding mechanism of male and female trapezoidal. (Fitting)</li> </ul>
<b>Feature</b>	<ul style="list-style-type: none"> <li>• Integrated travel guide and body. Thin type.</li> <li>• SS stages in stainless steel are high rigidity, high precision and high load capacity.</li> <li>• Also available black type.</li> </ul>	<ul style="list-style-type: none"> <li>• Light weight (Aluminum)</li> <li>• High precision</li> </ul>	<ul style="list-style-type: none"> <li>• Variety of strokes</li> <li>• Low price</li> </ul>
<b>Stages for use</b>	Linear ball • Horizontal Z stages	Linear ball • Rotation • Horizontal Z • Goniometer stages	Linear ball • Horizontal Z • Goniometer

### Application example

#### Alignment of CCD camera



#### Alignment of fiber sensor



#### Inspection or analysis jig for samples



Series	Feeding Type	Size (mm)	Travel distance per rotation (mm)	Load capacity (kgf) [N]	Material	Single-axis stroke (mm)																
						~5	~10	~15	~20	~30	~40	~50	~75	~100	~150	~250	~360					
Linear ball P.2-013~	Micrometer Feeding screw	□25	0.05~1	~4 [~39.2]	Stainless	■	■															
		□40		~10 [~98]		■	■	■														
		□50		~15 [~147]		■	■	■														
		□60		~20 [~196]		■	■	■														
		□70		~23 [~225]		■	■	■														
		□80		~27 [~264]		■	■	■	■													
		□100		~35 [~343]		■	■	■	■	■												
		40×80		~15 [~147]		■	■	■	■	■												
		60×120		~20 [~196]		■	■	■	■	■	■											
Cross roller P.2-061~	Micrometer Feeding screw	□25	0.05~1	~1 [~9.8]	Aluminum	■	■															
		□40		~2 [~19.6]		■	■	■														
		□60		~5 [~49]		■	■	■														
		□80		~10 [~98]		■	■	■	■													
		□100		~15 [~147]		■	■	■	■	■												
		□120		~20 [~196]		■	■	■	■	■	■											
		25×60		~2 [~19.6]		■	■	■														
		60×110		~8 [~78.4]		■	■	■	■	■	■											
Slide guide P.2-091~	Handle	□80	24	~15 [~147]	Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■				
Dovetail P.2-095~	Rack and rail	□40	20	~3 [~29.4]	Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
		□25	5~20	~3 [~29.4]	Brass	■	■															
	□40	Brass Aluminum			■	■	■															
	□60	~4 [~39.2]		Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	40×80				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	60×120				~5 [~49]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
	Long lead feeding screw	□40	4.2	~2.5 [~24.5]	Brass Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
		40×80		~4 [~39.2]	Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
	Short lead feeding screw	□25	0.5	~3 [~29.4]	Brass	■	■															
		□40				■	■	■														
□60		~4 [~39.2]		Aluminum	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
18×60		~2 [~19.6]			■	■	■															



## How to Read the Specification Table

- ① **Model number**
- ② **Model number (Mirror operation type)**
- ③ **Stage table size**
  - Show the size of stage table
- ④ **Feeding position**
  - Show Center, side, opposite side, L and R for feeding position
- ⑤ **Travel distance**
  - The point where the fixation surface(lower) and the traveling surface(upper) of the stage are the same in the standard and the position is indicated by  $\pm$ .
  - When the standard is not ensured, the full stroke is indicated.
  - Where there is both coarse motion and micromotion, each stroke is indicated.
- ⑥ **Micrometer minimum reading**
  - The minimum scale that can be read by the micrometer head and vernier scale, etc. For high resolution stages, the minimum reading of coarse motion and micromotion is separately described.
- ⑦ **Travel guide**
  - Dovetail
    - This is a method to be guided by sliding male and female trapezoid grooves.
    - The driving mechanisms include rack and pinion and feeding screw.
  - Linear ball guide
    - The stage body and guide are integrated.
    - This is a guiding method where the guide part has a Gothic arc groove and rolling balls
  - Crossed roller guide method
    - This is a rolling sliding guidance method using a Vgroove rail and crossed roller.
  - Slide guide
    - Unlimited track rolling guide is suitable for long stroke.

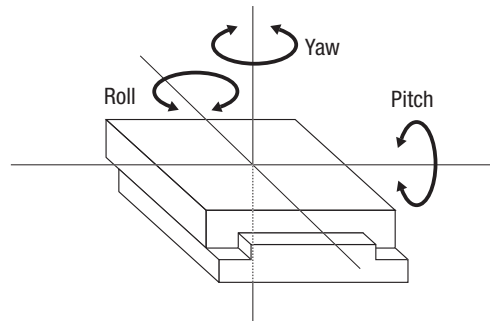
- ⑧ **Load capacity**
  - This is the weight that can be loaded on the center part of the stage.
  - When you exceed this load, the stage may not operate smoothly.
- ⑨ **Tolerance moment load**
  - The allowable maximum moment load on the upper surface of stage.
- ⑩ **Moment rigidity**
  - ▶ See page P.2-187~
- ⑪ **Parallelism**
  - ▶ See page P.2-187~
- ⑫ **Motion parallelism**
  - ▶ See page P.2-187~
- ⑬ **Squareness**
  - ▶ See page P.2-187~
- ⑭ **Verticality**
  - ▶ See page P.2-187~
- ⑮ **Motion varticality**
  - ▶ See page P.2-187~
- ⑯ **Weight**
  - Show the product weight.
- ⑰ **Material**
  - Especially show the finishing materials.
- ⑱ **The provided screws**
  - Attached screw size and number are shown.

		SPEC	
①	<b>Model</b>	<b>B000-00</b>	
②	<b>(Opposite hand)</b>		
③	Stage table size	00×00mm	
④	Feeding position		
⑤	Travel distance	00mm	
⑥	Minimum reading of micrometer	00μm/Scale	
⑦	Guide		
⑧	Load capacity	00kgf [00N]	
⑨	Allowable load for moment	Pitch	00N · m
		Yaw	00N · m
		Roll	00N · m
⑩	Moment rigidity	Pitch	00°N · cm
		Yaw	00°N · cm
		Roll	00°N · cm
⑪	Parallelism	Within 00μm	
⑫	Motion parallelism	Within 00μm	
⑬	Squareness	Within 00μm	
⑭	Verticality	Within 00μm	
⑮	Mortion varticality	Within 00μm	
⑯	Weight	kg	
⑰	Main material—Surface finishing	Aluminum—Black alumite processing	
⑱	Provided screws (Hex socket screws)	○ of M○—○ ○	

### ■ Definition of “pitching, yawing and rolling”

The Torerance moment load and Moment rigidity in the specifications are quantified by the components shown in the following figure.

Refer to the relevant components depending on the conditions.



Refer to the inspection rules for details of the specificatio items and inspection methods. (▶ P.2-187~)

## How to use the manual stage

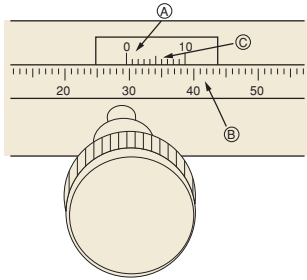
Fix the stage to an opposite base or stage and transfer with feed knob or micrometer.

Please refer how to read the scale as below.

### How to read the scale.

#### ● How to read the vanier scale

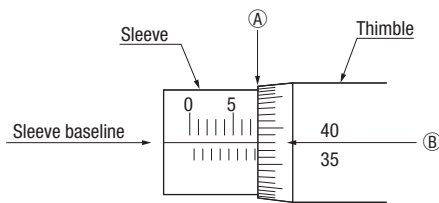
- ① Can be read the 0 point on the vanier scale (A) by 1mm units using the scale of (B). (Shows 29mm in the figure below)
- ② See the scale of (A), then (C) that is on a same position (B). (C) will be a value of 1mm units. (Shows 0.6mm in the figure below)
- ③ Total value of A and B become current position of stage. (7.5mm+0.38mm=7.88mm in the figure below)



#### ● How to read the micrometer head

For the micrometer head 0.01mm reading

- ① Read the position of the thimble edge face from the sleeve by 0.5mm units. (Shows 7.5mm in the figure below)
- ② Read the value of thimble which position well matched sleeve basic line and thimble scale. (Shows 0.38mm in the figure below (B))



## Notice regarding instructions about the installation posture

Must be put on flat surface for each production specification.

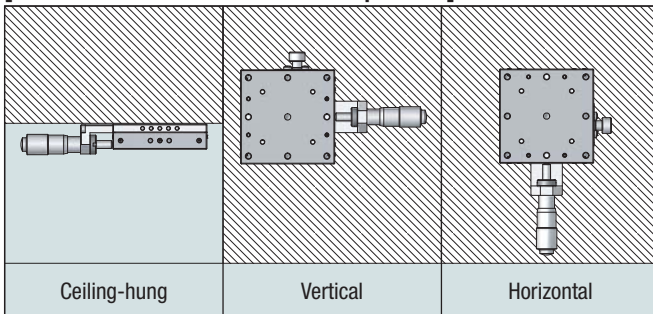
Pay attention in case of vertical, horizontal and ceiling-hung installation.

Load capacity and accuracy might be changed due to installation posture.

See belows, "Definition and characteristics of posture" for more information regarding usable or not.

We hope you find them useful but if you have any questions or need more information, please do not hesitate to contact us.

### [Definition and characteristics of posture]



Classification		Ceiling-hung	Vertical	Horizontal
Linear-motion	Dovetail	○	○	○
	Linear ball guide	○	○	△
	Cross roller guide	○	○	△
	Horizontal Z-axis (Lever type)	×	△	△
Goniometer	Cross roller guide worm type	○	○	○
	Cross roller guide micrometer type	○	○	△
	Dovetail	○	○	○
Rotation	Cross roller guide	○	△	△
	Ball bearing	×	×	×
	Fitting	△	△	△

○ : Means usable, however load and moment is limited.

△ : Load and moment is limited, it may not lose characteristics in some usage or models

× : Not available

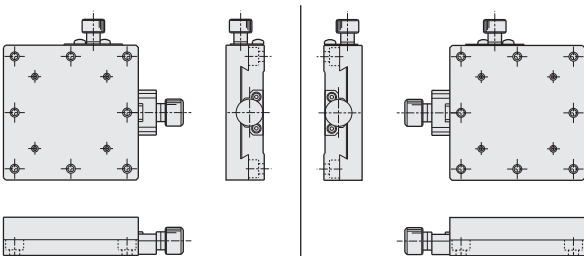
## Opposite operating (Position of the clamp and micrometer)

Selectable opposite operating products for configuration symmetrical system or where is no enough space with same cost.

The configuration/orientation of the opposite operating is shown as belows.:

#### • For single axis

Linely symmetric for the trace diagram.



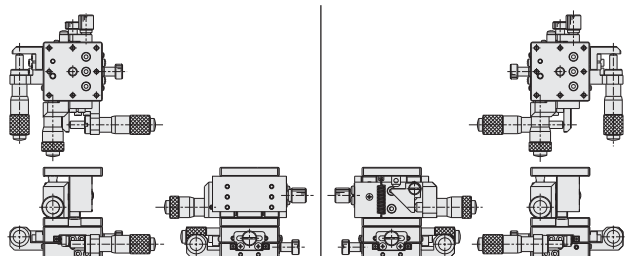
B08-111

Opposite hand: B08-111R

#### • For combined or stage units

Linely symmetric for the trace diagram.

It combines with the standard type, if there is no opposite type in single axis.



B72-40C

Opposite hand: B72-40CR

### Selectable various specification for your purpose



**Feeding position/Opposite hand**

Available variety of space, posture and operation.

Center pushing

Opposite attached micrometer

Vertically attached micrometer

---

**Feeding Type**

Cost reduction/  
Change the screw pitch

Feeding screw

Prevention error  
operation/  
Space-saving

Hex wrench operation

Fine positioning/  
Minimum memory  
0.5μm

Coarse-fine micrometer

Easy reading with  
degimatic

Degimatic micrometer

---

**Clamp Type** ☉SS stage only

Reduce the fixing  
misalignment

Disk clamp

Improve the holding  
power

Opposite clamp

---

**Grease** ☉SS stage only

Selectable depending on your environment

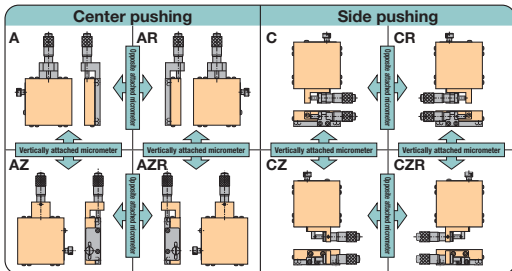
Grease for clean environment

Grease for vacuum environment

\* There exist some combinations of axis or option can't be provided.

### Feeding Position Selectable depending on your mounting space, mounting posture or operation direction.

#### Show the feeding position and models



#### Vertically type (Z type)

**Center pushing A type**

Not available: Stage surface might be down due to over load weight in micrometer.

X NG

**Center pushing AZ type**

Available: Stage surface can be kept due to acceptable load weight in micrometer.

O OK

Stage surface doesn't go down because micrometer can keep the load weight even it will be mounted to upward.

#### Center/Side pushing

There are the center pushing type (A) and side pushing type © for each feeding types.

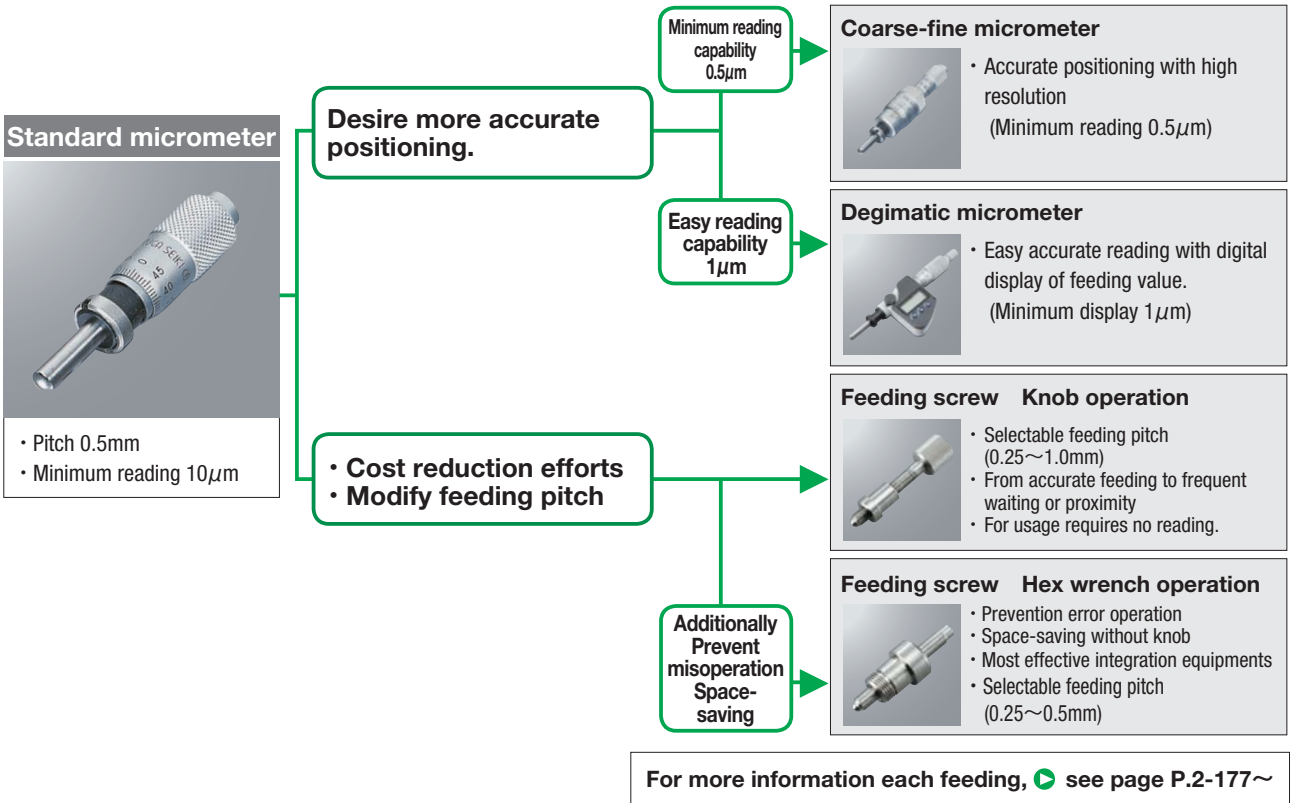
#### Right/left

Selectable from the configuration of line symmetry.

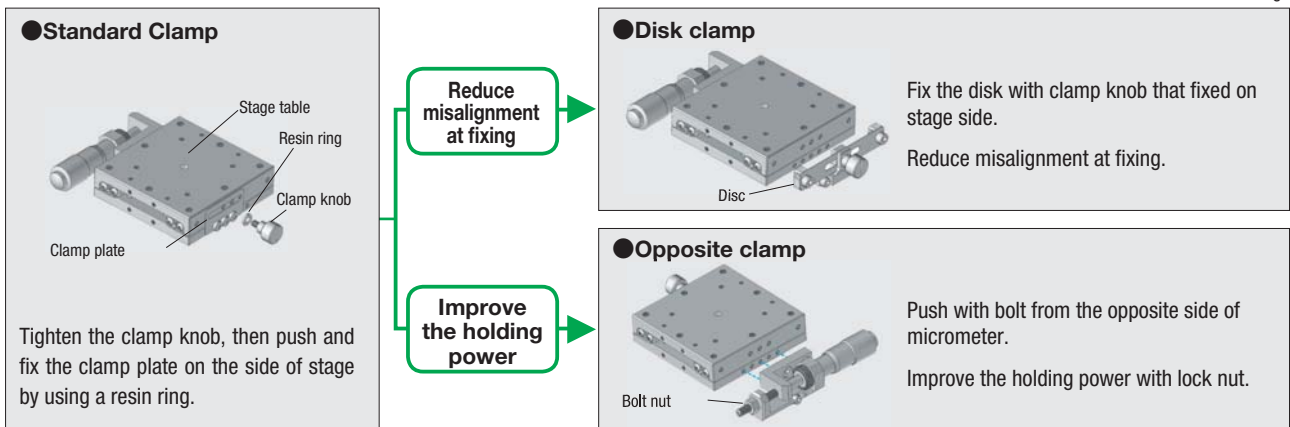
Available vertically mounting								
Feeding position	Center				Side			
Mounting positioning Image								
Vertically attached micrometer	Standard		Vertically attached micrometer		Standard		Vertically attached micrometer	
Code	A	B	AZ	BZ	C	D	CZ	DZ
	AR	BR	AZR	BZR	CR	DR	CZR	DZR

☉ is only for SSstage.

**Feeding Method** Selectable various feeding method depending on your purpose



**Clamp Type** Selectable a clamp type for your usage. SS stage only



**Grease** Selectable grease for environment and purpose SS stage only

Code table for grease

At the end of the code	-J	-L
Compatible equipment		SS stage
Grease	Grease for clean environment	Grease for the vacuum
Change the place	Only standard micrometer head (or feeding screw)*	Standard micromete head (or feeding screw), guide or sliding part.
Grease model/maker	AFF/THK	FOMBLIN/Solvay Specialty Polymers Japan K.K
Range of available temperature	-40~120°C	-20~250°C

- SS stages are used clean environment grease (AFF) (except micrometer)  
 Only micrometer changes when you want to change the specification to 「-J」.
- Not available when select coarse-fine micrometer or degimatic micrometer.
- Please refer the stage guidance for accuracy assurance and delivery date. (P.026)

## Description of model number

You can order the various specifications by adding the option code after the standard model number.  
Add the extra cost to the standard model.



Select the option code as below.

	2 Feeding position				3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)						
Specification	Standard micrometer A	Coarse-fine micrometer B	Standard	Opposite attached micrometer	Vertically attached micrometer	Up/Down-Left/Right opposite	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic micrometer		
	C	D													
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	1	FP	LP	SH	FH	4		

	5 Clamp type			6 Grease specification		
Specification	Standard clamp	Disk clamp	Opposite clamp	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
	<ul style="list-style-type: none"> <li>Feeding position C • CR and Feeding Type Apply only A/C</li> <li>No Z/R/ZR</li> </ul>		<ul style="list-style-type: none"> <li>Available only Feeding position C • CR and Feeding Type Blank • FH • SH</li> <li>Not available combination use Z/ZR</li> </ul>		<ul style="list-style-type: none"> <li>No feeding position B/D</li> <li>No feeding type 4.</li> </ul>	<ul style="list-style-type: none"> <li>No feeding position B/D</li> <li>No feeding type 4.</li> </ul>
Code	Blank	5	6	Blank	J	L

Ⓜ A color of the parts may be silver due to the option model.

## Selection example

Please select the option model after checking below chart.(see above for more details)

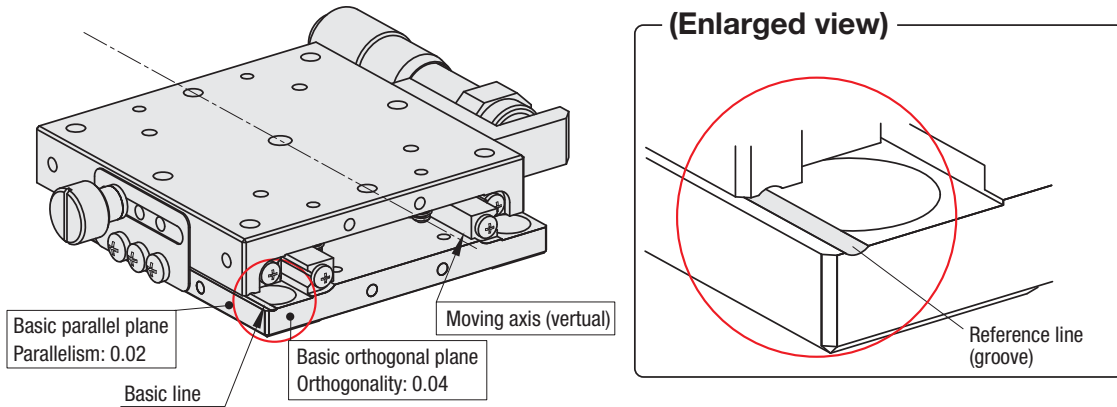
Linear ball Decision	Condition	Model
Main body	<ul style="list-style-type: none"> <li>Travel distance:10mm</li> <li>Mounting load: approx.10kgf</li> <li>Size:60×60mm</li> </ul>	BSS16-60
Feeding position	<ul style="list-style-type: none"> <li>Side pushing</li> </ul>	BSS16-60C
Opposite type	<ul style="list-style-type: none"> <li>Opposite attached micrometer</li> </ul>	BSS16-60CR
Feeding type	<ul style="list-style-type: none"> <li>Feeding screw: pitch 0.5mm</li> </ul>	BSS16-60CR1
Clamp	<ul style="list-style-type: none"> <li>Disc clamp</li> </ul>	BSS16-60CR15
Grease	<ul style="list-style-type: none"> <li>Clean grease</li> </ul>	BSS16-60CR15-J

**Goal**

**Model: BSS16-60CR15-J**



■ For the standard attached surface



Our linear ball guide stage has the standard plane of parallelism and orthogonality to the moving axis. Shows the standard plane as below.

## 3DCAD is described from PARTcommunity

CADENAS group company provides CAD data download service PART community. Available download variety of parts data.



<https://service.web2cad.co.jp/> User registration is necessary to download

## X-axis Linear Ball Guide BXT Series □40□60: BXT04013/BXT06013

RoHS



BXT04013-CL



BXT04013-UL



BXT06013-CL



BXT06013-UL

**1** Model  
**BXT04013-CL**  
**Option code**  
1 2 3 4

**1** Stage table size

04	40mm
06	60mm

**2** Travel distance

013	13mm
-----	------

**3** Feeding position

C	Side
U	Side Vertically attached micrometer

**4** Operating position

L	L opposite hand
R	Opposite hand

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

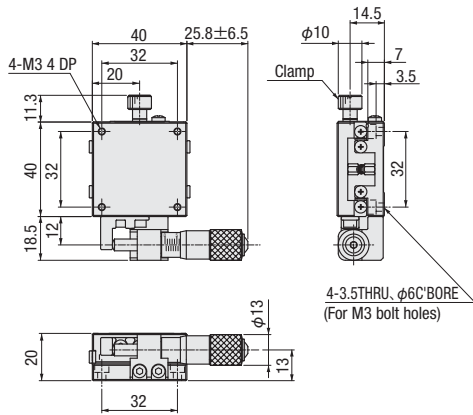
□120

Other

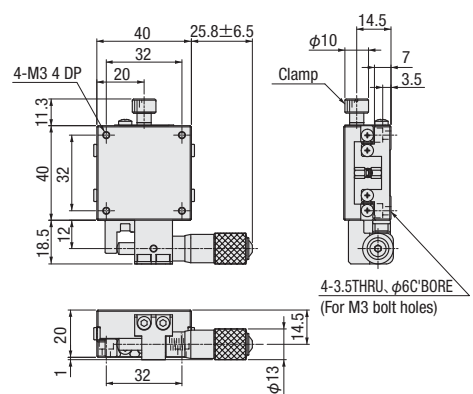
SPEC		
Model	BXT04013	BXT06013
<b>Stage table size</b>	<b>40×40mm</b>	<b>60×60mm</b>
Operation position	Side	Side
Travel distance	±6.5mm	±6.5mm
Minimum reading of micrometer	10μm	10μm
Travel guide	Linear ball guide	Linear ball guide
Load capacity	10kgf [98N]	20kgf [196N]
Travel accuracy	Straightness	10μm
	Pitching	30"
	Yawing	25"
Moment rigidity	Pitch	0.38"/N · cm
	Yaw	0.35"/N · cm
	Roll	0.21"/N · cm
Parallelism	30μm	30μm
Weight	0.24kg	0.44kg
Main material—Surface finishing	Steel—Electroless nickel plating	Steel—Electroless nickel plating
Provided screws (Hex socket screws)	4 of M3—8	4 of M4—8

**Dimensional outline drawings**

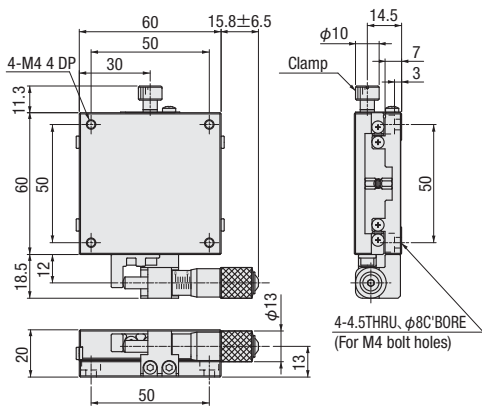
**BXT04013-CL**



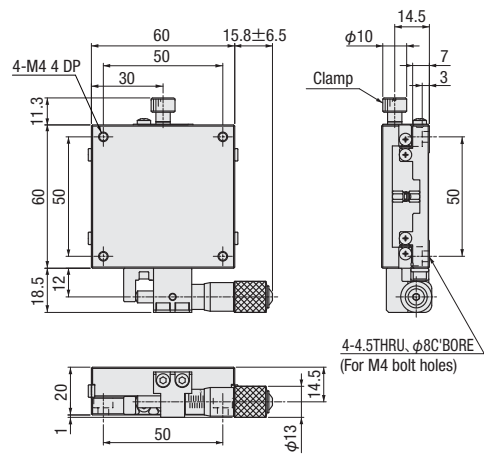
**BXT04013-UL**



**BXT06013-CL**



**BXT06013-UL**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

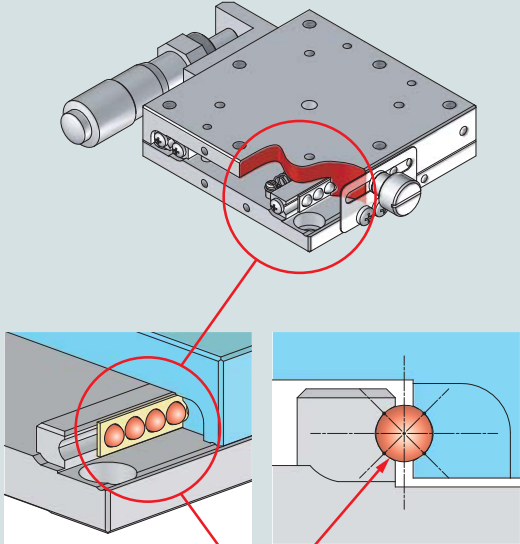


## Linear Ball Guide (SS) Stage Guidance/Line-up

### [Features]

- Thin structure stages which integrate the guide and main body.
- The combination of the stainless mainbody and gothic arc groove for a guide allows high rigidity and high accuracy. ※BXT series made by steel.
- Its wide specification line up helps cutomers improve productivity and quality.

### Mechanism



Gothic arc groove  
(4points contact rolling mechanism)

### Feature

- Thin type Main body thickness :16mm
- High rigidity Load capacity :20kgf
- High precision Straightness :1μm

\*Specification example in case of 60x60mm

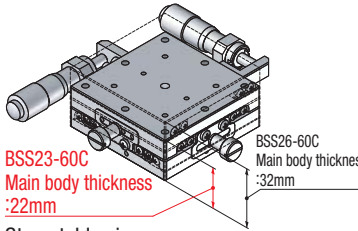
**Low price** Low price linear ball guide BXT series ▶ P.2-015~

Series	Stage table size (mm)	Travel distance per rotation (mm)	Load capacity (kgf) [N]	Main material	
<b>BXT series</b> (Electroless nickel plating)	□40	0.5	10 [98]	Steel	
	□60		20 [196]		
<b>BSS series</b> (Electroless nickel plating)	□25	0.25~0.5	4 [39.2]	Stainless	
	□40		10 [98]		
	□50		15 [147]		
	□60	0.25~1.0	20 [196]		
	□70		23 [225.4]		
	□80		0.5~1.0		27 [264.6]
	□100				35 [343]
<b>BSB series</b> (Low temperature black chrome plating)	□25	0.25~0.5	4 [39.2]	Stainless	
	□40		10 [98]		
	□60	0.25~1.0	20 [196]		
	□80		27 [264.6]		
<b>BSL series</b> (Long stroke)	40×80	0.5~1.0	15 [147]	Stainless	
	60×120		20 [196]		

\* Amount shows for single axis

### XY thin type BSS23 series

Reduce 31% of thickness by integrated XY



**BSS23-60C**  
Main body thickness :22mm

Stage table size 40×40~100×100mm ▶ P.2-039~

### Clamp on a operator's end

Control operation from the one-way direction



XY-axis ▶ P.2-035~

### Multi mounting positioning

Can be mounted a variety of direction such as vertical, tilt and horizontal.



▶ P.2-037~

See page P.2-055~ for BHE(linear ball guide horizontal Z)

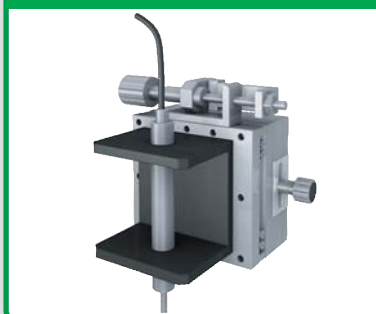
Series	Stage table size (mm)	Stroke (X-axis/mm)						Axis configuration · Listing page							
		~5	~10	~15	~20	~30	~40	~50	X	Thin type XY	XY	Z	XZ	XYZ thin	XYZ
BXT	□40	■	■						● ▶ P.2-015~		● ▶ P.2-043~	● ▶ P.2-053~			
	□60	■	■						● ▶ P.2-015~		● ▶ P.2-043~	● ▶ P.2-053~			
BSS	□25	■	■						● ▶ P.2-017~		● ▶ P.2-045~	● ▶ P.2-057	● ▶ P.2-058		● ▶ P.2-060
	□40	■	■	■					● ▶ P.2-019~	● ▶ P.2-039~	● ▶ P.2-047~	● ▶ P.2-057	● ▶ P.2-058	● ▶ P.2-059	● ▶ P.2-060
	□50	■	■	■					● ▶ P.2-021~	● ▶ P.2-039~	● ▶ P.2-047~	● ▶ P.2-057	● ▶ P.2-058	● ▶ P.2-059	● ▶ P.2-060
	□60	■	■	■					● ▶ P.2-023~	● ▶ P.2-039~	● ▶ P.2-049~	● ▶ P.2-057	● ▶ P.2-058	● ▶ P.2-059	● ▶ P.2-060
	□70	■	■	■					● ▶ P.2-025~	● ▶ P.2-039~	● ▶ P.2-049~	● ▶ P.2-057	● ▶ P.2-058	● ▶ P.2-059	● ▶ P.2-060
	□80	■	■	■	■				● ▶ P.2-027~	● ▶ P.2-041~	● ▶ P.2-051~	● ▶ P.2-057	● ▶ P.2-058	● ▶ P.2-059	● ▶ P.2-060
	□100	■	■	■	■	■			● ▶ P.2-029~	● ▶ P.2-041~	● ▶ P.2-051~				
BSB	□25	■	■						● ▶ P.2-017~		● ▶ P.2-045~	● ▶ P.2-057	● ▶ P.2-058		● ▶ P.2-060
	□40	■	■	■					● ▶ P.2-019~		● ▶ P.2-047~	● ▶ P.2-057	● ▶ P.2-058		● ▶ P.2-060
	□60	■	■	■					● ▶ P.2-023~		● ▶ P.2-049~	● ▶ P.2-057	● ▶ P.2-058		● ▶ P.2-060
	□80	■	■	■	■				● ▶ P.2-027~		● ▶ P.2-051~	● ▶ P.2-057	● ▶ P.2-058		● ▶ P.2-060
BSL	40×80	■	■	■	■				● ▶ P.2-031~						
	60×120	■	■	■	■	■			● ▶ P.2-031~						

Application example

Sample inspection table (Thin type XY)



Control the dispenser head



Sample inspection table (Integrated rotation stage)



## X-axis Linear Ball Guide (SS) Stage □25: BSS16-25/BSB16-25

BSS16-25C



BSB16-25C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [P.2-009~](#)

**Cost reduction**  
Feeding screw



**Prevention error · Space-saving**  
Feeding screw hexagonal wrench operation



1 Model

**BSS16-25**  
**BSB16-25CR** □ - □

Option code

2 3 4 5

Select the option code as below.

	2 Feeding position		3 Operating position					4 Feeding type					5 Grease specification		
Specification	Standard micro A C	Standard	Opposite attached micrometer	Vertically attached micrometer	Up/Down-Left/Right opposite	Standard micro (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN		
Code	A/C Center/Side	Blank	R	Z	ZR	Blank	1	FP	SH	FH	Blank	J	L		

ⓘ A color of the parts may be silver due to the option model.

### SPEC

Model	BSS16-25A	BSS16-25AZ	BSS16-25C	BSS16-25CZ	BSB16-25A	BSB16-25AZ	BSB16-25C	BSB16-25CZ
(Opposite hand)	BSS16-25AR	BSS16-25AZR	BSS16-25CR	BSS16-25CZR	BSB16-25AR	BSB16-25AZR	BSB16-25CR	BSB16-25CZR
Stage table size	25×25mm							
Feeding position	Center		Side		Center		Side	
Travel distance	±3.2mm							
Minimum reading of micrometer	10μm							
Guide	Linear ball guide							
Load capacity	4kgf [39.2N]							
Travel accuracy	Straightness		Within 3μm					
	Pitching		Within 30"					
	Yawing		Within 25"					
Allowable load for moment	Pitch		2.0N · m					
	Yaw		2.0N · m					
	Roll		3.5N · m					
Moment rigidity	Pitch		1.9"/N · cm					
	Yaw		1.1"/N · cm					
	Roll		1.1"/N · cm					
Parallelism	Within 30μm							
Motion parallelism	Within 10μm							
Weight	0.07kg							
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating			
Provided screws (Hex socket screws)	4 of M2—4							

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

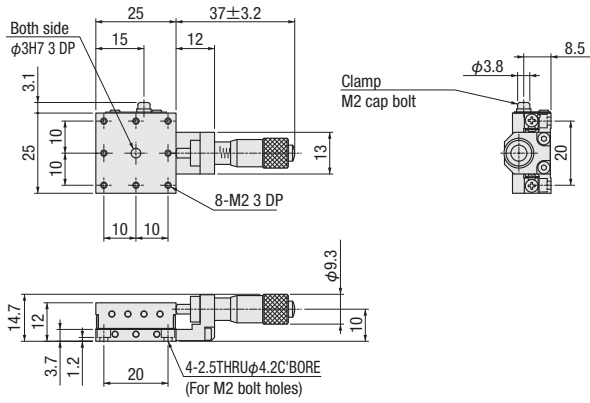
Other

**Dimensional outline drawings**

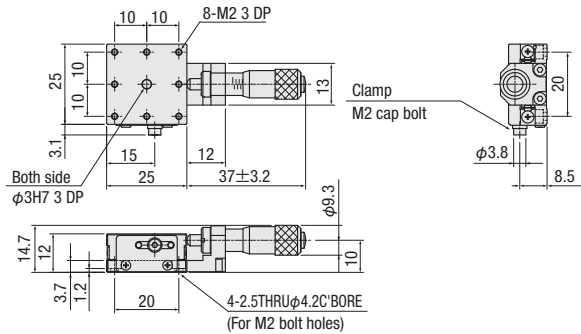
☉ The center hole tolerance H8 for BSB.



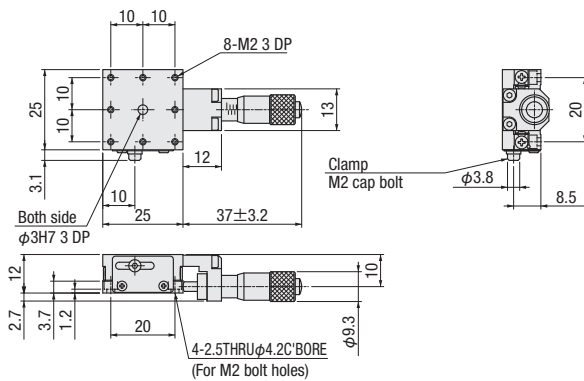
**BSS16-25A/BSB16-25A**



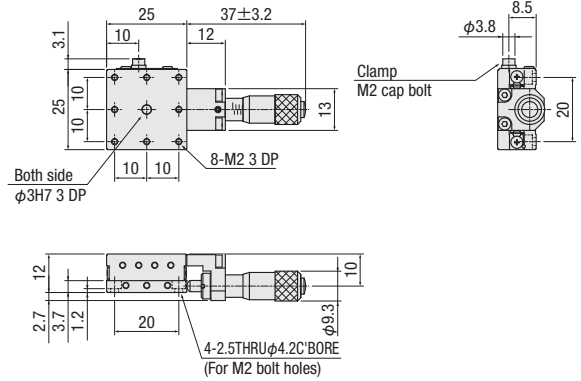
**BSS16-25AR/BSB16-25AR**



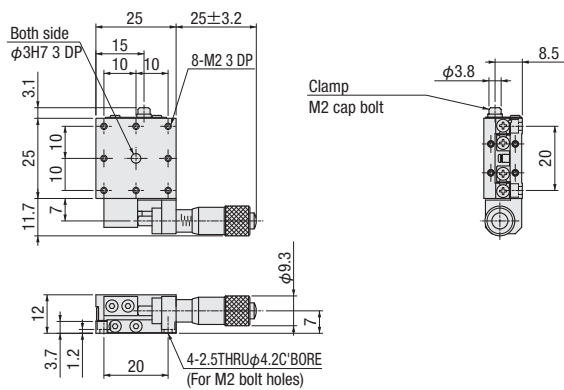
**BSS16-25AZ/BSB16-25AZ**



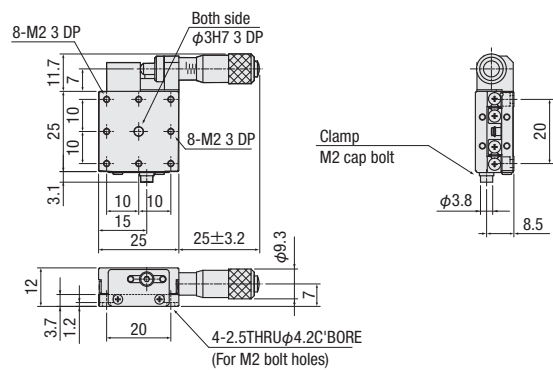
**BSS16-25AZR/BSB16-25AZR**



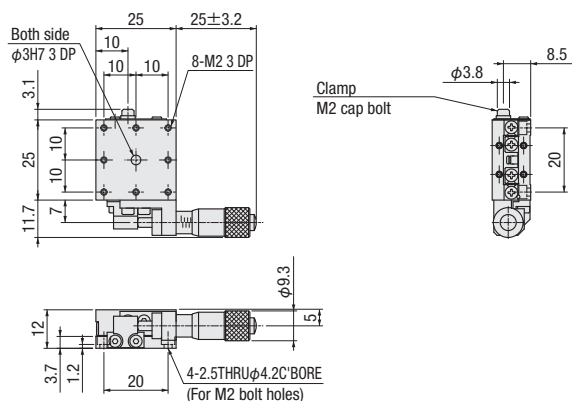
**BSS16-25C/BSB16-25C**



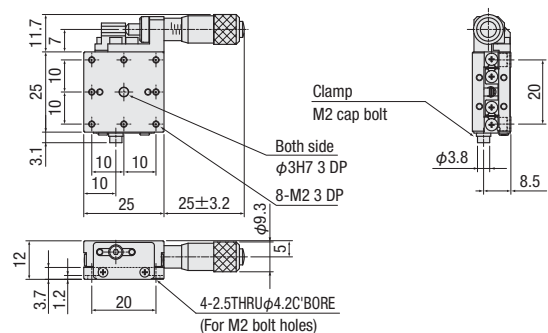
**BSS16-25CR/BSB16-25CR**



**BSS16-25CZ/BSB16-25CZ**



**BSS16-25CZR/BSB16-25CZR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

## X-axis Linear Ball Guide (SS) Stage □40: BSS16-40/BSB16-40

BSS16-40C



BSB16-40C



Low prices

Linear ball guide  
BXT series



▶ P.2-015~

RoHS

Optional sample \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. ▶ P.2-009

Precise positioning  
Coarse-fine micro



Cost reduction  
Feeding screw



Prevention error · Space-saving  
Feeding screw hexagonal wrench operation



Reduce the reading time  
Degimatic micro



Improve the fixing accuracy  
Disk clamp



Improve the holding power  
Opposite clamp



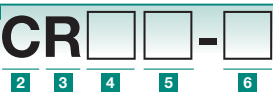
\*\*Image is for □80.

1 Model

# BSS16-40

# BSB16-40CR

Option code



Select the option code as below.

	2 Feeding position		3 Operating position					4 Feeding type (Not available feeding position B/D when selecting)					5 Clamp type			6 Grease specification			
Specifier	Standard micro A	Coarse-fine micro B	Standard C	Opposite attached micrometer D	Vertically attached micrometer E	Up/Down-Left/Right opposite F	Standard micro (P=0.5mm) G	Feeding screw (Knob) (P=0.5mm) H	Feeding screw (Knob) (P=0.25mm) I	Feeding screw (Knob) (P=1.0mm) J	Feeding screw (Hex wrench) (P=0.5mm) K	Feeding screw (Hex wrench) (P=0.25mm) L	Degimatic micrometer M	Standard clamp N	Disk clamp O	Opposite clamp P	Standard grease Q	Clean environment grease AFF R	Grease for the vacuum FOMBLIN S
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	1	FP	LP	SH	FH	4	Blank	5	6	Blank	J	L

Ⓜ A color of the parts may be silver due to the option model.

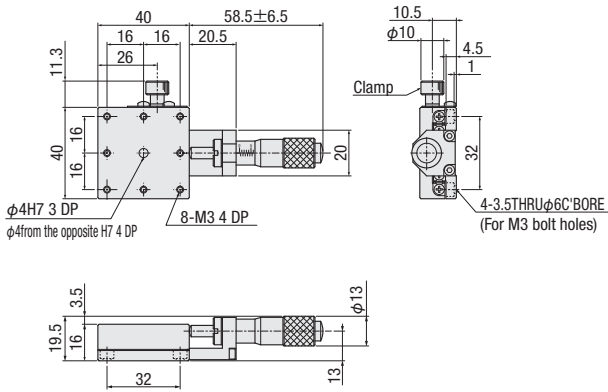
### SPEC

Model	BSS16-40A	BSS16-40AZ	BSS16-40C	BSS16-40CZ	BSB16-40A	BSB16-40AZ	BSB16-40C	BSB16-40CZ
(Opposite hand)	BSS16-40AR	BSS16-40AZR	BSS16-40CR	BSS16-40CZR	BSB16-40AR	BSB16-40AZR	BSB16-40CR	BSB16-40CZR
Stage table size	40×40mm							
Feeding position	Center		Side		Center		Side	
Travel distance	±6.5							
Minimum reading of micrometer	10μm							
Guide	Linear ball guide							
Load capacity	10kgf [98N]							
Travel accuracy	Straightness		Within 1μm				Within 3μm	
	Pitching				Within 25"			
	Yawing				Within 15"			
Allowable load for moment	Pitch		5.0N · m					
	Yaw		5.0N · m					
	Roll		5.0N · m					
Moment rigidity	Pitch		0.42"/N · cm					
	Yaw		0.35"/N · cm					
	Roll		0.21"/N · cm					
Parallelism	Within 15μm							
Motion parallelism	Within 7μm							
Weight	0.23kg							
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating			
Provided screws (Hex socket screws)	4 of M3—6							

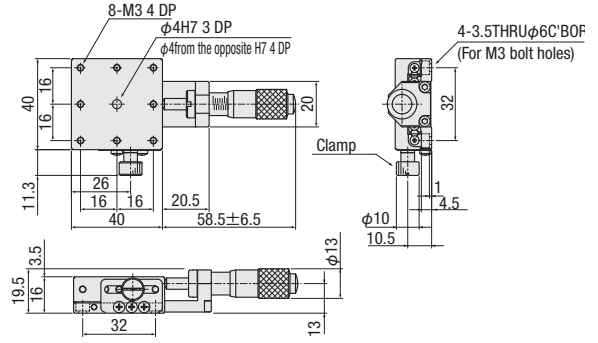
**Dimensional outline drawings**

☉ The center hole tolerance H8 for BSB.

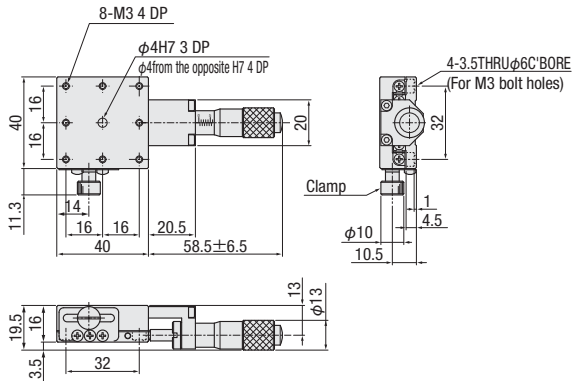
**BSS16-40A/BSB16-40A**



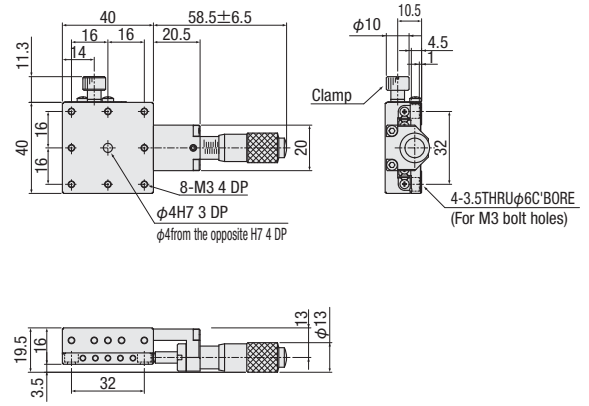
**BSS16-40AR/BSB16-40AR**



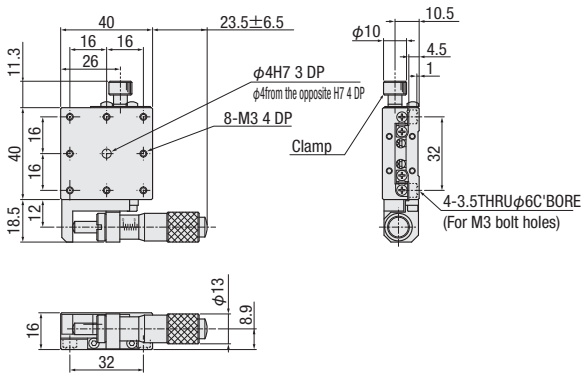
**BSS16-40AZ/BSB16-40AZ**



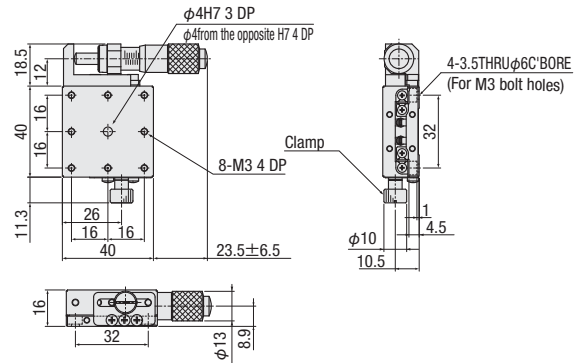
**BSS16-40AZR/BSB16-40AZR**



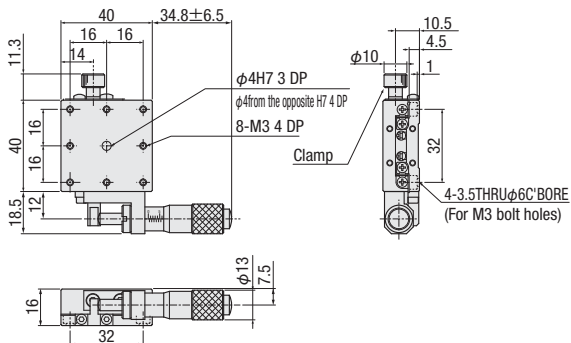
**BSS16-40C/BSB16-40C**



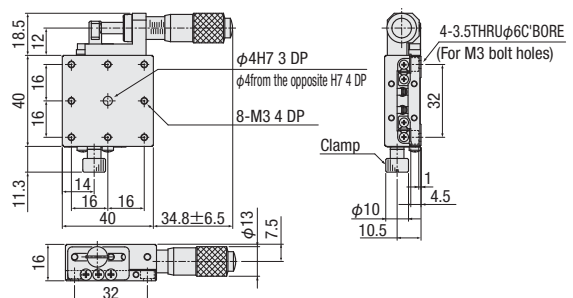
**BSS16-40CR/BSB16-40CR**



**BSS16-40CZ/BSB16-40CZ**



**BSS16-40CZR/BSB16-40CZR**



## X-axis Linear Ball Guide (SS) Stage □50: BSS16-50

BSS16-50C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. [▶P.2-009~](#)

**Precise positioning**

Coarse-fine micro



**Cost reduction**

Feeding screw



**Prevention error · Space-saving**

Feeding screw hexagonal wrench operation



**Reduce the reading time**

Degimatic micro



**Improve the fixing accuracy**

Disk clamp



**Improve the holding power**

Opposite clamp



※Image is for □80.

1 Model

Option code

**BSS16-50CR** □ □ - □ □

2 3 4 5 6 Select the option code as below.

	2 Feeding position		3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)						5 Clamp type			6 Grease specification			
Specification	Standard micro A C	Coarse-fine micro B D <small>Minimum reading 0.5μm</small>	Standard	Opposite attached micrometer	Vertically attached micrometer	Up/Down/Left/Right opposite	Standard micro (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic micrometer	Standard clamp	Disk clamp	Opposite clamp	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	1	FP	LP	SH	FH	4	Blank	5	6	Blank	J	L

### SPEC

Model	BSS16-50A	BSS16-50AZ	BSS16-50C	BSS16-50CZ
<b>(Opposite hand)</b>	BSS16-50AR	BSS16-50AZR	BSS16-50CR	BSS16-50CZR
Stage table size	50×50mm			
Feeding position	Center		Side	
Travel distance	±6.5mm			
Minimum reading of micrometer	10μm			
Guide	Linear ball guide			
Load capacity	15kgf [147N]			
Travel accuracy	Straightness			
	Pitching			
	Yawing			
Allowable load for moment	Pitch			
	Yaw			
	Roll			
Moment rigidity	Pitch			
	Yaw			
	Roll			
Parallelism	Within 15μm			
Motion parallelism	Within 7μm			
Weight	0.28kg			
Main material—Surface finishing	Stainless—Electroless nickel plating			
Provided screws (Hex socket screws)	4 of M3—6			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

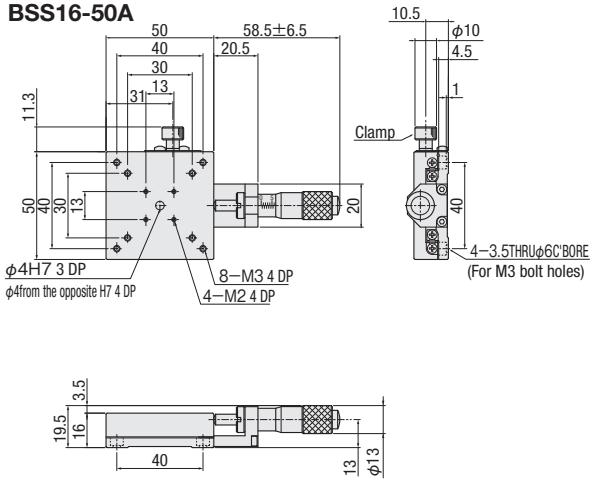
□100

□120

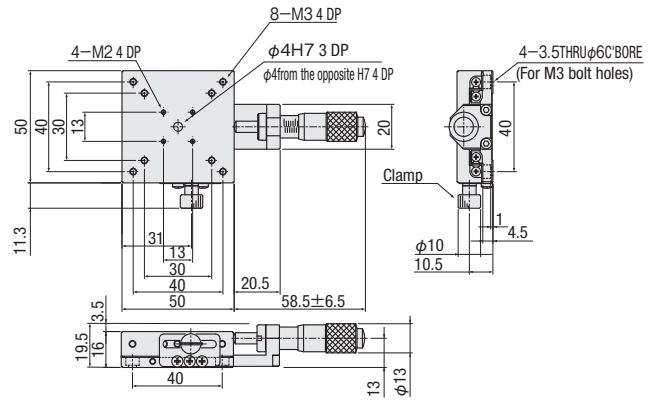
Other

Dimensional outline drawings

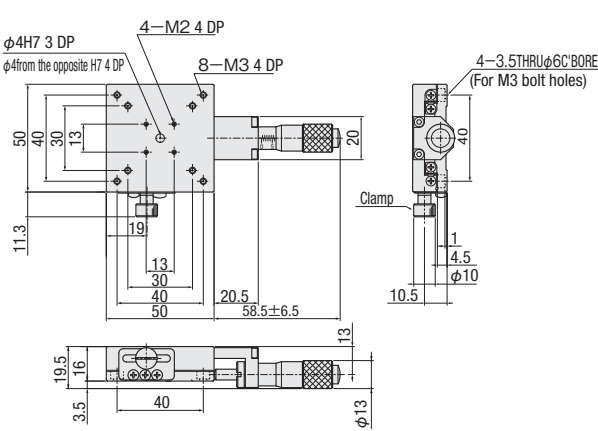
**BSS16-50A**



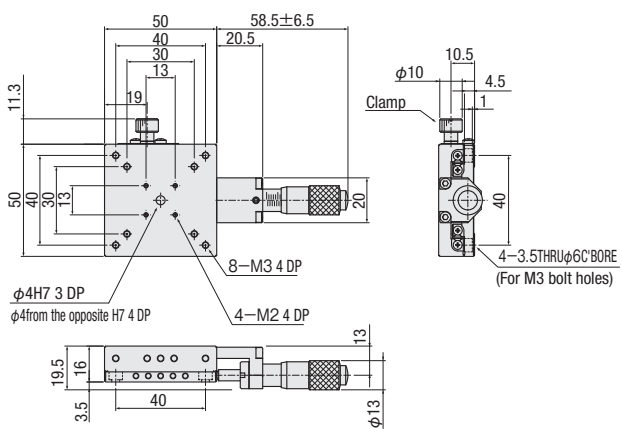
**BSS16-50AR**



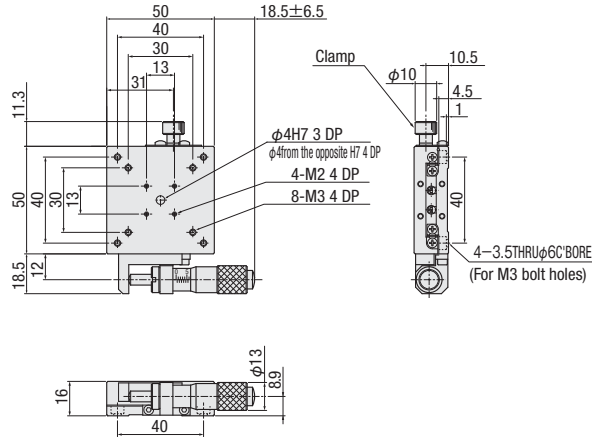
**BSS16-50AZ**



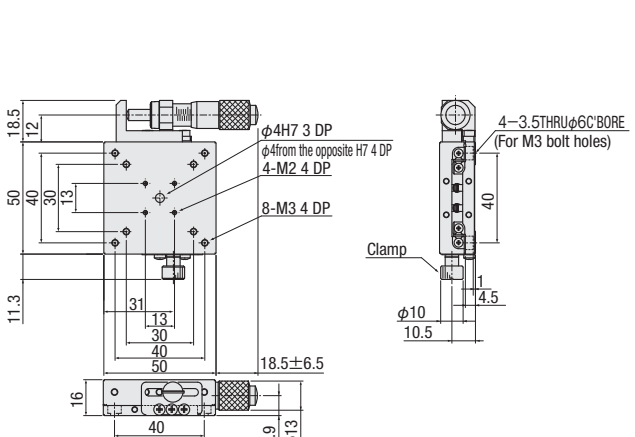
**BSS16-50AZR**



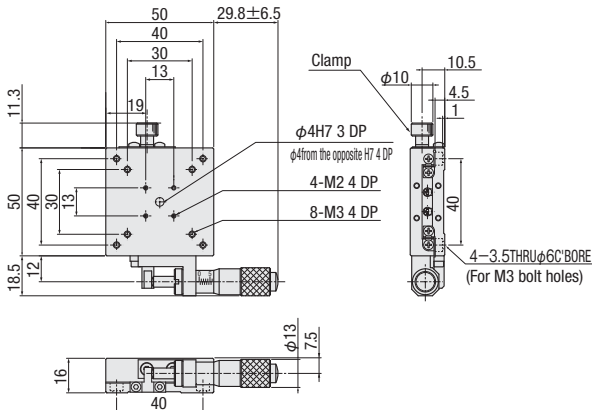
**BSS16-50C**



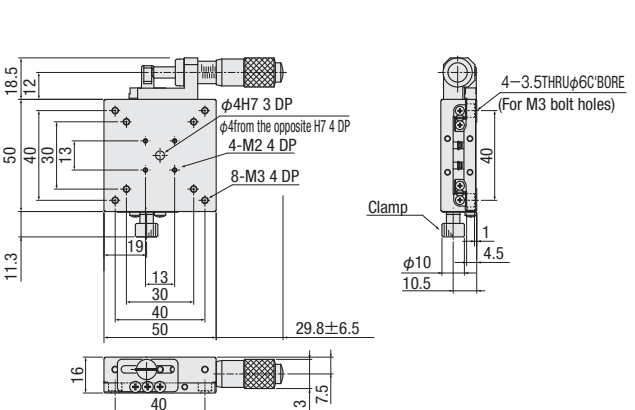
**BSS16-50CR**



**BSS16-50CZ**



**BSS16-50CZR**





## X-axis Linear Ball Guide (SS) Stage □60: BSS16-60/BSB16-60

BSS16-60C



BSB16-60C



Low prices

Linear ball guide  
BXT series



▶ P.2-015~

RoHS

Optional sample \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. ▶ P.2-009

Precise positioning

Coarse-fine micrometer



Cost reduction

Feeding screw



Prevention error · Space-saving

Feeding screw hexagonal wrench operation



Reduce the reading time

Degimatic micro



Improve the fixing accuracy

Disk clamp



Improve the holding power

Opposite clamp



※Image is for □60.

1 Model

# BSS16-60

# BSB16-60CR

Option code



Select the option code as below.

	2 Feeding position		3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)						5 Clamp type			6 Grease specification			
Specification	Standard micro A	Coarse-fine micro B	Standard C	Opposite attached micrometer D	Vertically attached micrometer E	Up/Down-Left/Right opposite F	Standard micro (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic Micrometer	Standard clamp	Disk clamp	Opposite clamp	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	1	FP	LP	SH	FH	4	Blank	5	6	Blank	J	L

⚠ A color of the parts may be silver due to the option model.

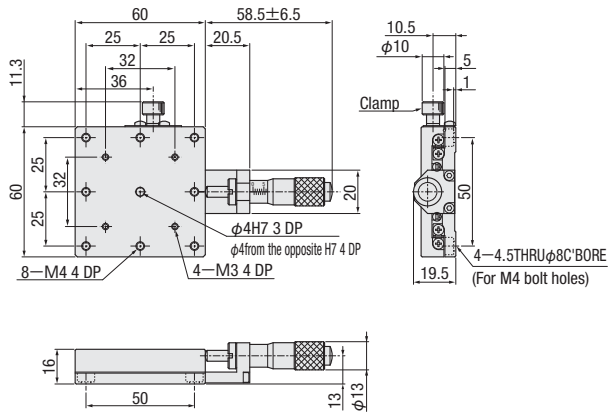
### SPEC

Model	BSS16-60A	BSS16-60AZ	BSS16-60C	BSS16-60CZ	BSB16-60A	BSB16-60AZ	BSB16-60C	BSB16-60CZ
(Opposite hand)	BSS16-60AR	BSS16-60AZR	BSS16-60CR	BSS16-60CZR	BSB16-60AR	BSB16-60AZR	BSB16-60CR	BSB16-60CZR
Stage table size	60×60mm							
Feeding position	Center		Side		Center		Side	
Travel distance	±6.5mm							
Minimum reading of micrometer	10μm							
Guide	Linear ball guide							
Load capacity	20kgf [196N]							
Travel accuracy	Straightness		Within 1μm				Within 3μm	
	Pitching				Within 25"			
	Yawing				Within 15"			
Allowable load for moment	Pitch		10.0N · m					
	Yaw		10.0N · m					
	Roll		9.0N · m					
Moment rigidity	Pitch		0.08"/N · cm					
	Yaw		0.08"/N · cm					
	Roll		0.05"/N · cm					
Parallelism	Within 15μm							
Motion parallelism	Within 7μm							
Weight	0.4kg							
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating			
Provided screws (Hex socket screws)	4 of M4—6							

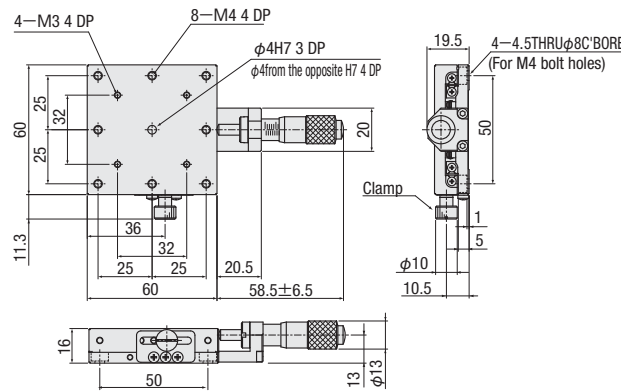
**Dimensional outline drawings**

☉ The center hole tolerance H8 for BSB.

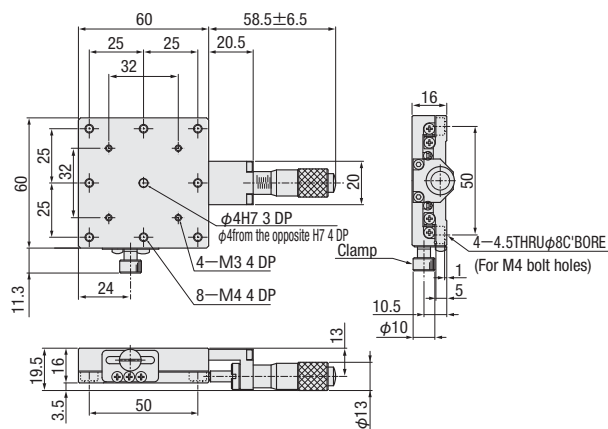
**BSS16-60A/BSB16-60A**



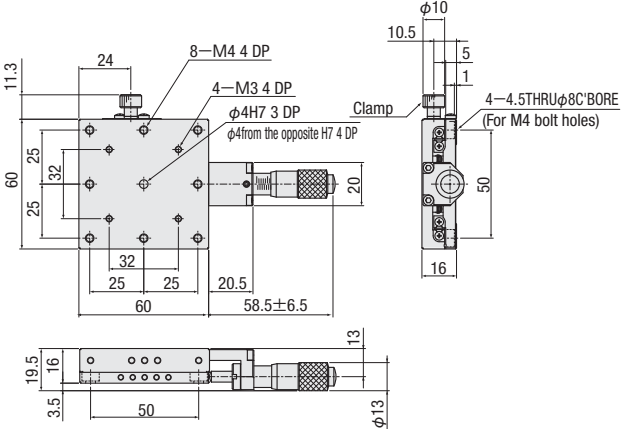
**BSS16-60AR/BSB16-60AR**



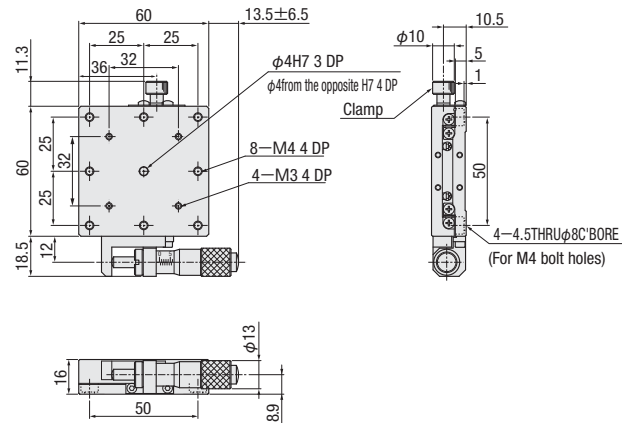
**BSS16-60AZ/BSB16-60AZ**



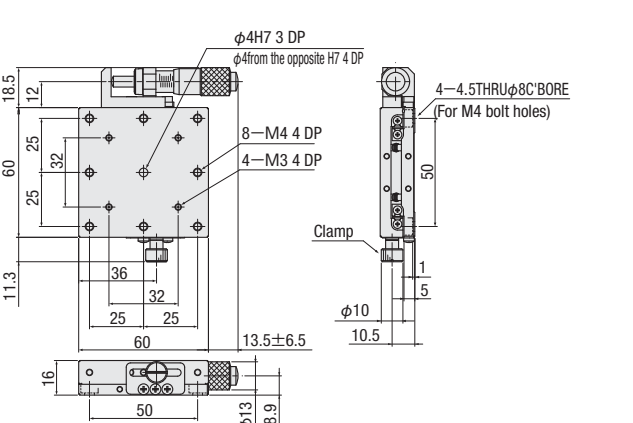
**BSS16-60AZR/BSB16-60AZR**



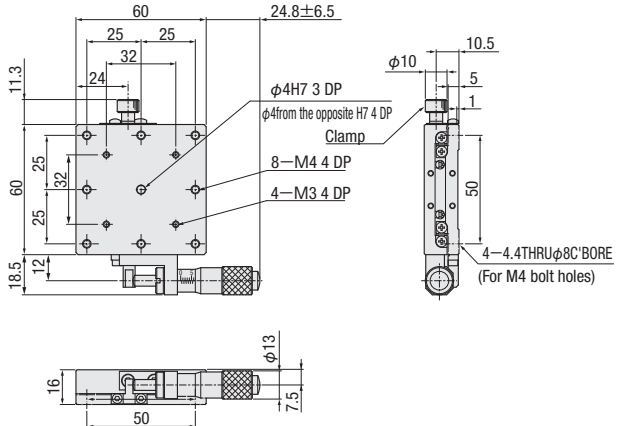
**BSS16-60C/BSB16-60C**



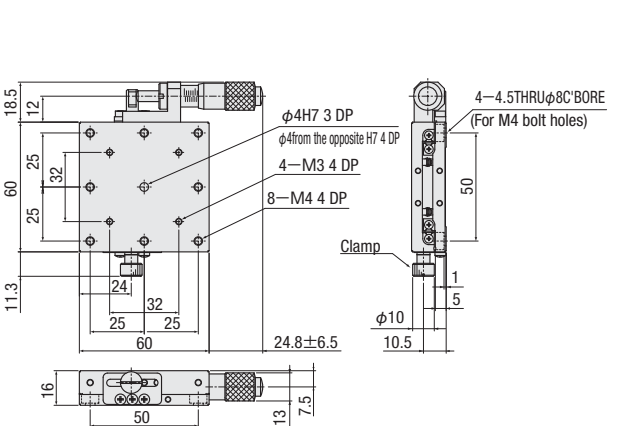
**BSS16-60CR/BSB16-60CR**



**BSS16-60CZ/BSB16-60CZ**



**BSS16-60CZR/BSB16-60CZR**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

024

## X-axis Linear Ball Guide (SS) Stage □70: BSS16-70

BSS16-70C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. [OP.2-009](#)~

**Precise positioning**

Coarse-fine micrometer



**Cost reduction**

Feeding screw



**Prevention error · Space-saving**

Feeding screw hexagonal wrench operation



**Reduce the reading time**

Degimatic micrometer



**Improve the fixing accuracy**

Disk clamp



**Improve the holding power**

Opposite clamp



※Image is for □80.

1 Model

Option code

**BSS16-70CR** □ □ - □ □

Select the option code as below.

Specification	2 Feeding position		3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)						5 Clamp type			6 Grease specification			
	Standard micrometer A	Coarse-fine micrometer B	Standard	Opposite attached micrometer	Vertically attached micrometer	Up/Down-Left/Right opposite	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic Micrometer	Standard clamp	Disk clamp	Opposite clamp	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	1	FP	LP	SH	FH	4	Blank	5	6	Blank	J	L

		SPEC			
Model		BSS16-70A	BSS16-70AZ	BSS16-70C	BSS16-70CZ
<b>(Opposite hand)</b>		BSS16-70AR	BSS16-70AZR	BSS16-70CR	BSS16-70CZR
Stage table size		70×70mm			
Feeding position		Center		Side	
Travel distance		±6.5mm			
Minimum reading of micrometer		10μm			
Guide		Linear ball guide			
Load capacity		23kgf [225.4N]			
Travel accuracy	Straightness	Within 1μm			
	Pitching	Within 25"			
	Yawing	Within 15"			
Allowable load for moment	Pitch	13.8N · m			
	Yaw	13.8N · m			
	Roll	12.9N · m			
Moment rigidity	Pitch	0.06"/N · cm			
	Yaw	0.05"/N · cm			
	Roll	0.03"/N · cm			
Parallelism		Within 15μm			
Motion parallelism		Within 7μm			
Weight		0.58kg			
Main material—Surface finishing		Stainless—Electroless nickel plating			
Provided screws (Hex socket screws)		4 of M4—6			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

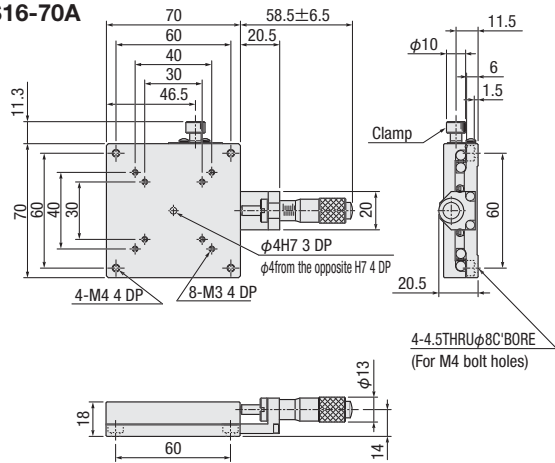
□100

□120

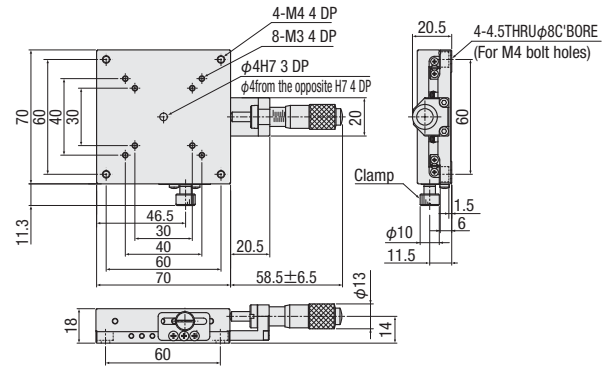
Other

Dimensional outline drawings

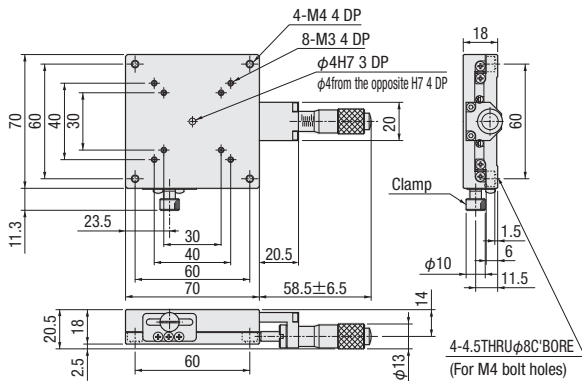
BSS16-70A



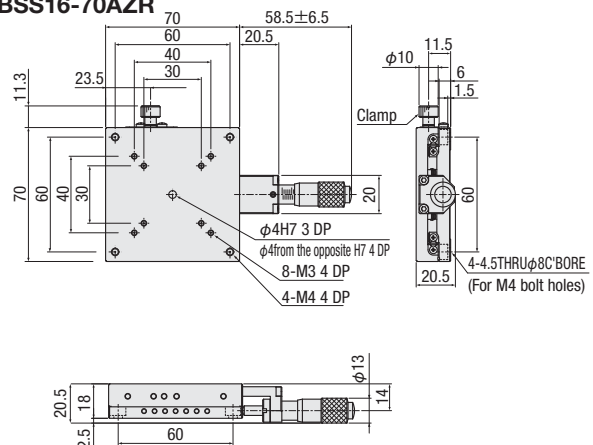
BSS16-70AR



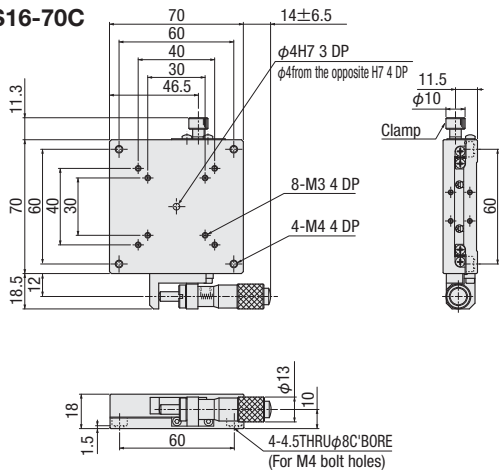
BSS16-70AZ



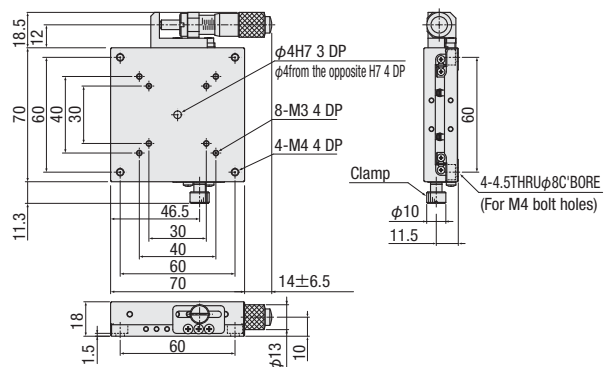
BSS16-70AZR



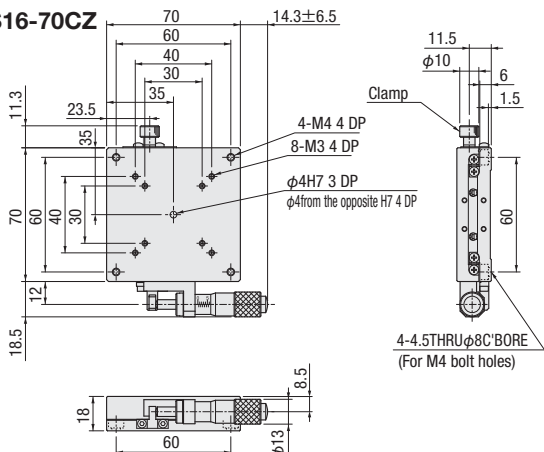
BSS16-70C



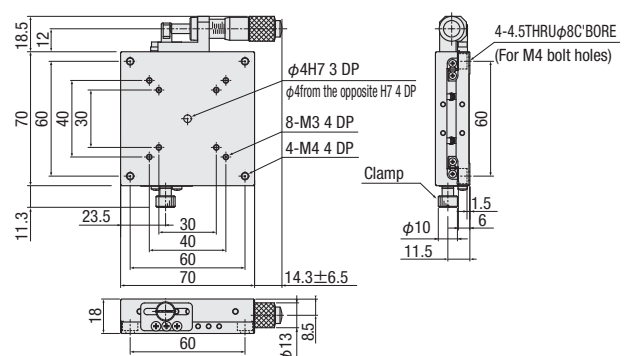
BSS16-70CR



BSS16-70CZ



BSS16-70CZR



# Manual Stage

## X-axis Linear Ball Guide (SS) Stage □80: BSS16-80/BSB16-80

Manual linear stage

BSS16-80C

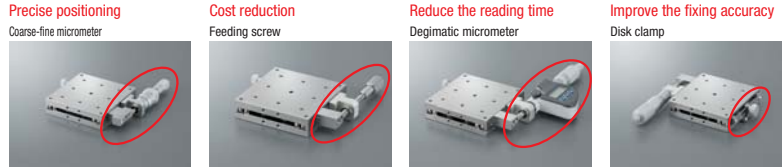


BSB16-80C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. **OP.2-009~**



1 Model



Select the option code as below.

	2 Feeding position		3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)				5 Clamp type		6 Grease specification		
Specification	Standard micrometer A 	Coarse-fine micrometer B 	Standard 	Opposite attached micrometer 	Vertically attached micrometer 	Up/Down-Left/Right opposite 	Standard micrometer (P=0.5mm) 	Feeding screw (Knob) (P=0.5mm) 	Feeding screw (Knob) (P=1.0mm) 	Degimatic Micrometer 	Standard clamp 	Disk clamp 	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	TP	GP	4	Blank	5	Blank	J	L

⊕ A color of the parts may be silver due to the option model.

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

### SPEC

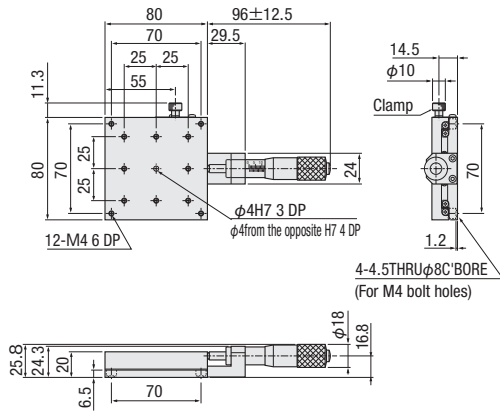
Model	BSS16-80A	BSS16-80AZ	BSS16-80C	BSS16-80CZ	BSB16-80A	BSB16-80AZ	BSB16-80C	BSB16-80CZ
(Opposite hand)	BSS16-80AR	BSS16-80AZR	BSS16-80CR	BSS16-80CZR	BSB16-80AR	BSB16-80AZR	BSB16-80CR	BSB16-80CZR
Stage table size	80×80mm							
Feeding position	Center				Side			
Travel distance	±12.5mm							
Minimum reading of micrometer	10μm							
Guide	Linear ball guide							
Load capacity	27.0kgf [264.6N]							
Travel accuracy	Straightness			Within 3μm				
	Pitching			Within 25"				
	Yawing			Within 15"				
Allowable load for moment	Pitch			18.2N · m				
	Yaw			18.2N · m				
	Roll			17.7N · m				
Moment rigidity	Pitch			0.04"/N · cm				
	Yaw			0.04"/N · cm				
	Roll			0.02"/N · cm				
Parallelism	Within 20μm							
Motion parallelism	Within 8μm							
Weight	0.90kg							
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating			
Provided screws (Hex socket screws)	4 of M4—6							

**Dimensional outline drawings**

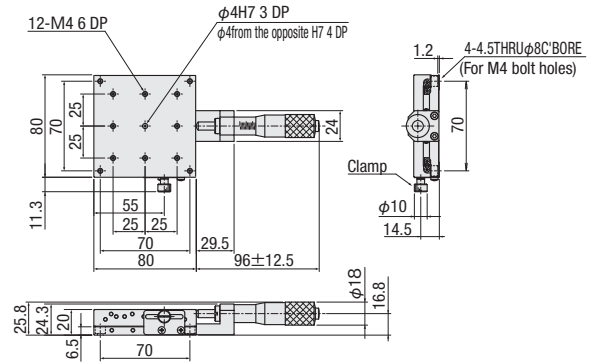
☞The center hole tolerance H8 for BSB



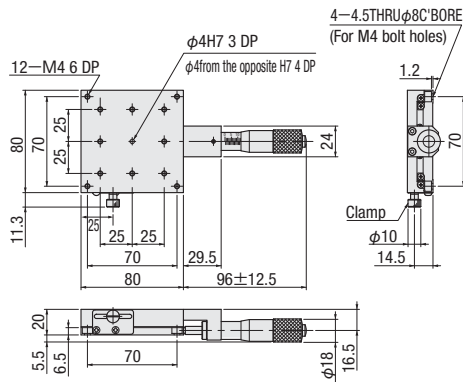
**BSS16-80A/BSB16-80A**



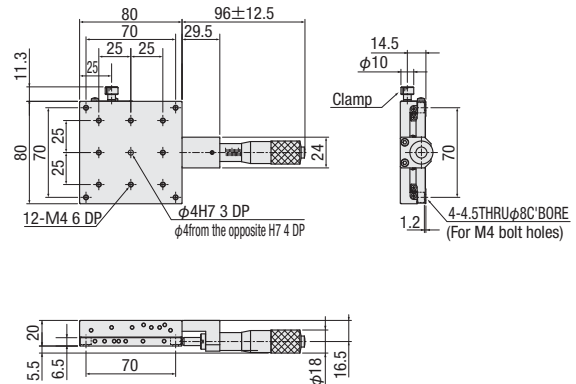
**BSS16-80AR/BSB16-80AR**



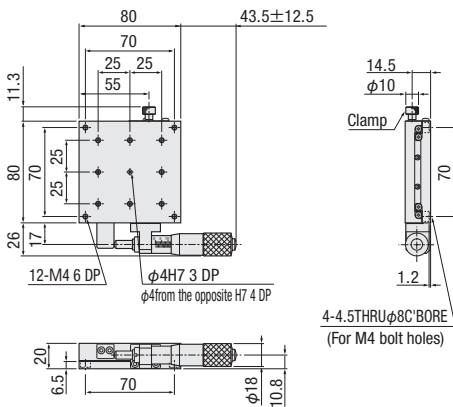
**BSS16-80AZ/BSB16-80AZ**



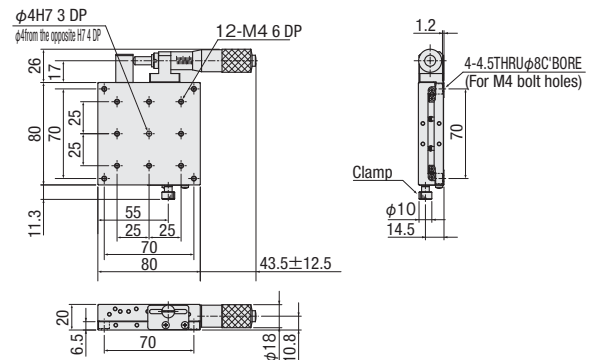
**BSS16-80AZR/BSB16-80AZR**



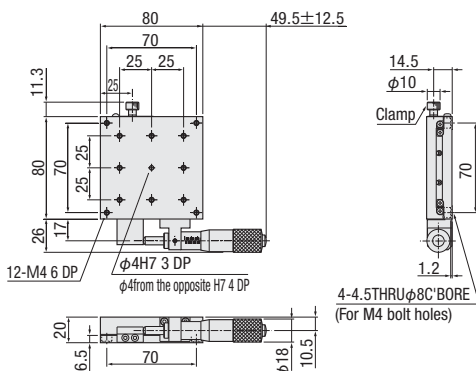
**BSS16-80C/BSB16-80C**



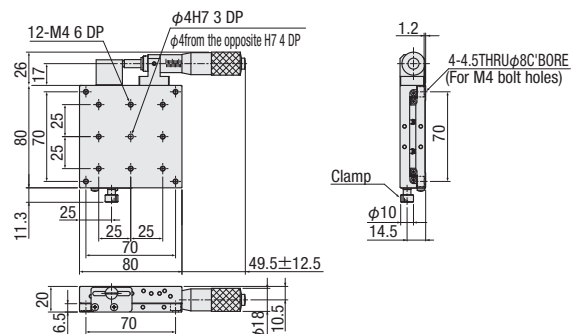
**BSS16-80CR/BSB16-80CR**



**BSS16-80CZ/BSB16-80CZ**



**BSS16-80CZR/BSB16-80CZR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

Dovetail

Dovetail

25

30

40

50

70

80

100

120

Other

2

028

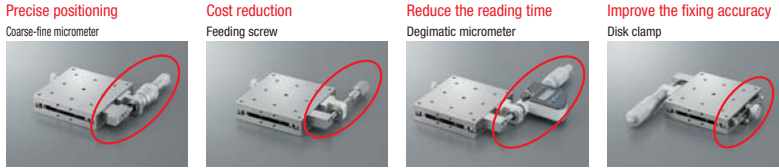
## X-axis Linear Ball Guide (SS) Stage □100: BSS16-100

BSS16-100C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. **OP.2-009~**



**1 Model**      **Option code**

**BSS16-100** **CR**   **-**

2   3   4   5   6

Select the option code as below.

	2 Feeding position		3 Operating position				4 Feeding type (Not available feeding position B/D when selecting)				5 Clamp type		6 Grease specification		
Specification	Standard micrometer A 	Coarse-fine micrometer B 	Standard 	Opposite attached micrometer 	Vertically attached micrometer 	Up/Down-Left/Right opposite 	Standard micrometer (P=0.5mm) 	Feeding screw (Knob) (P=0.5mm) 	Feeding screw (Knob) (P=1.0mm) 	Degimatic Micrometer 	Standard clamp 	Disk clamp 	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	B/D Center/Side	Blank	R	Z	ZR	Blank	TP	GP	4	Blank	5	Blank	J	L

SPEC				
Model	BSS16-100A	BSS16-100AZ	BSS16-100C	BSS16-100CZ
(Opposite hand)	BSS16-100AR	BSS16-100AZR	BSS16-100CR	BSS16-100CZR
Stage table size	100×100mm			
Feeding position	Center		Side	
Travel distance	±12.5mm			
Minimum reading of micrometer	10μm			
Guide	Linear ball guide			
Load capacity	35.0kgf [343N]			
Travel accuracy	Straightness		Within 3μm	
	Pitching		Within 25"m	
	Yawing		Within 15"m	
Allowable load for moment	Pitch		31.8N · m	
	Yaw		31.8N · m	
	Roll		30.7N · m	
Moment rigidity	Pitch		0.02"/N · cm	
	Yaw		0.02"/N · cm	
	Roll		0.01"/N · cm	
Parallelism	Within 20μm			
Motion parallelism	Within 8μm			
Weight	1.33kg			
Main material—Surface finishing	Stainless—Electroless nickel plating			
Provided screws (Hex socket screws)	4 of M4—6			

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

**Linear Ball**

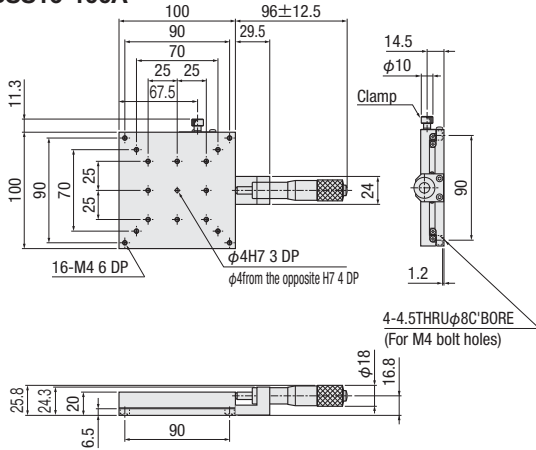
**Cross Roller**

**Dovetail**

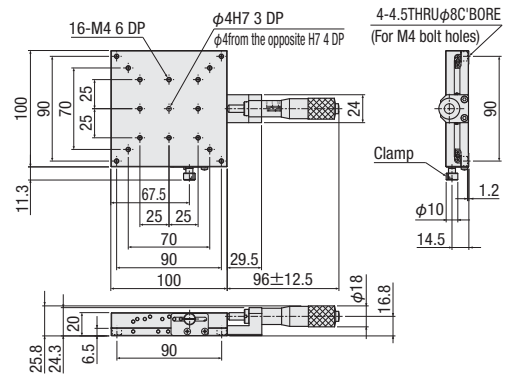
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

Dimensional outline drawings

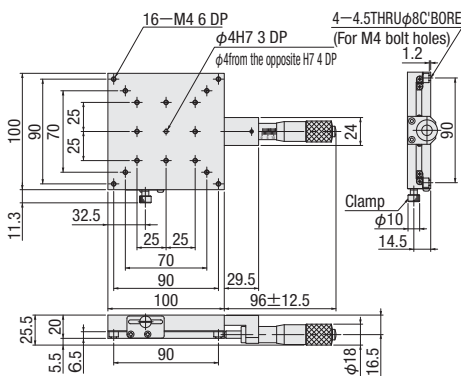
**BSS16-100A**



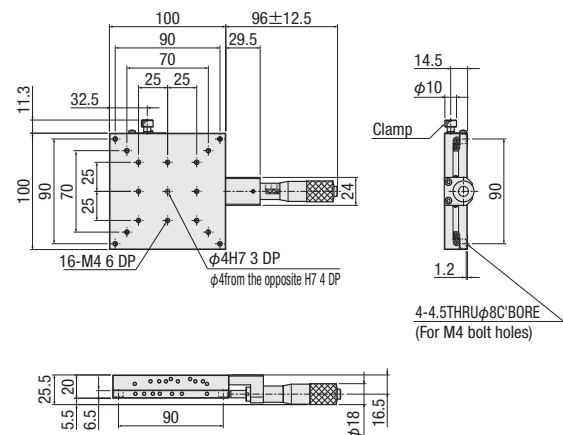
**BSS16-100AR**



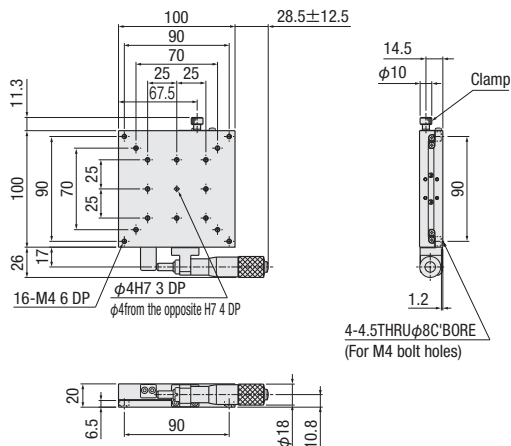
**BSS16-100AZ**



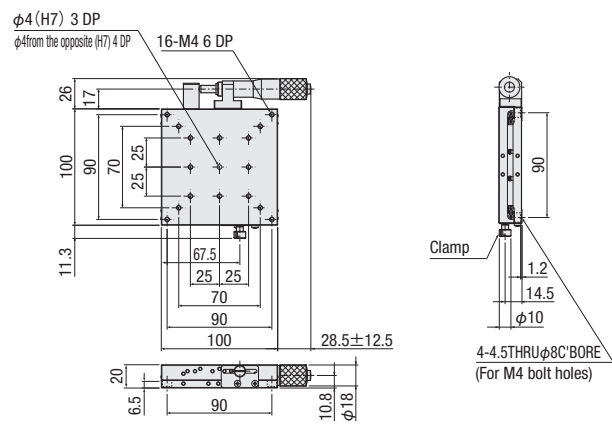
**BSS16-100AZR**



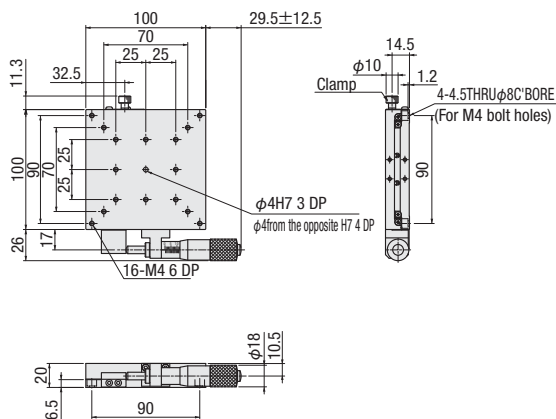
**BSS16-100C**



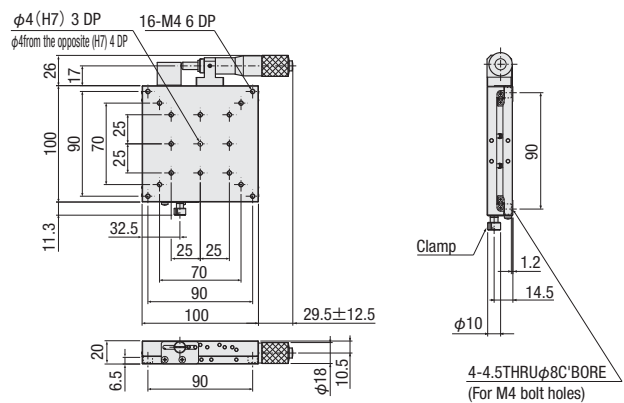
**BSS16-100CR**



**BSS16-100CZ**



**BSS16-100CZR**





## Long Stroke X-axis Linear Ball Guide (SS) Stage: BSL16 (40×80/60×120)

BSL16-4025A



BSL16-4025C



BSL16-6050C



BSL16-4025AGP



BSL16-4025CGP



BSL16-6050CGP

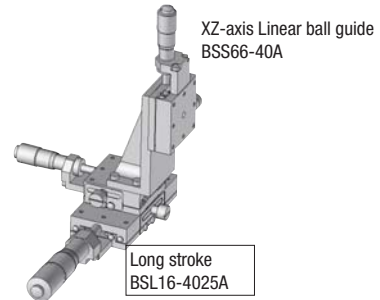


### [Features]

- High precision, high rigidity and thin long stroke models.
- Narrow width in comparison with the square type, and it realize a long stroke operation.
- Selectable micrometer for feeding screw or feedin nut (Lead 1.0mm).
- Superior rust prevention and corrosion resistance by using stainless and electroless nickel for the main body.
- Can be combined with different size stages such as □40, □60mm, and also available combination of different stroke size.

- Stage size: Travel distance
- 40×80mm : ±12.5mm
  - 60×120mm : ±25mm

### [Example of combinations]



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

SPEC						
Model	BSL16-4025A	BSL16-4025AGP	BSL16-4025C	BSL16-4025CGP	BSL16-6050C	BSL16-6050CGP
(Opposite hand)	BSL16-4025AR	BSL16-4025ARGP	BSL16-4025CR	BSL16-4025CRGP	BSL16-6050CR	BSL16-6050CRGP
Stage table size	40×80mm				60×120mm	
Feeding position	Center			Side		
Travel distance	±12.5mm				±25mm	±12.5mm
Travel distance per rotation of feed screw	—	1.0mm	—	1.0mm	—	1.0mm
Minimum reading of micrometer	10μm	—	10μm	—	10μm	—
Guide	Linear ball guide					
Load capacity	15.0kgf [147N]				20.0kgf [196N]	
Travel accuracy	Straightness		Within 3μm			
	Pitching		Within 25"			
	Yawing		Within 15"			
Allowable load for moment	Pitch		6.8N · m		10N · m	
	Yaw		6.8N · m		10N · m	
	Roll		5.0N · m		6.8N · m	
Moment rigidity	Pitch		0.15"/N · cm		0.08"/N · cm	
	Yaw		0.13"/N · cm		0.07"/N · cm	
	Roll		0.25"/N · cm		0.14"/N · cm	
Parallelism	Within 20μm					
Motion parallelism	Within 8μm					
Weight	0.44kg				0.98kg	
Main material—Surface finishing	Stainless—Electroless nickel plating					
Provided screws (Hex socket screws)	4 of M3—6				4 of M4—6	



# Manual Stage

## X-axis SS Stage Operation Side Clamp Type □40/□50/□60/□70: BSS16

Manual linear stage

BSS16-60C7 [Micrometer] BSS16-60C17 [Feeding screw]



RoHS

X

- **Improved operability**  
Put the clamp on the same side of micrometer or feeding knob. Available one way direction operating.

XY

- **Improve the holding power**  
Holding power is higher than standard.  
\* Not available grease option.

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

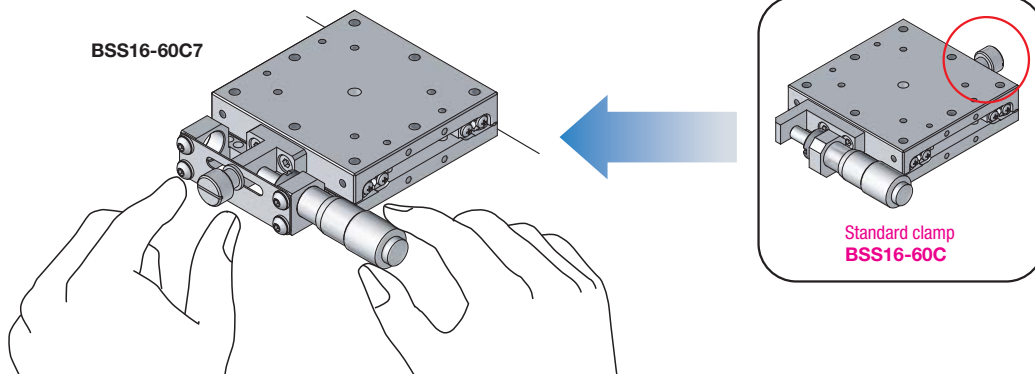
Goniometer

Rotary

Unit

Accessories

- **Easy clamp operation**  
Operation panel side of micrometer and clamp are integrated. It improves the efficiency and space saving.



Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

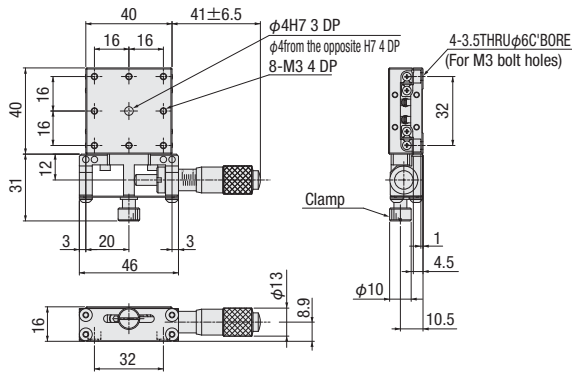
Other

### SPEC

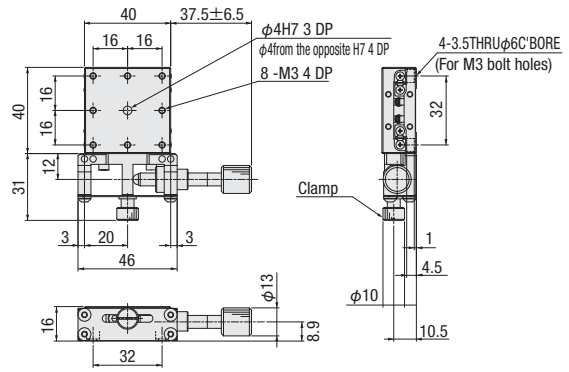
Model	BSS16-40C7	BSS16-40C17	BSS16-50C7	BSS16-50C17	BSS16-60C7	BSS16-60C17	BSS16-70C7	BSS16-70C17
(Opposite hand)	BSS16-40CR7	BSS16-40CR17	BSS16-50CR7	BSS16-50CR17	BSS16-60CR7	BSS16-60CR17	BSS16-70CR7	BSS16-70CR17
Stage table size	40×40mm		50×50mm		60×60mm		70×70mm	
Feeding position	Side							
Travel distance	±6.5mm							
Travel distance per rotation of feed screw	—	0.5mm	—	0.5mm	—	0.5mm	—	0.5mm
Minimum reading of micrometer	10μm	—	10μm	—	10μm	—	10μm	—
Load capacity	10kgf [98N]		15kgf [147N]		20kgf [196N]		23kgf [225.4N]	
Travel accuracy	Straightness							
	Within 1μm							
	Pitching							
Allowable load for moment	Within 25"							
	Yawing							
	Within 15"							
Moment rigidity	Pitch		6.8N · m		10.0N · m		13.8N · m	
	Yaw		6.8N · m		10.0N · m		13.8N · m	
	Roll		6.0N · m		9.0N · m		12.9N · m	
Parallellism	Pitch		0.15"/N · cm		0.08"/N · cm		0.06"/N · cm	
	Yaw		0.14"/N · cm		0.08"/N · cm		0.05"/N · cm	
	Roll		0.09"/N · cm		0.05"/N · cm		0.03"/N · cm	
Motion parallelism								
Within 7μm								
Weight	0.22kg		0.32kg		0.4kg		0.6kg	
Main material—Surface finishing	Stainless—Electroless nickel plating							
Provided screws (Hex socket screws)	4 of M3—6				4 of M4—6			

Dimensional outline drawings

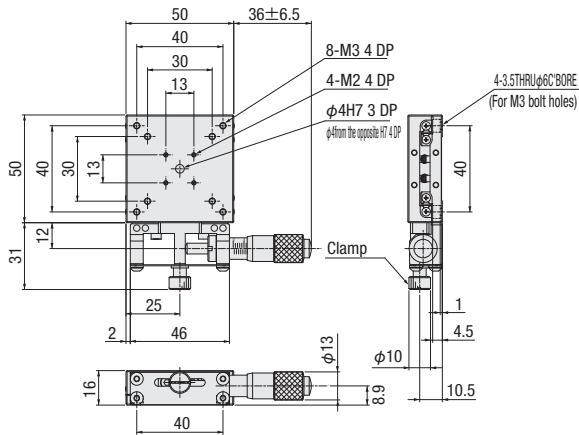
**BSS16-40C7**



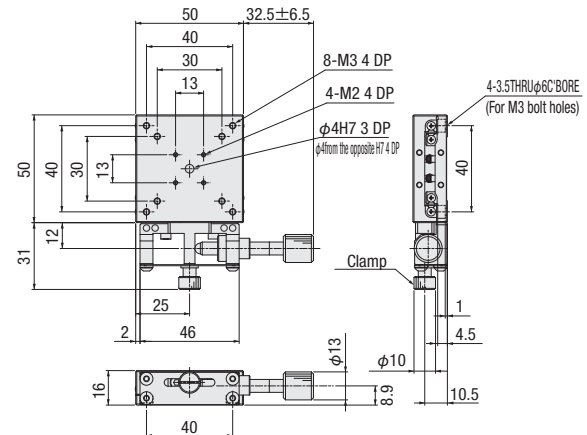
**BSS16-40C17**



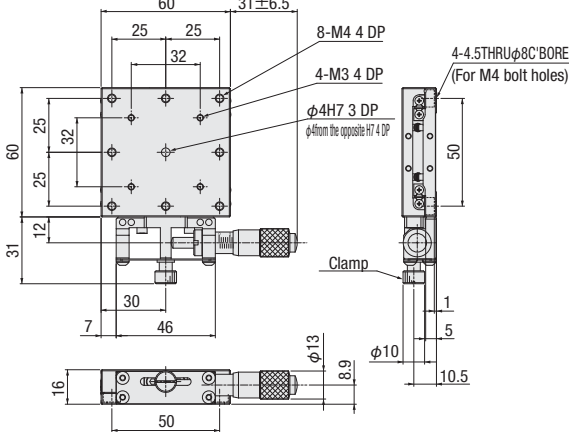
**BSS16-50C7**



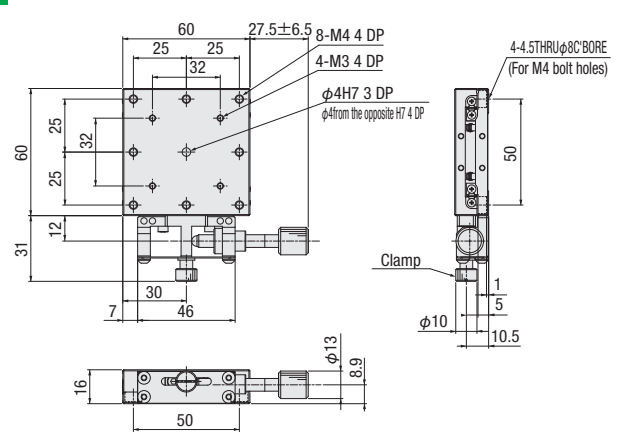
**BSS16-50C17**



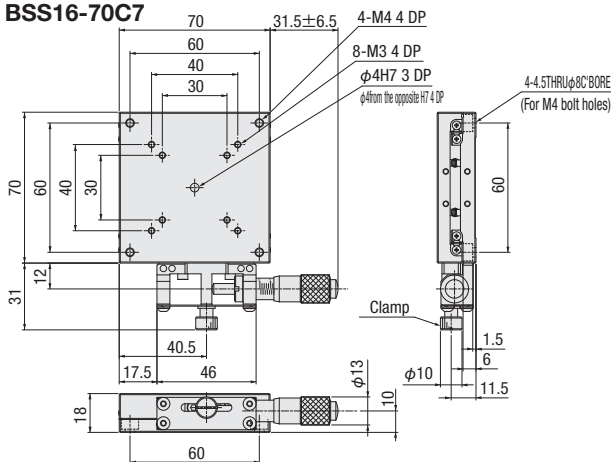
**BSS16-60C7**



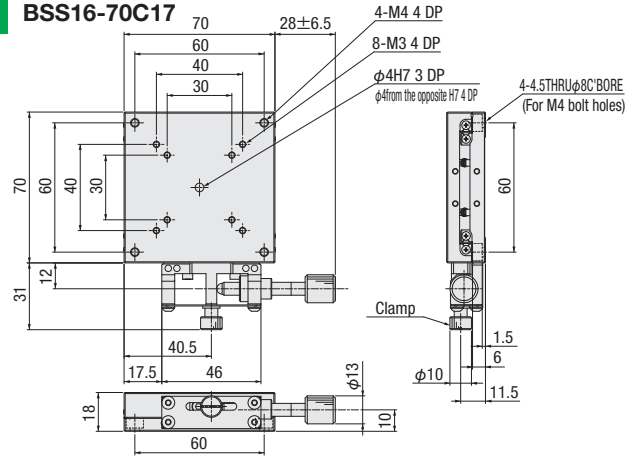
**BSS16-60C17**



**BSS16-70C7**



**BSS16-70C17**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other

2

034

## XY-axis SS Stage Operation Side Clamp Type □40/□50/□60/□70: BSS26

BSS26-60C7 [Micrometer] BSS26-60C17 [Feeding screw]



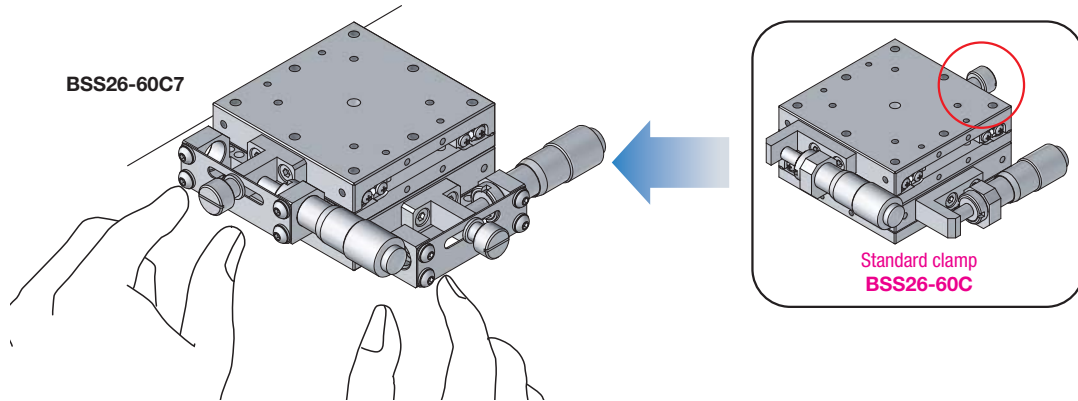
RoHS

- **Improved operability**  
Put the clamp on the same side of micrometer or feeding knob. Available one way direction operating.

- **Improve the holding power**  
Holding power is higher than standard.  
\* Not available grease option.

### ■ Easy clamp operation

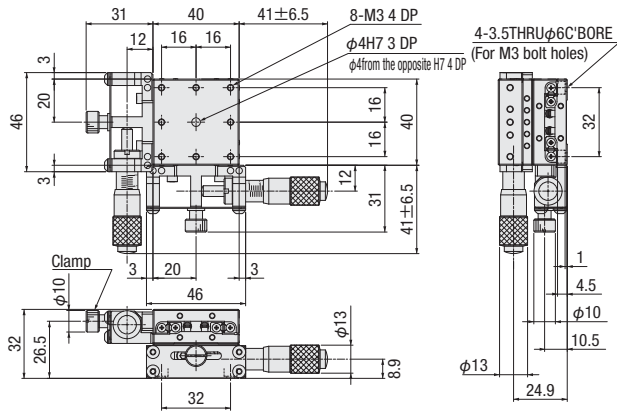
Operation panel side of micrometer and clamp are integrated. It improves the efficiency and space saving.



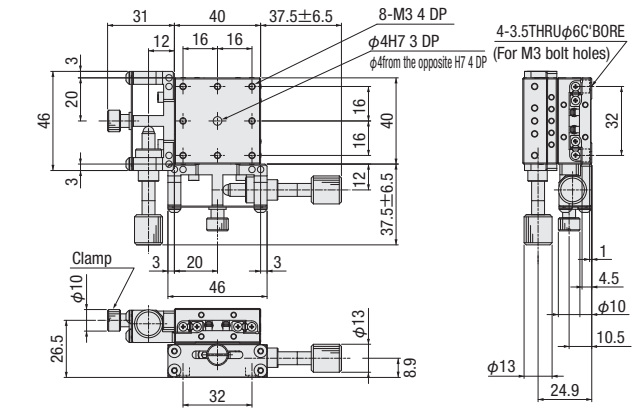
SPEC								
Model	BSS26-40C7	BSS26-40C17	BSS26-50C7	BSS26-50C17	BSS26-60C7	BSS26-60C17	BSS26-70C7	BSS26-70C17
(Opposite hand)	BSS26-40CR7	BSS26-40CR17	BSS26-50CR7	BSS26-50CR17	BSS26-60CR7	BSS26-60CR17	BSS26-70CR7	BSS26-70CR17
Stage table size	40×40mm		50×50mm		60×60mm		70×70mm	
Feeding position	Side							
Travel distance	±6.5mm							
Travel distance per rotation of feed screw	—	0.5mm	—	0.5mm	—	0.5mm	—	0.5mm
Minimum reading of micrometer	10μm	—	10μm	—	10μm	—	10μm	—
Load capacity	9.7kgf [95.2N]		14.7kgf [144.2N]		19.6kgf [192.1N]		22.4kgf [219.7N]	
Travel accuracy	Straightness							
	Within 1μm							
	Pitching							
Allowable load for moment	Within 25°							
	Yawing							
	Within 15°							
Moment rigidity	Pitch		6.0N · m		9.0N · m		12.9N · m	
	Yaw		6.8N · m		10.0N · m		13.8N · m	
	Roll		6.0N · m		9.0N · m		12.9N · m	
Parallellism	Pitch		0.24°/N · cm		0.13°/N · cm		0.09°/N · cm	
	Yaw		0.28°/N · cm		0.16°/N · cm		0.10°/N · cm	
	Roll		0.24°/N · cm		0.13°/N · cm		0.09°/N · cm	
Motion parallellism	Within 30μm							
Squareness	Within 12μm							
Weight	0.46kg		0.66kg		0.82kg		1.22kg	
Main material—Surface finishing	Stainless—Electroless nickel plating							
Provided screws (Hex socket screws)	4 of M3—6				4 of M4—6			

**Dimensional outline drawings**

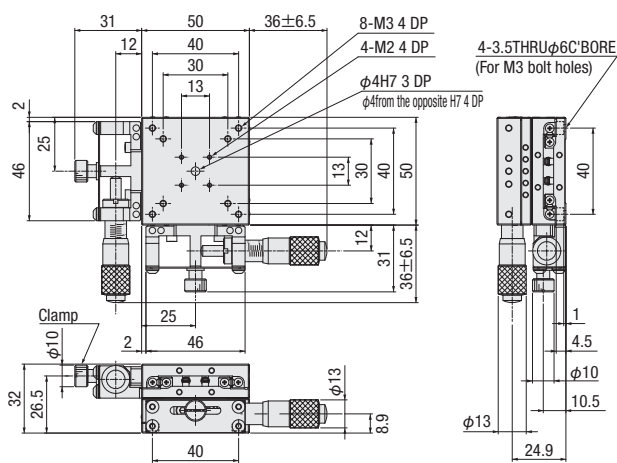
**BSS26-40C7**



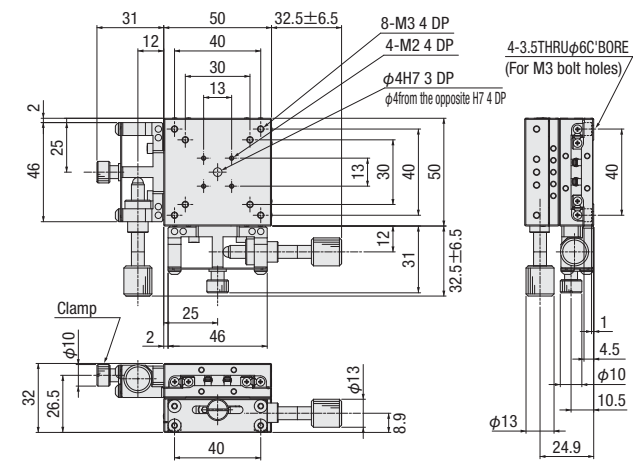
**BSS26-40C17**



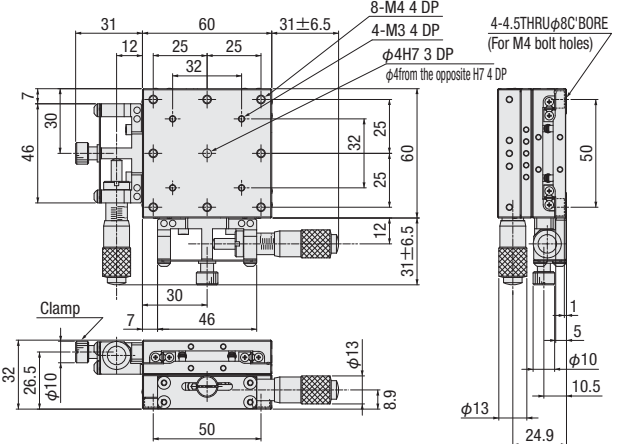
**BSS26-50C7**



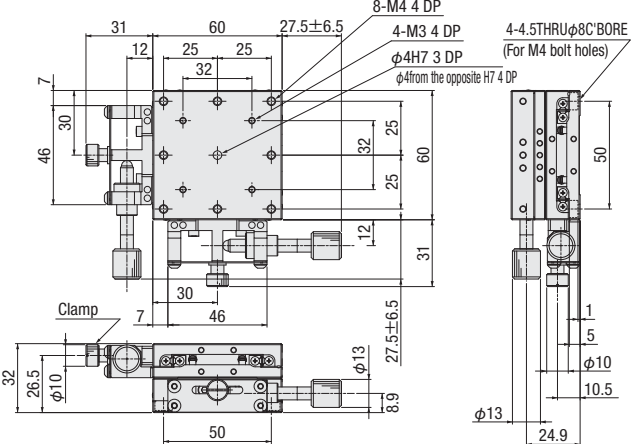
**BSS26-50C17**



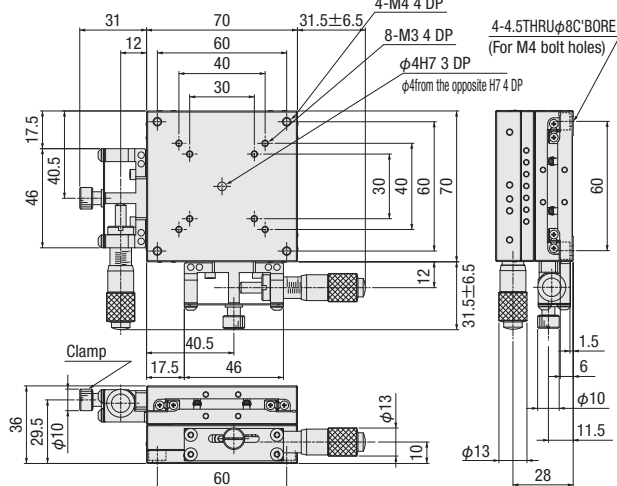
**BSS26-60C7**



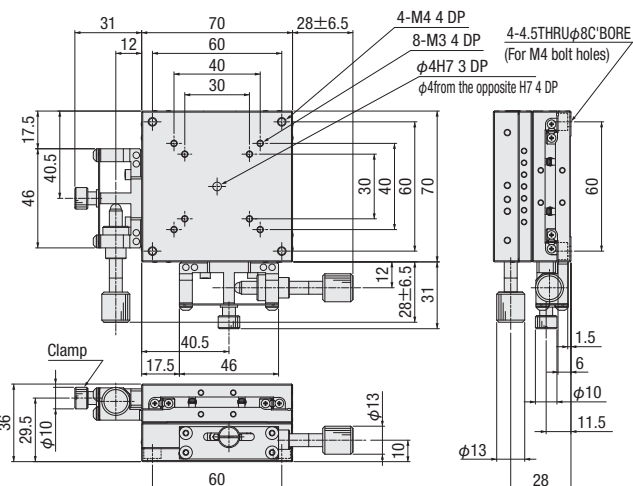
**BSS26-60C17**



**BSS26-70C7**



**BSS26-70C17**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

## X·XY SS Stage Mounting Posture Multi-type □40/□60: BSS16/BSS26

RoHS

BSS16-40CEZ



BSS16-60CEZ



BSS26-40CEZ



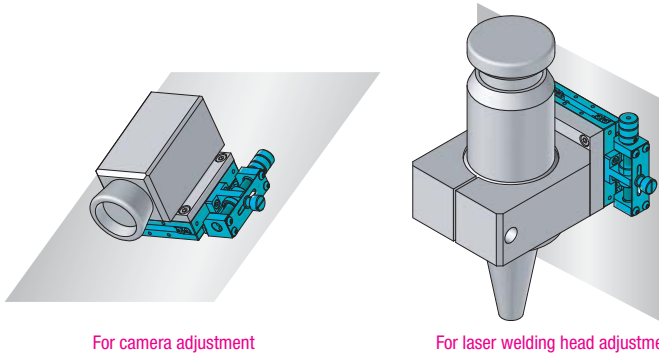
BSS26-60CEZ



- **Available mounting on every direction.**  
Feeding knob is integrated on SS stages.  
Available any design you like.

- **Improve operation**  
Control operation from the one-way direction.  
\* Not available grease option.

■ **Examples of using** Available vertical, horizontal and tilt conditions of variety



For camera adjustment

For laser welding head adjustment

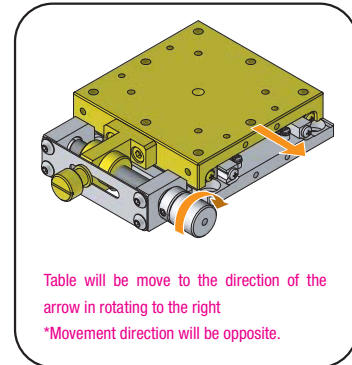


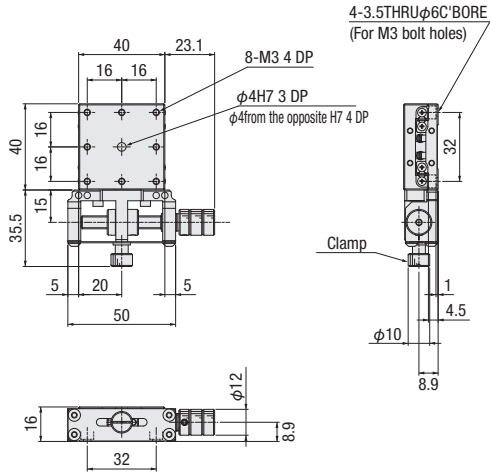
Table will be move to the direction of the arrow in rotating to the right  
\*Movement direction will be opposite.

SPEC					
Axis	X-axis		XY-axis		
Model	BSS16-40CEZ	BSS16-60CEZ	BSS26-40CEZ	BSS26-60CEZ	
(Opposite hand)	BSS16-40CREZ	BSS16-60CREZ	BSS26-40CREZ	BSS26-60CREZ	
Stage table size	40×40mm	60×60mm	40×40mm	60×60mm	
Feeding position	Side				
Travel distance	±6.5mm				
Travel distance per rotation of feed screw	0.5mm				
Minimum reading of micrometer	—				
Load capacity※	10kgf [98N]	20kgf [196N]	9.7kgf [95.2N]	19.6kgf [192.1]	
Travel accuracy	Straightness		Within 1μm		
	Pitching		Within 35"		
	Yawing		Within 25"		
Allowable load for moment	Pitch	5.0N · m	10.0N · m	5.0N · m	
	Yaw	5.0N · m	10.0N · m	10.0N · m	
	Roll	5.0N · m	9.0N · m	5.0N · m	9.0N · m
	Pitch	0.42"/N · cm	0.08"/N · cm	0.63"/N · cm	0.13"/N · cm
Moment rigidity	Yaw	0.35"/N · cm	0.08"/N · cm	0.70"/N · cm	0.16"/N · cm
	Roll	0.21"/N · cm	0.05"/N · cm	0.63"/N · cm	0.13"/N · cm
	Parallelism	Within 15μm		Within 30μm	
Motion parallelism	Within 7μm		Within 12μm		
Squareness	—		Within 10μm		
Weight	0.22kg	0.42kg	0.46kg	0.84kg	
Main material—Surface finishing	Stainless—Electroless nickel plating				
Provided screws (Hex socket screws)	4 of M3—6	4 of M4—6	4 of M3—6	4 of M4—6	

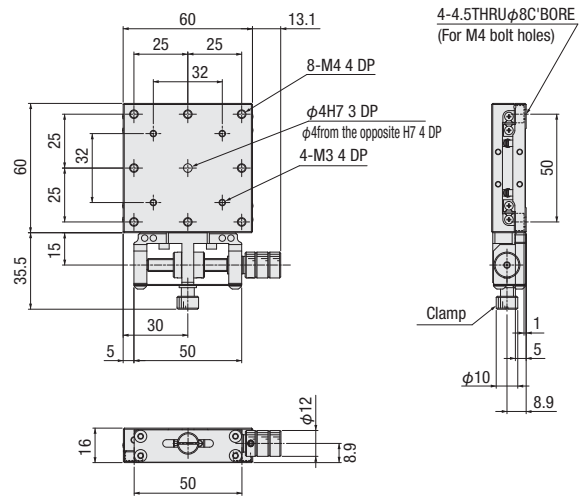
\* The value shows horizontal load capacity(vertical load capacity 5kgf (both of 40×40, 60×60mm))

**Dimensional outline drawings**

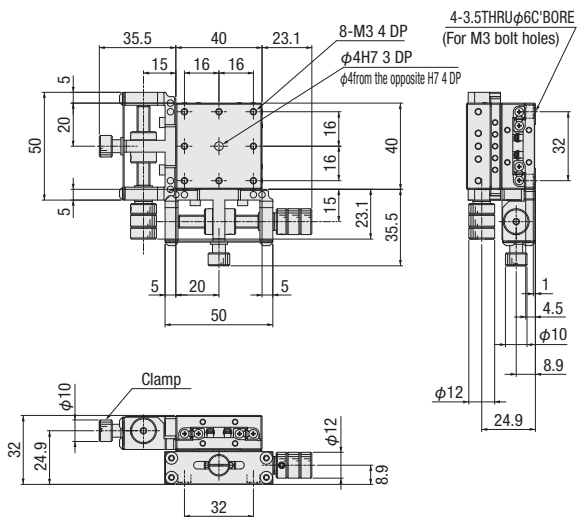
**BSS16-40CEZ**



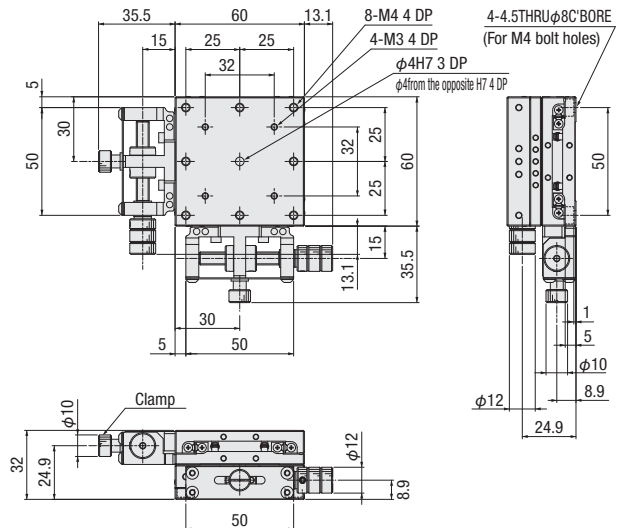
**BSS16-60CEZ**



**BSS26-40CEZ**



**BSS26-60CEZ**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

038



## Thin Type XY-axis Linear Ball Guide (SS) Stage □40~□70: BSS23-40/50/60/70

BSS23-40C



BSS23-60C



**[Features]**

- X and Y-axis integrated structure stage.
- Reduce 10mm of thickness in comparison with XY-axis combination.

RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [▶P.2-009~](#)

**Cost reduction**

Feeding screw

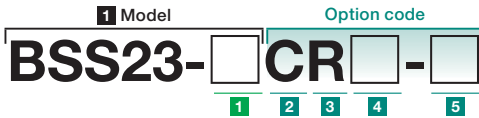


**Prevention error · Space-saving**

Feeding screw hexagonal wrench operation



\*Image is for X-axis.



Select the option code as below.

**1 Stage table size**

40	40×40mm
50	50×50mm
60	60×60mm
70	70×70mm

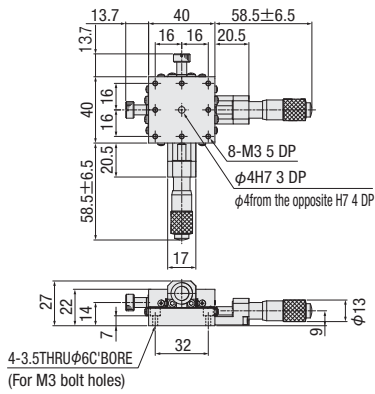
	2 Feeding position		3 Operating position		4 Feeding type (Not available feeding position D when selecting)						5 Grease specification		
Specification	Standard micrometer	Coarse-fine micrometer	Standard	Opposite attached micrometer	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	D Side	Blank	R	Blank	1	FP	LP	SH	FH	Blank	J	L

**SPEC**

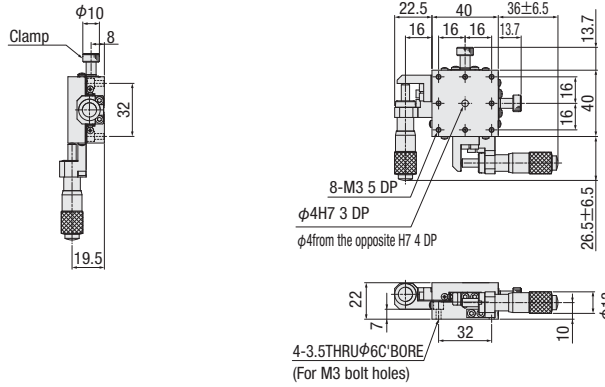
Model	BSS23-40A	BSS23-40C	BSS23-50A	BSS23-50C	BSS23-60A	BSS23-60C	BSS23-70A	BSS23-70C
<b>(Opposite hand)</b>	<b>BSS23-40AR</b>	<b>BSS23-40CR</b>	<b>BSS23-50AR</b>	<b>BSS23-50CR</b>	<b>BSS23-60AR</b>	<b>BSS23-60CR</b>	<b>BSS23-70AR</b>	<b>BSS23-70CR</b>
Stage table size	40×40mm		50×50mm		60×60mm		70×70mm	
Feeding position	Center	Side	Center	Side	Center	Side	Center	Side
Travel distance	±6.5mm							
Minimum reading of micrometer	10μm							
Guide	Linear ball guide							
Load capacity	9.0kgf [88.2N]		14.7kgf [144.1N]		19kgf [186.2N]		22.4kgf [219.5N]	
Travel accuracy	Straightness							
	Pitching							
	Yawing							
Allowable load for moment	Pitch		4.5N · m		9.0N · m		12.4N · m	
	Yaw		5.0N · m		8.1N · m		11.6N · m	
	Roll		4.5N · m		9.0N · m		12.4N · m	
Moment rigidity	Pitch		0.80"/N · cm		0.21"/N · cm		0.12"/N · cm	
	Yaw		0.68"/N · cm		0.19"/N · cm		0.09"/N · cm	
	Roll		0.85"/N · cm		0.20"/N · cm		0.12"/N · cm	
Parallelism	Within 30μm							
Motion parallelism	Within 12μm							
Weight	0.34kg		0.50kg		0.64kg		0.92kg	
Main material—Surface finishing	Stainless—Electroless nickel plating							
Provided screws (Hex socket screws)	4 of M3—10				4 of M4—10			

**Dimensional outline drawings**

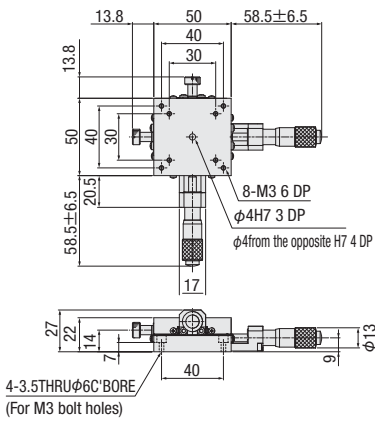
**BSS23-40A**



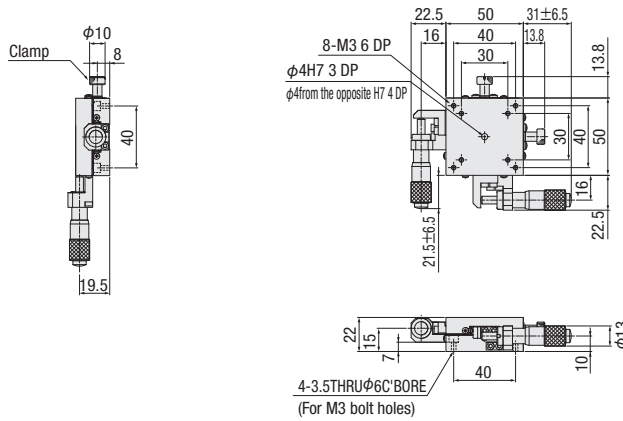
**BSS23-40C**



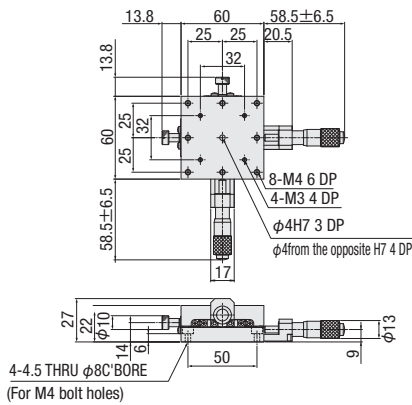
**BSS23-50A**



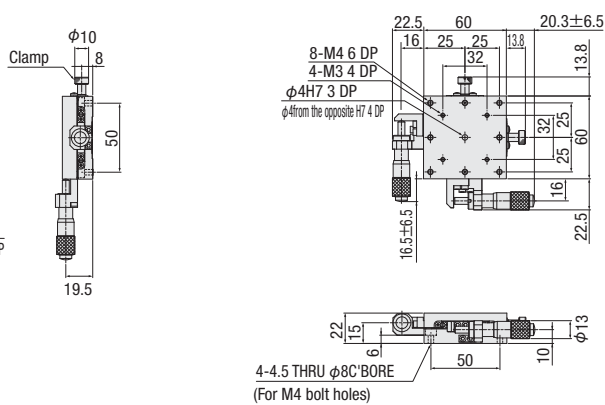
**BSS23-50C**



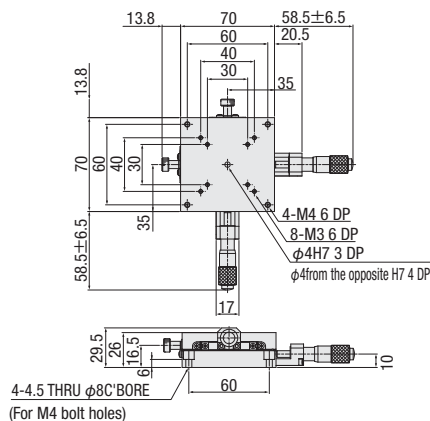
**BSS23-60A**



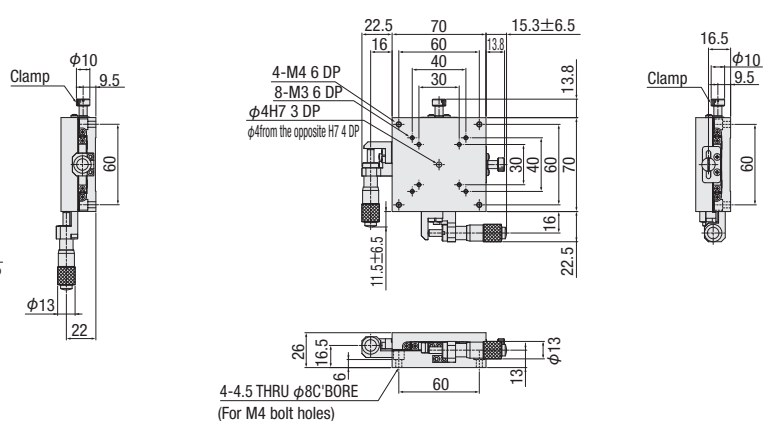
**BSS23-60C**



**BSS23-70A**



**BSS23-70C**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 80

□ 100

□ 120

Other

## Thin Type XY-axis Linear Ball Guide (SS) Stage □80/□100: BSS23-80/100

**BSS23-80C**



**BSS23-100C**



**[Features]**

- X and Y-axis integrated structure stage.
- Reduce 14mm of thickness in comparison with XY-axis combination.

RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [CP.2-009~](#)

**Precise positioning**

Coarse-fine micrometer



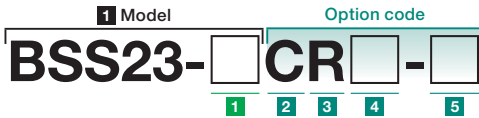
Image is for X-axis.

**Cost reduction**

Feeding screw



Image is for X-axis.



Select the option code as below.

**1 Stage table size**

80	80×80mm
100	100×100mm

	2 Feeding position		3 Operating position		4 Feeding type (Not available feeding position D when selecting)			5 Grease specification		
Specification	Standard micrometer A C	Coarse-fine micrometer D Travel distance: ±5.5mm Minimum reading: 0.5μm	Standard C	Opposite attached micrometer R	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=1.0mm)	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	D Side	Blank	R	Blank	TP	GP	Blank	J	L

		SPEC			
Model		BSS23-80A	BSS23-80C	BSS23-100A	BSS23-100C
(Opposite hand)		BSS23-80AR	BSS23-80CR	BSS23-100AR	BSS23-100CR
Stage table size		80×80mm		100×100mm	
Feeding position		Center	Side	Center	Side
Travel distance		±12.5mm			
Minimum reading of micrometer		10μm			
Guide		Linear ball guide			
Load capacity		26.1kgf [255.8N]		33.6kgf [329.3N]	
Travel accuracy	Straightness	Within 3μm			
	Pitching	Within 40"			
	Yawing	Within 20"			
Allowable load for moment	Pitch	16.4N · m		27.6N · m	
	Yaw	15.9N · m		28.6N · m	
	Roll	16.4N · m		27.6N · m	
	Pitch	0.09"/N · cm		0.06"/N · cm	
Moment rigidity	Yaw	0.06"/N · cm		0.03"/N · cm	
	Roll	0.08"/N · cm		0.06"/N · cm	
	Pitching	Within 40μm			
Motion parallelism		Within 15μm			
Weight		1.32kg		2.66kg	
Main material—Surface finishing		Stainless—Electroless nickel plating			
Provided screws (Hex socket screws)		4 of M4—10			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

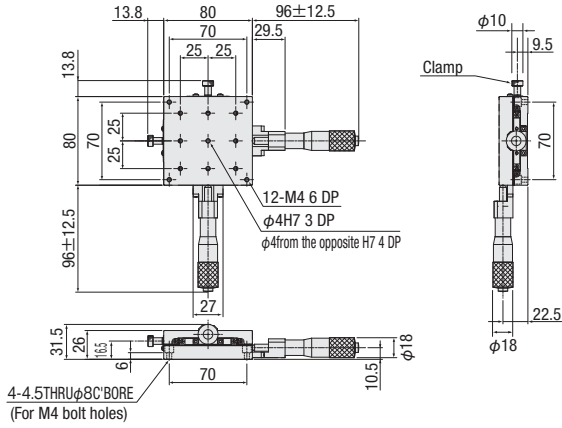
Other

2

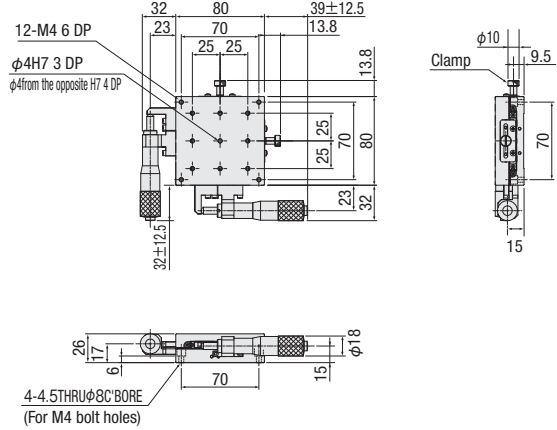
041

**Dimensional outline drawings**

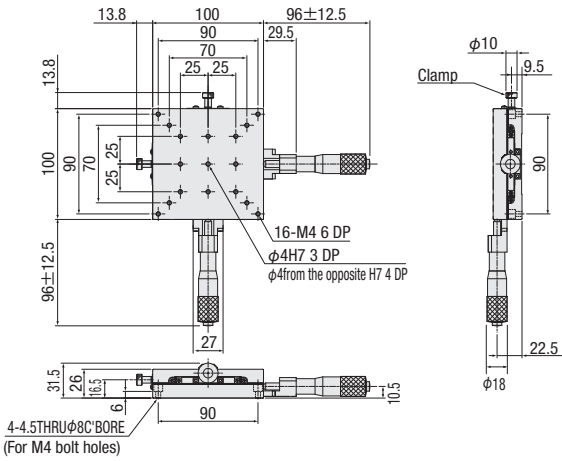
**BSS23-80A**



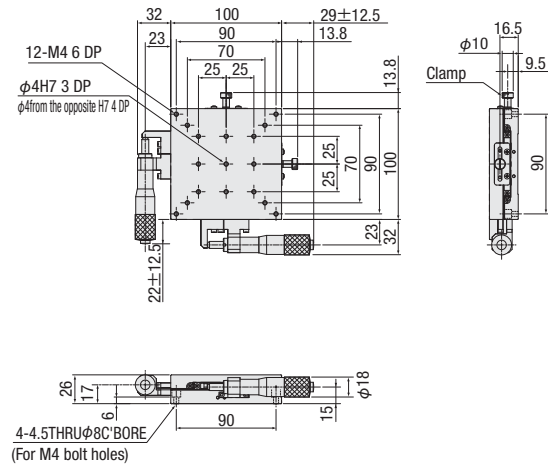
**BSS23-80C**



**BSS23-100A**



**BSS23-100C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

042

## XY-axis Linear Ball Guide BYT Series □40□60: BYT04013/BYT06013

RoHS



BYT04013-CL



BYT06013-CL

**1** Model  
**BYT04013-CL**  
Option code

**1** Stage table size

04	40mm
06	60mm

**2** Travel distance

013	13mm
-----	------

**3** Operating position

L	L opposite hand
R	Opposite hand

SPEC		
Model	BYT04013	BYT06013
Stage table size	40×40mm	60×60mm
Operation position	Side	Side
Travel distance	±6.5mm	±6.5mm
Travel distance per rotation of feed screw	0.5mm	0.5mm
Minimum reading of micrometer	10μm	10μm
Travel guide	Linear ball guide	Linear ball guide
Load capacity	9.8kgf [95.6N]	19.6kgf [191.6N]
Travel accuracy	Straightness (Single axis accuracy)	10μm
	Pitching (Single axis accuracy)	30"
	Yawing (Single axis accuracy)	25"
Moment rigidity	Pitch	0.59"/N · cm
	Yaw	0.70"/N · cm
	Roll	0.59"/N · cm
Parallelism	60μm	60μm
Weight	0.48kg	0.88kg
Main material—Surface finishing	Steel—Electroless nickel plating	Steel—Electroless nickel plating
Provided screws (Hex socket screws)	4 of M3—8	4 of M4—8

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

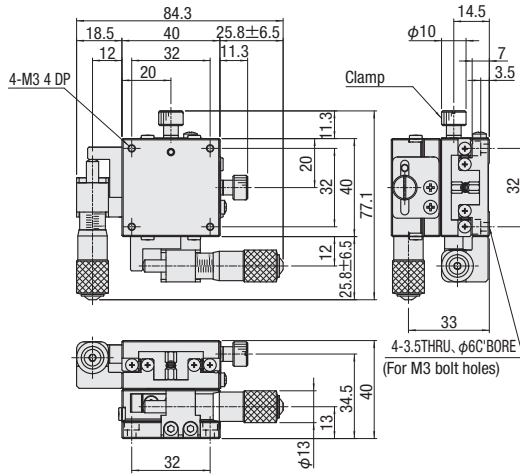
□100

□120

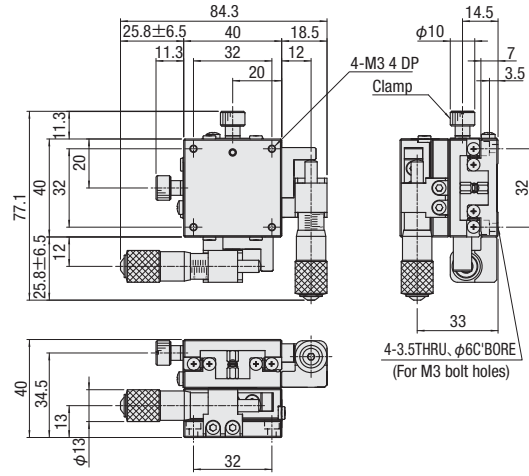
Other

Dimensional outline drawings

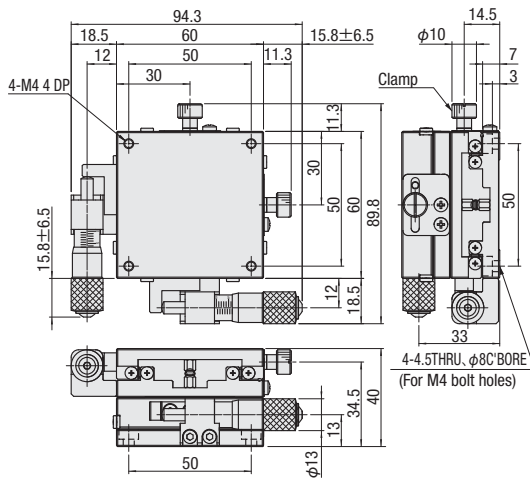
**BYT04013-CL**



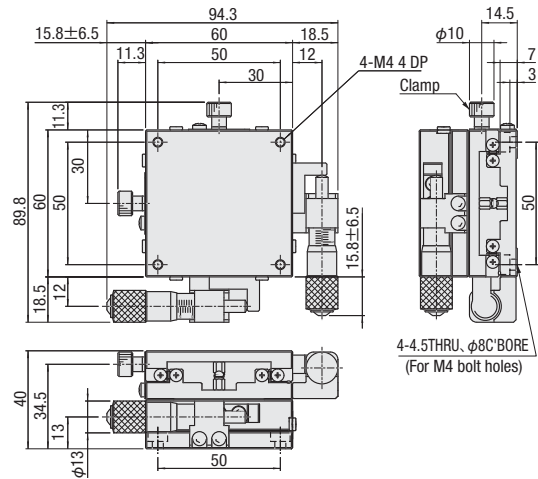
**BYT04013-CR**



**BYT06013-CL**



**BYT06013-CR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

## XY-axis Linear Ball Guide (SS) Stage □25: BSS26-25/BSB26-25

BSS26-25C



BSB26-25C



**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [CP.2-009~](#)

**Cost reduction**  
Feeding screw



**Prevention error · Space-saving**  
Feeding screw hexagonal wrench operation



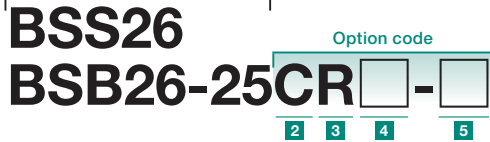
\*Image is for X-axis.

**Configuration**

Model	BSS (BSB) 26-	25A	25C	Reference page
X,Y	BSS (BSB) 16-	25A	25C	<a href="#">CP.2-017~</a>

\* Combination is model of BSS or BSB.  
\* R (opposite-hand) means configuration for X or Y axis of R.

**1 Model**



Select the option code as below.

	2 Feeding position	3 Operating position		4 Feeding type				5 Grease specification			
Specification	Standard micrometer A C	Standard C	Opposite attached micrometer C	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Code	A/C Center/Side	Blank	R	Blank	1	FP	SH	FH	Blank	J	L

\* A color of the parts may be silver due to the option model.

SPEC				
Model	BSS26-25A	BSS26-25C	BSB26-25A	BSB26-25C
(Opposite hand)	BSS26-25AR	BSS26-25CR	BSB26-25AR	BSB26-25CR
Stage table size	25×25mm			
Feeding position	Center	Side	Center	Side
Travel distance	±3.2mm			
Minimum reading of micrometer	10μm			
Guide	Linear ball guide			
Load capacity	3.9kgf [38.2N]			
Travel accuracy	Straightness		Within 3μm	
	Pitching		Within 30"	
	Yawing		Within 25"	
Allowable load for moment	Pitch		2.0N·m	
	Yaw		2.0N·m	
	Roll		3.5N·m	
Moment rigidity	Pitch		3.0"/N·cm	
	Yaw		2.2"/N·cm	
	Roll		2.2"/N·cm	
Parallelism	Within 30μm			
Motion parallelism	Within 10μm			
Squareness	Within 10μm			
Weight	0.14kg			
Main material—Surface finishing	Stainless—Electroless nickel plating		Stainless—Low temperature black chrome plating	
Provided screws (Hex socket screws)	4 of M2—4			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

**Dimensional outline drawings**

Center bore tolerance H7 will be H8 in BSB.



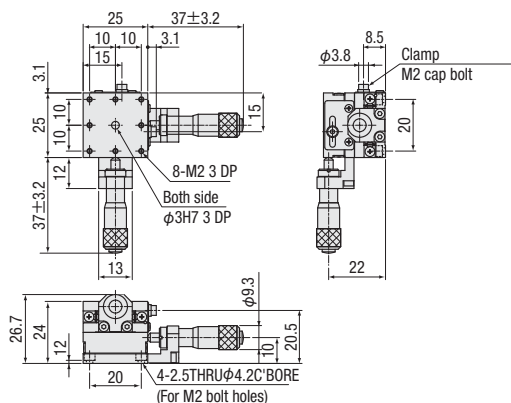
CAD COMMUNITY

CAD DATA

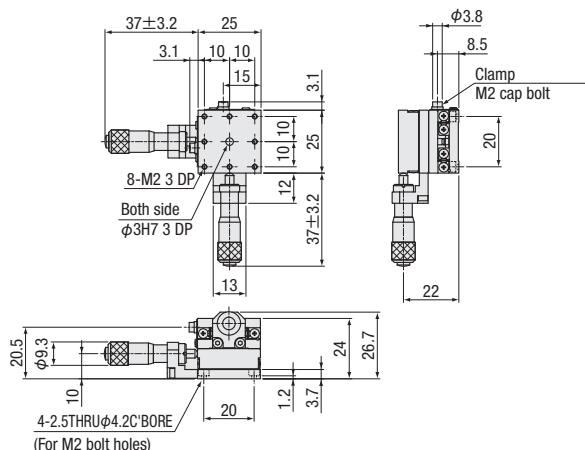


CAD 3D-2D

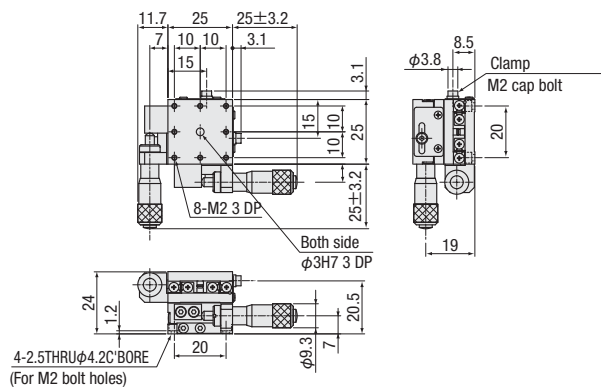
**BSS26-25A/BSB26-25A**



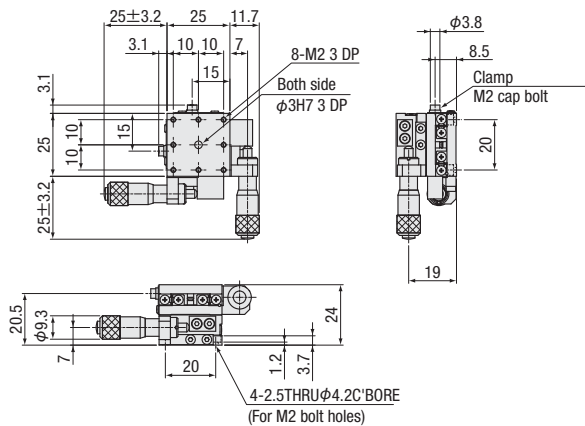
**BSS26-25AR/BSB26-25AR**



**BSS26-25C/BSB26-25C**



**BSS26-25CR/BSB26-25CR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other



## XY-axis Linear Ball Guide (SS) Stage □40/□50: BSS26-40/50/BSB26-40

BSS26-40C



BSB26-40C



Low prices

Linear ball guide  
BYT series



▶ P.2-043~

RoHS

Optional sample \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. ▶ P.2-009~

Precise positioning

Coarse-fine micrometer



\*Minimum scale 0.5μm.  
\*Image is for X-axis.

Cost reduction

Feeding screw



Prevention error · Space-saving

Feeding screw hexagonal wrench operation



\*Image is for X-axis.

Reduce the reading time

Degimatic micrometer



\*Image is for X-axis □80.

Improve the fixing accuracy

Disk clamp



\*Image is for X-axis.

Improve the holding power

Opposite clamp



\*Image is for X-axis.

### Configuration

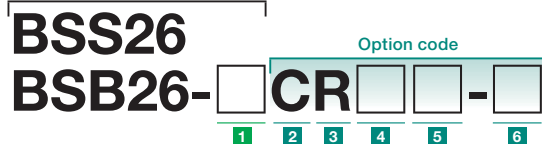
Model	BSS (BSB) 26-	40A	40C	Reference page	50A	50C	Reference page
X,Y	BSS (BSB) 16-	40A	40C	▶ P.2-019~	50A	50C	▶ P.2-021~

\* Combination is model of BSS or BSB.

\* BSB is only for 40.

\* R (opposite-hand) means configuration for X or Y axis of R.

### 1 Model



Select the option code as below.

### 1 Stage table size

40*	40×40mm
50	50×50mm

\*BSB is only for □40

### 6 Grease specification

Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Blank	Feeding position No B/D No feeding type 4.	Feeding position No B/D No feeding type 4.
Blank	J	L

	2 Feeding position		3 Operating position		4 Feeding type (Not available feeding position B/D when selecting)						5 Clamp type			
Specification	Standard micrometer A	Coarse-fine micrometer B	Standard C	Opposite attached micrometer D	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Knob) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic Micrometer	Standard clamp	Disk clamp	Opposite clamp
Code	A/C Center/Side	B/D Center/Side	Blank	R	Blank	1	FP	LP	SH	FH	4	Blank	5	6

⚠ A color of the parts may be silver due to the option model.

### SPEC

Model	BSS26-40A	BSS26-40C	BSS26-50A	BSS26-50C	BSB26-40A	BSB26-40C
(Opposite hand)	BSB26-40AR	BSS26-40CR	BSS26-50AR	BSS26-50CR	BSB26-40AR	BSB26-40CR
Stage table size	40×40mm		50×50mm		40×40mm	
Feeding position	Center	Side	Center	Side	Center	Side
Travel distance	±6.5mm					
Minimum reading of micrometer	10μm					
Guide	Linear ball guide					
Load capacity	9.7kgf [95.1N]		14.7kgf [144.1N]		9.7kgf [95.1N]	
Travel accuracy	Straightness Within 1μm					
	Pitching Within 25"					
	Yawing Within 15"					
Allowable load for moment	Pitch 5.0N · m		6.0N · m		5.0N · m	
	Yaw 5.0N · m		6.8N · m		5.0N · m	
	Roll 5.0N · m		6.0N · m		5.0N · m	
	Pitch 0.63"/N · cm		0.24"/N · cm		0.63"/N · cm	
Moment rigidity	Yaw 0.70"/N · cm		0.28"/N · cm		0.70"/N · cm	
	Roll 0.63"/N · cm		0.24"/N · cm		0.63"/N · cm	
	Parallelism Within 30μm					
Motion parallelism Within 12μm						
Squareness Within 10μm						
Weight	0.46kg		0.56kg		0.46kg	
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating	
Provided screws (Hex socket screws)	4 of M3—6					

X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

Goniometer

Rotary

Unit

Accessories

Linear  
Ball

Cross  
Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

**Dimensional outline drawings**

☉ The center hole tolerance H8 for BSB.



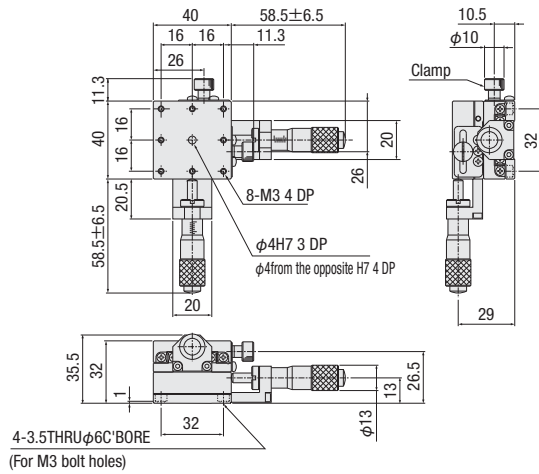
CAD COMMUNITY

CAD DATA

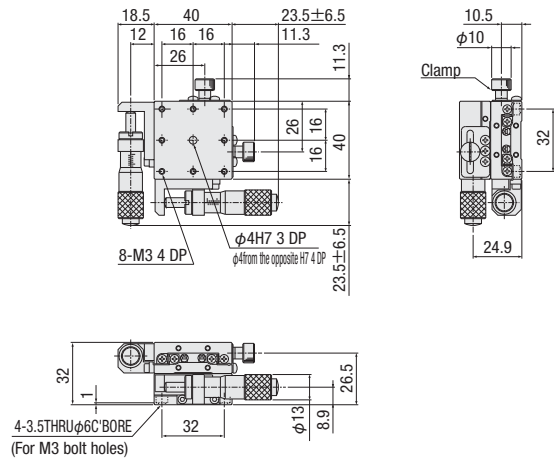


CAD 3D-2D

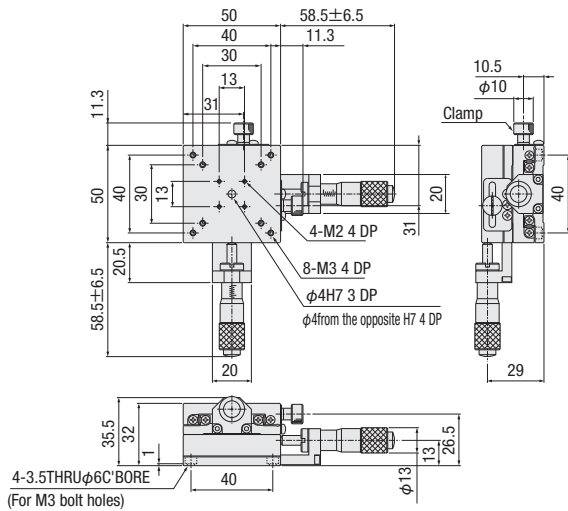
**BSS26-40A/BSB26-40A**



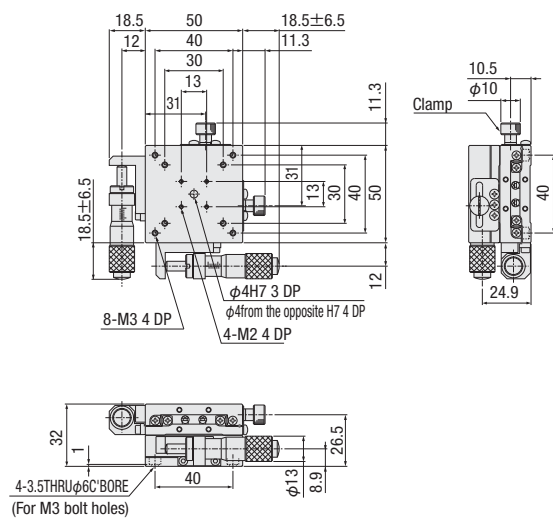
**BSS26-40C/BSB26-40C**



**BSS26-50A**



**BSS26-50C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 100

□ 120

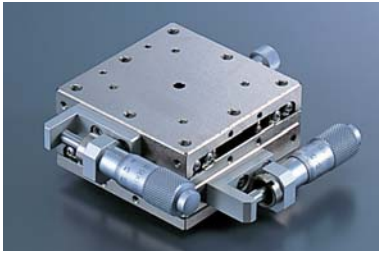
Other

2

048

## XY-axis Linear Ball Guide (SS) Stage □60/□70: BSS26-60/70/BSB26-60

BSS26-60C



BSB26-60C



Low prices

Linear ball guide  
BYT series



P.2-043~

RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. P.2-009

Precise positioning

Coarse-fine micrometer



\*Minimum scale 0.5μm.  
\*Image is for X-axis.

Cost reduction

Feeding screw



Prevention error · Space-saving

Feeding screw hexagonal wrench operation



\*Image is for X-axis.

Reduce the reading time

Degimatic micrometer



\*\*Image is for X-axis □80.

Improve the fixing accuracy

Disk clamp



\*Image is for X-axis.

Improve the holding power

Opposite clamp



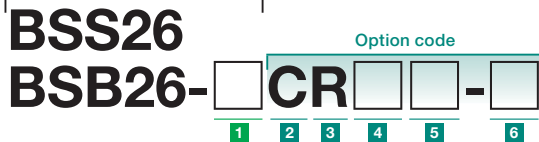
\*Image is for X-axis.

### Configuration

Model	BSS (BSB) 26-70	60A	60C	Reference page	70A	70C	Reference page
X,Y	BSS (BSB) 16-	60A	60C	P.2-023~	70A	70C	P.2-025~

\* Combination is model of BSS or BSB.  
\* BSB is only for 60.  
\* R (opposite-hand) means configuration for X or Y axis of R.

### 1 Model



Select the option code as below.

### 1 Stage table size

60*	60×60mm
70	70×70mm

\*BSB is only □60

### 6 Grease specification

Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Blank	J	L

Specification	2 Feeding position		3 Operating position		4 Feeding type (Not available feeding position B/D when selecting)							5 Clamp type		
	Standard micrometer	Coarse-fine micrometer	Standard	Opposite attached micrometer	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Hex wrench) (P=1.0mm)	Feeding screw (Hex wrench) (P=0.5mm)	Feeding screw (Hex wrench) (P=0.25mm)	Degimatic Micrometer	Standard clamp	Disk clamp	Opposite clamp
Code	A/C Center/Side	B/D Center/Side	Blank	R	Blank	1	FP	LP	SH	FH	4	Blank	5	6

⦿ A color of the parts may be silver due to the option model.

### SPEC

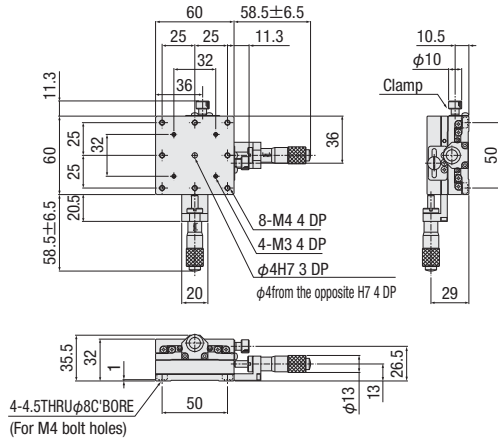
Model	BSS26-60A	BSS26-60C	BSS26-70A	BSS26-70C	BSB26-60A	BSB26-60C
(Opposite hand)	BSS26-60AR	BSS26-60CR	BSS26-70AR	BSS26-70CR	BSB26-60AR	BSB26-60CR
Stage table size	60×60mm			70×70mm		60×60mm
Feeding position	Center		Side	Center		Side
Travel distance	±6.5mm					
Minimum reading of micrometer	10μm					
Guide	Linear ball guide					
Load capacity	19.6kgf [192.1N]		22.4kgf [219.5N]		19.6kgf [192.1N]	
Travel accuracy	Straightness Within 1μm					
	Pitching Within 25"					
	Yawing Within 15"					
Allowable load for moment	Pitch 9.0N·m		12.9N·m		9.0N·m	
	Yaw 10.0N·m		13.8N·m		10.0N·m	
	Roll 9.0N·m		12.9N·m		9.0N·m	
	Pitch 0.13"/N·cm		0.09"/N·cm		0.13"/N·cm	
Moment rigidity	Yaw 0.16"/N·cm		0.10"/N·cm		0.16"/N·cm	
	Roll 0.13"/N·cm		0.09"/N·cm		0.13"/N·cm	
	Parallelism Within 30μm					
Motion parallelism Within 12μm						
Squareness Within 10μm						
Weight	0.8kg		1.16kg		0.8kg	
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating	
Provided screws (Hex socket screws)	4 of M4-6					

**Dimensional outline drawings**

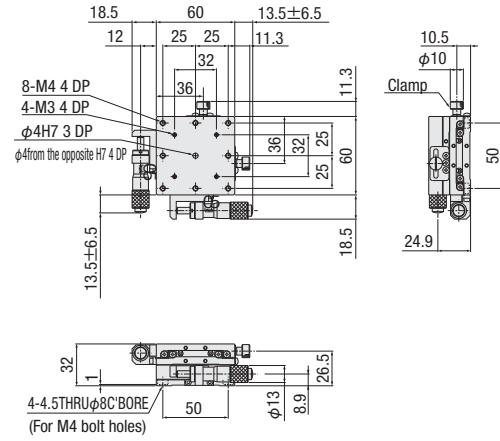
☉ The center hole tolerance H8 for BSB.



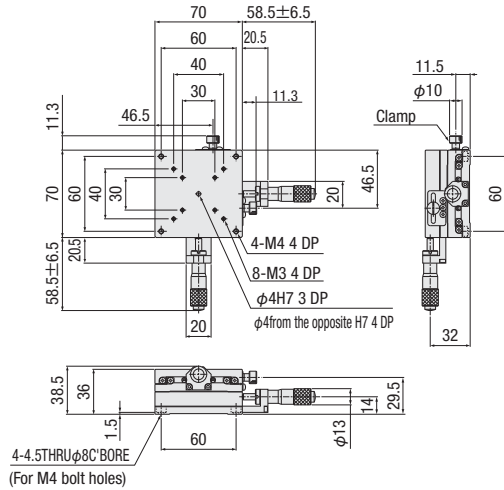
**BSS26-60A/BSB26-60A**



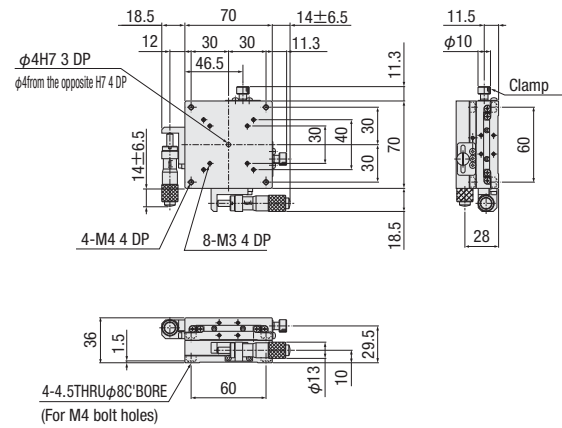
**BSS26-60C/BSB26-60C**



**BSS26-70A**



**BSS26-70C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other

2

050

## XY-axis Linear Ball Guide (SS) Stage □80/□100: BSS26-80/100/BSB26-80

**BSS26-80C**



**BSB26-80C**



RoHS

**Optional sample** \*The photo is for illustrative purpose only.

Please refer to optional introduction pages for details. [CP.2-009~](#)

**Precise positioning**  
Coarse-fine micrometer



\*Minimum scale 0.5μm.  
\*Stroke is ±6.5mm.  
\*Image is for X-axis.

**Cost reduction**  
Feeding screw



**Reduce the reading time**  
Degimatic micrometer



\*Image is for X-axis.

**Improve the fixing accuracy**  
Disk clamp



\*Image is for X-axis.

### Configuration

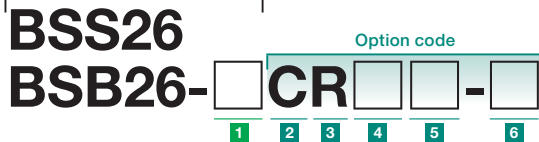
Model	BSS (BSB) 26-	80A	80C	Reference page	100A	100C	Reference page
X,Y	BSS (BSB) 16-	80A	80C	<a href="#">P.2-027~</a>	100A	100C	<a href="#">P.2-029~</a>

\* Combination is model of BSS or BSB.

\* BSB is only for 80.

\* R (opposite-hand) means configuration for X or Y axis of R.

### 1 Model



Select the option code as below.

### 1 Stage table size

80*	80×80mm
100	100×100mm

\*BSB is only □80

### 6 Grease specification

Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Blank	J	L

Specification	2 Feeding position		3 Operating position		4 Feeding type (Not available feeding position B/D when selecting)				5 Clamp type	
	Standard micrometer	Coarse-fine micrometer	Standard	Opposite attached micrometer	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (P=1.0mm)	Degimatic Micrometer	Standard clamp	Disk clamp
Code	A/C Center/Side	B/D Center/Side	Blank	R	Blank	TP	GP	4	Blank	5

⚠ A color of the parts may be silver due to the option model.

### SPEC

Model	BSS26-80A	BSS26-80C	BSS26-100A	BSS26-100C	BSB26-80A	BSB26-80C
<b>(Opposite hand)</b>	<b>BSS26-80AR</b>	<b>BSS26-80CR</b>	<b>BSS26-100AR</b>	<b>BSS26-100CR</b>	<b>BSB26-80AR</b>	<b>BSB26-80CR</b>
Stage table size	80×80mm		100×100mm		80×80mm	
Feeding position	Center	Side	Center	Side	Center	Side
Travel distance	±12.5mm					
Minimum reading of micrometer	10μm					
Guide	Linear ball guide					
Load capacity	26.1kgf [255.8N]		33.6kgf [329.3N]		26.1kgf [255.8N]	
Travel accuracy	Straightness					
	Within 3μm					
	Pitching					
Within 25"						
Allowable load for moment	Yawing					
	Within 15"					
	Pitch		17.7N·m		30.7N·m	
Yaw		18.2N·m		31.8N·m		
Roll		17.7N·m		30.7N·m		
Moment rigidity	Pitch		0.06"/N·cm		0.03"/N·cm	
	Yaw		0.08"/N·cm		0.04"/N·cm	
	Roll		0.06"/N·cm		0.03"/N·cm	
Parallelism	Within 40μm					
Motion parallelism	Within 15μm					
Squareness	Within 10μm					
Weight	1.8kg		2.66kg		1.8kg	
Main material—Surface finishing	Stainless—Electroless nickel plating				Stainless—Low temperature black chrome plating	
Provided screws (Hex socket screws)	4 of M4—6					

**Dimensional outline drawings**

☉ The center hole tolerance H8 for BSB.



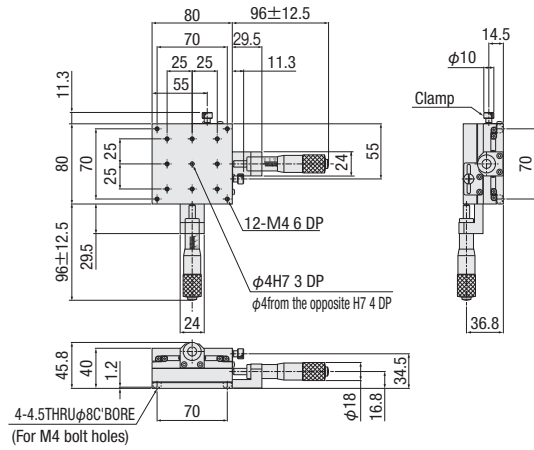
**PART**  
COMMUNITY

CAD DATA

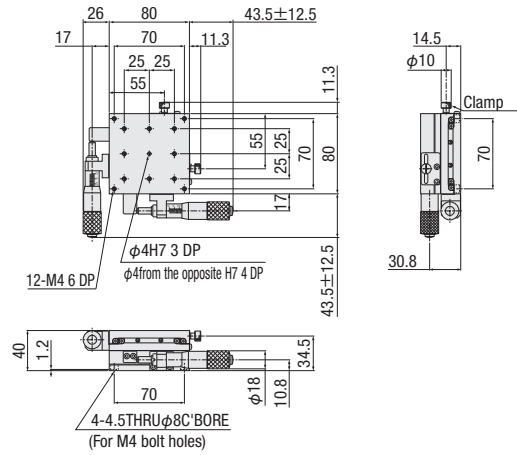


CAD  
3D·2D

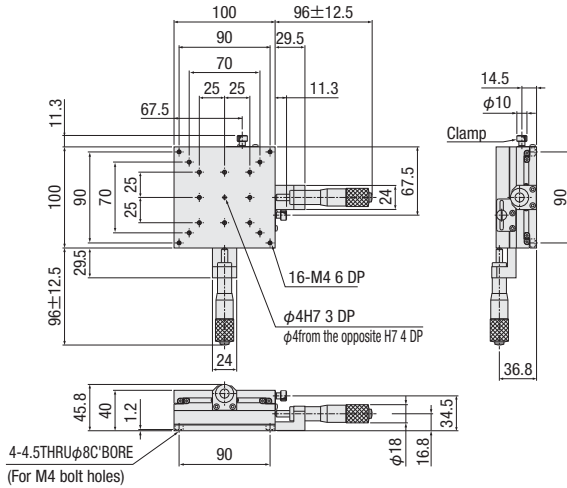
**BSS26-80A/BSB26-80A**



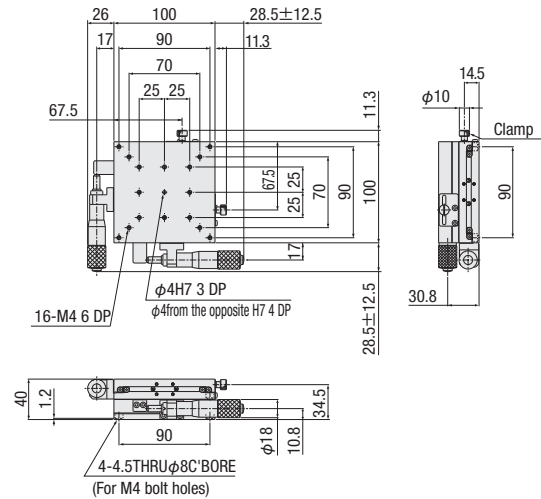
**BSS26-80C/BSB26-80C**



**BSS26-100A**



**BSS26-100C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

052

## Z-axis Linear Ball Guide BZT Series □40□60: BZT04013/BZT06013

RoHS



BZT04013-UL



BZT06013-UL

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

1 Model  
**BZT04013-UL**  
 Option code  
 1 2 3

1 Stage table size

04	40mm
06	60mm

2 Travel distance

013	13mm
-----	------

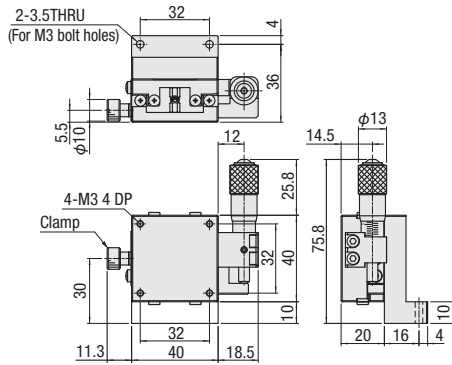
3 Operating position

L	L opposite hand
R	Opposite hand

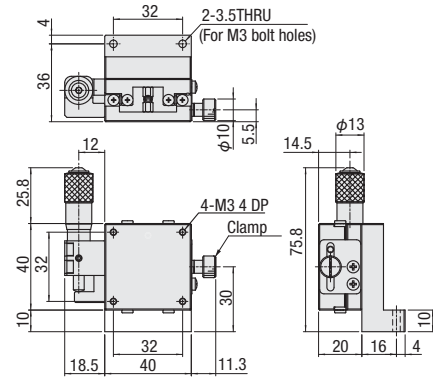
SPEC		
Model	BZT04013	BZT06013
Stage table size	40×40mm	60×60mm
Operation position	Side	Side
Travel distance	±6.5mm	±6.5mm
Travel distance per rotation of feed screw	0.5mm	0.5mm
Minimum reading of micrometer	10μm	10μm
Travel guide	Linear ball guide	Linear ball guide
Load capacity	2.0kgf [19.6N]	2.0kgf [19.6N]
Travel accuracy	Straightness	10μm
	Pitching	30"
	Yawing	25"
Moment rigidity	Pitch	0.38"/N · cm
	Yaw	0.35"/N · cm
	Roll	0.21"/N · cm
Parallelism	—	—
Weight	0.42kg	0.82kg
Main material—Surface finishing	Steel—Electroless nickel plating	Steel—Electroless nickel plating
Provided screws (Hex socket screws)	2 of M3—16	2 of M4—16

**Dimensional outline drawings**

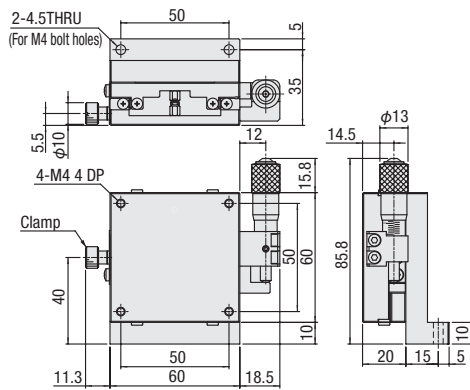
**BZT04013-UL**



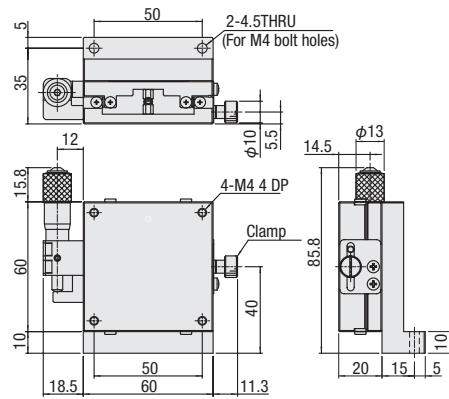
**BZT04013-UR**



**BZT06013-UL**



**BZT06013-UR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

054



## Horizontal Z-axis Stage BHE Series □40□60: BHE04006/BHE06010

RoHS



BHE04006



BHE06010

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

1 Model

# BHE04006

1

2

1 Stage table size

04	40mm
06	60mm

2 Travel distance

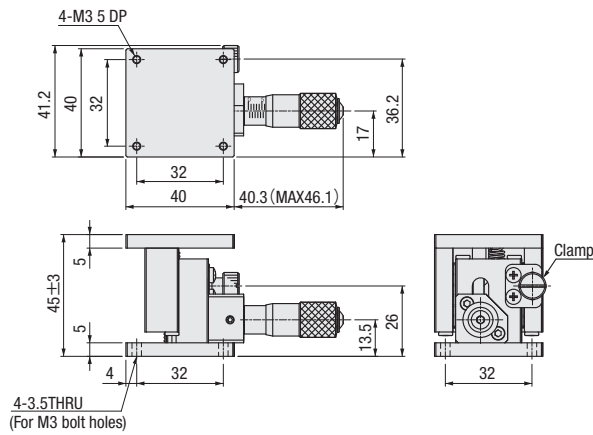
006	6mm
010	10mm

### SPEC

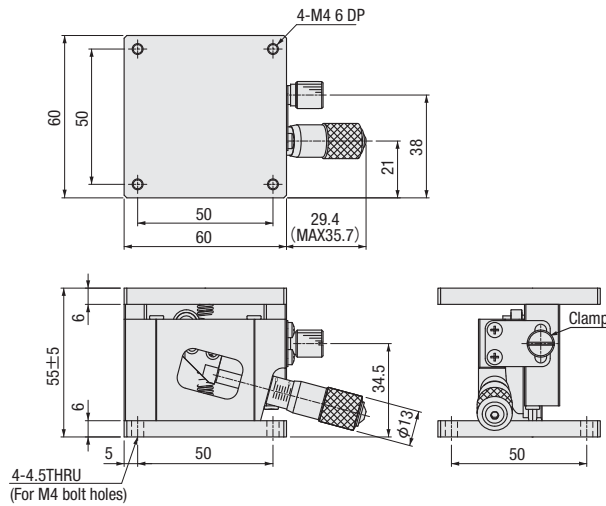
	BHE04006	BHE06010
Model	BHE04006	BHE06010
Stage table size	40×40mm	60×60mm
Travel distance	±3mm	±5mm
Minimum reading of micrometer	≒5μm	≒10μm
Travel guide	Linear ball guide	Linear ball guide
Load capacity	3kgf [29.4N]	5kgf [49N]
Parallelism	80μm	80μm
Weight	0.3kg	0.7kg
Main material—Surface finishing	Steel—Electroless nickel plating	Steel—Electroless nickel plating
Provided screws (Hex socket screws)	4 of M3—10	4 of M4—12

**Dimensional outline drawings**

**BHE04006**



**BHE06010**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

056

# Manual Stage

## Z-axis Linear Ball Guide (SS) Stage □25~□80: BSS36/BSB36 Series

Manual linear stage

BSS36-60A



BSB36-60A



Low prices Linear ball guide BZT series

P.2-053~

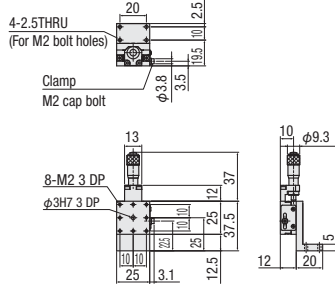
RoHS

### Dimensional outline drawings

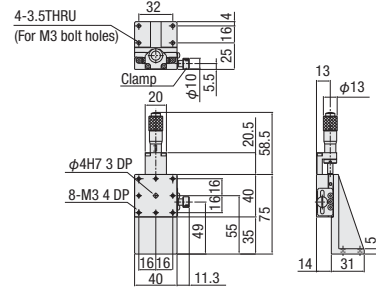
The center hole tolerance H8 for BSB.



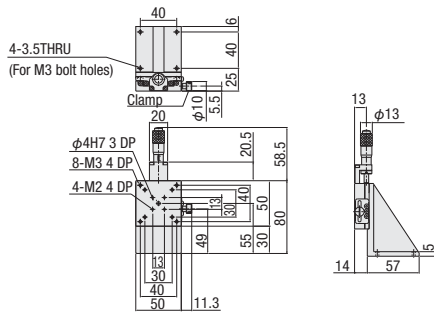
### BSS36-25A/BSB36-25A



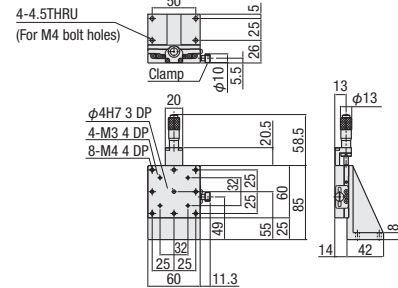
### BSS36-40A/BSB36-40A



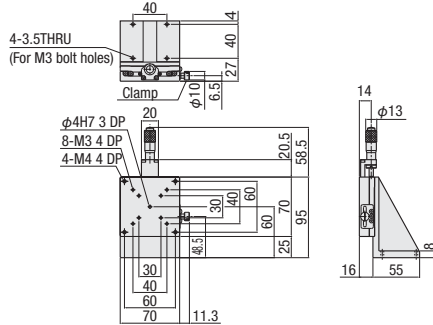
### BSS36-50A



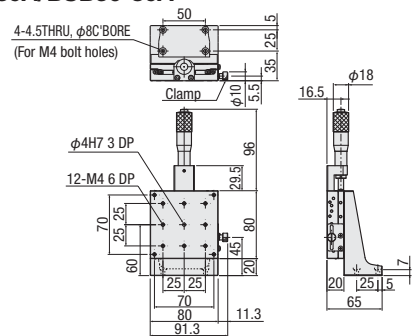
### BSS36-60A/BSB36-60A



### BSS36-70A



### BSS36-80A/BSB36-80A



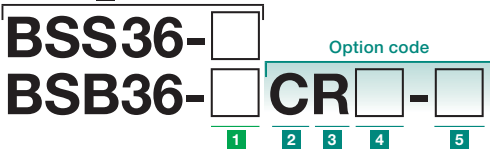
### Configuration

Model	BSS (BSB) 36-25A	25C	25CU※	Reference page	40A	40C	40CU※	Reference page	50A	50C	50CU	Reference page	60A	60C	60CU※	Reference page	70A	70C	70CU	Reference page	80A	80C	80CU※	Reference page
X	BSS (BSB) 16-	25AZ	25C	25CZ※	40AZ	40C	40CZ※	P.2-017~	50AZ	50C	50CZ	P.2-021~	60AZ	60C	60CZ※	P.2-023~	70AZ	70C	70CZ	P.2-025~	80AZ	80C	80CZ※	P.2-027~
Bracket	BSS	ASS25Z-1	—	P.2-180	ASS40Z-1	—	P.2-180	P.2-180	ASS50Z-1	—	P.2-180	P.2-181	ASS60Z-1	—	P.2-181	P.2-181	ASS70Z-1	—	P.2-181	P.2-181	ASS80Z-1	—	P.2-181	P.2-180
	BSB	ASB25Z-1	—	P.2-180	ASB40Z-1	—	P.2-180	P.2-180	—	—	—	P.2-181	ASB60Z-1	—	P.2-181	P.2-181	—	—	—	—	A47-6	—	—	P.2-181

※ The end of CU is available for only BSS.

※ BSB is only for 25 · 40 · 60 · 80.

### 1 Model



Select the option code as below.

A color of the parts may be silver due to the option model.

### 5 Grease specification

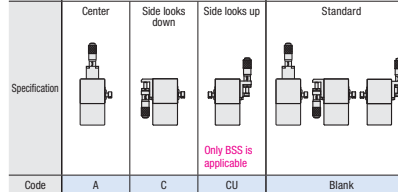
Standard grease	Clean environment grease AFF	Grease for the vacuum FVMBLIN
Blank	J	L

### 1 Stage table size

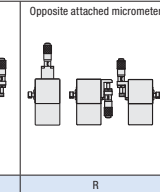
25*	25×25mm
40*	40×40mm
50	50×50mm
60*	60×60mm
70	70×70mm
80*	80×80mm

※ BSB is only for \*.

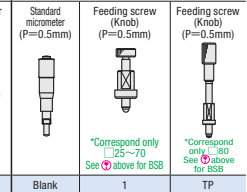
### 2 Feeding position



### 3 Operating position



### 4 Feeding type



### SPEC \* Minimum reading of micrometer 10 μm/Scale · Main material: Stainless · Surface finishing: BSS (Electroless nickel plating) BSB (Low temperature black chrome plating)

Model	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N · m)			Moment rigidity (°/N · cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)	
			Straightness	Pitching	Yawing	Pitch	Yaw	Roll	Pitch	Yaw	Roll					
BSS36-	25*	± 3.2	1.0kgf [9.8N]	3 μm	30"	25"	2.0	2.0	3.5	1.90	1.10	1.10	50 μm	15 μm	0.23	4 of M2 — 8
	40*						5.0	5.0	5.0	0.42	0.35	0.21				4 of M3 — 10
	50						6.8	6.8	6.0	0.15	0.14	0.09				65 μm
BSB36- (only for *)	60*	± 6.5	5.0kgf [49N]	1 μm	* BSB	3 μm	10.0	10.0	9.0	0.08	0.08	0.05	70 μm	30 μm	1.20	4 of M4 — 12
	70						13.8	13.8	12.9	0.06	0.05	0.03				4 of M3 — 12
	80*						± 12.5	3 μm	18.2	18.2	17.7	0.04				0.04

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

2

057

# XZ-axis Linear Ball Guide (SS) Stage □25~□80: BSS66/BSB66 Series

BSS66-60A



BSB66-60A



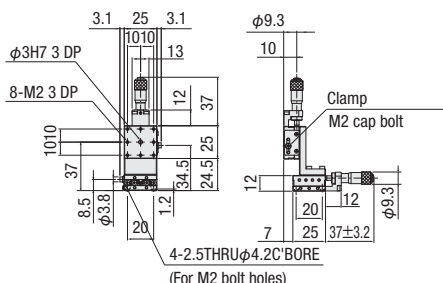
### Dimensional outline drawings

① The center hole tolerance H8 for BSB.  
 \*Refer CAD data about □50-70

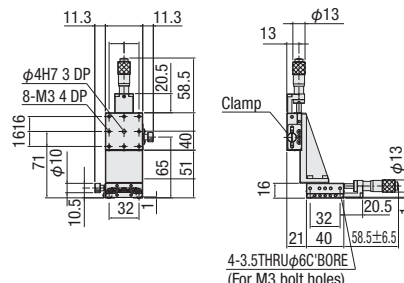


RoHS

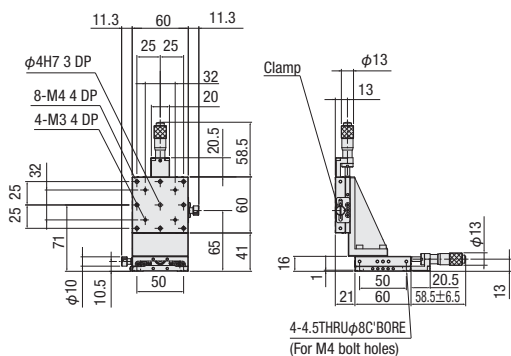
BSS66-25A/BSB66-25A



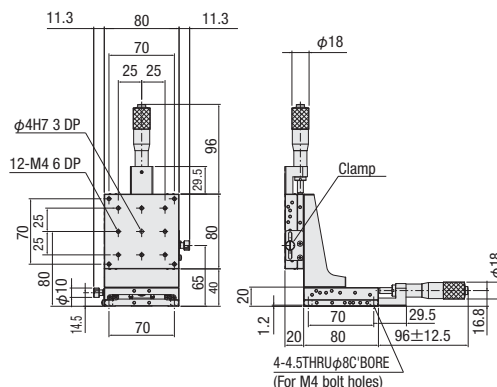
BSS66-40A/BSB66-40A



BSS66-60A/BSB66-60A



BSS66-80A/BSB66-80A

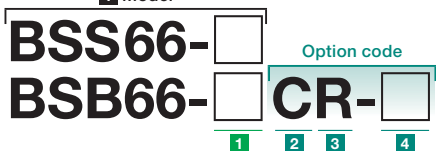


### Configuration

Model	BSS (BSB) 66-	25A	25C	40A	40C	50A	50C	60A	60C	70A	70C	80A	80C	Reference page [Z]
Z	BSS (BSB) 36-	25A	25C	40A	40C	50A	50C	60A	60C	70A	70C	80A	80C	②P.2-057
X	BSS (BSB) 16-	25A	25C	40A	40C	50A	50C	60A	60C	70A	70C	80A	80C	-
	Reference page	③P.2-017~		③P.2-019~		③P.2-021~		③P.2-023~		③P.2-025~		③P.2-027~		

※BSB is only for 25·40·60·80.  
 ※Combine with each BSS/BSB.  
 ※R means both of X, Z-axis is configured R.

### 1 Model



Select the option code as below.

① A color of the parts may be silver due to the option model.

### 4 Grease specification

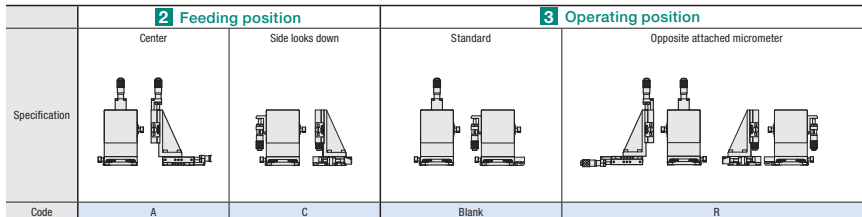
Standard grease	Clean environment grease AFF	Grease for the vacuum FUMBLIN
Blank	J	L

### 1 Stage table size

25*	25×25mm
40*	40×40mm
50	50×50mm
60*	60×60mm
70	70×70mm
80*	80×80mm

※BSB is only for \*

### 2 Feeding position



### 3 Operating position

SPEC \* Minimum reading of micrometer 10 μm/Scale \* Main material: Stainless \* Surface finishing: BSS (Electroless nickel plating) BSB (Low temperature black chrome plating)

Model	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)
			Straightness	Pitching	Yawing	Pitch	Yaw	Roll	Pitch	Yaw	Roll				
BSS66-	25*	± 3.2	1.0kgf [9.8N]	3 μm	30"	25"	2.0	2.0	3.5	3.80	2.20	2.20	25 μm	0.30	4 of M2 - 4
							5.0	5.0	5.0	0.84	0.56	0.56			
BSB66- (only for *)	40*	± 6.5	5.0kgf [49N]	1 μm	25"	15"	6.8	6.0	6.0	0.30	0.23	0.23	80 μm	32 μm	4 of M3 - 6
							10.0	9.0	9.0	0.16	0.13	0.13			
BSB66- (only for *)	60*	± 12.5	5.0kgf [49N]	3 μm	30"	25"	13.8	12.9	12.9	0.12	0.08	0.08	90 μm	38 μm	4 of M4 - 6
							18.2	17.7	17.7	0.08	0.06	0.06			

Manual linear stage

X  
XY  
Z  
Horizontal Z  
XZ

Horizontal XZ  
XYZ

Horizontal XYZ  
Goniometer  
Rotary  
Unit  
Accessories

Linear Ball

Cross Roller

Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

# Manual Stage

## Thin Type XYZ-axis Linear Ball Guide (SS) Stage □40~□80: BSS73 Series

Manual linear stage

BSS73-60A



BSS73-60C



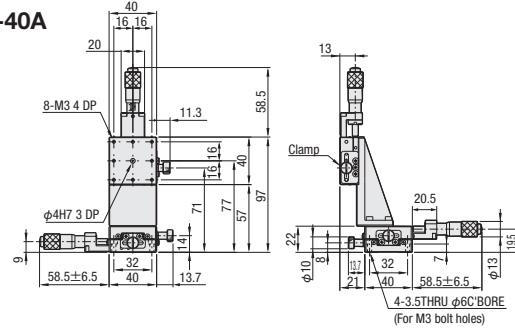
### Dimensional outline drawings



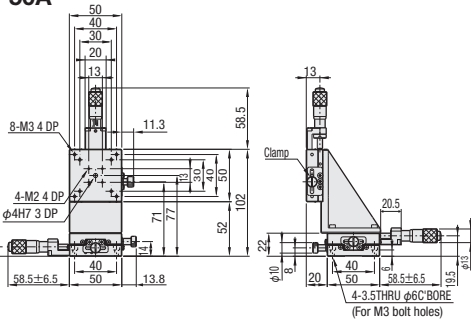
RoHS

CAD 3D·2D

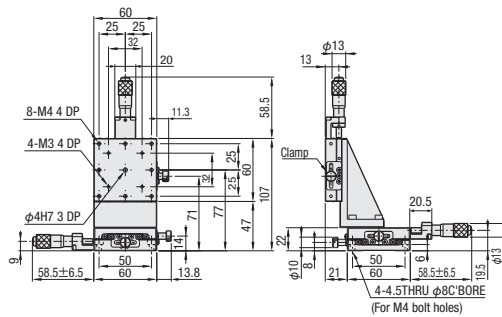
BSS73-40A



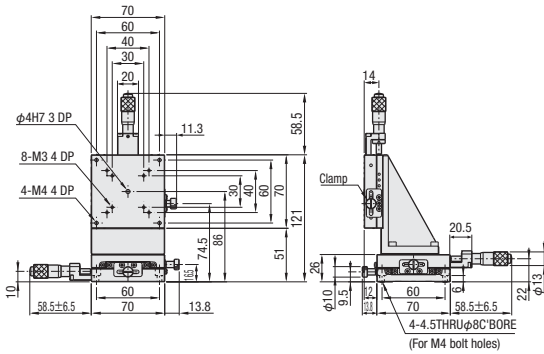
BSS73-50A



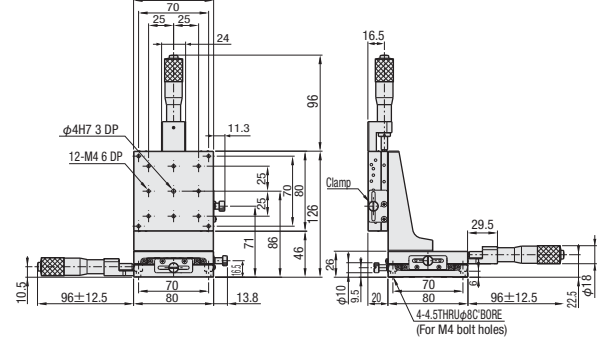
BSS73-60A



BSS73-70A



BSS73-80A

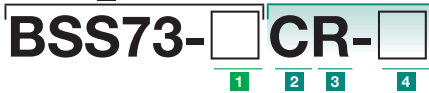


### Configuration

Model	BSS73-	40A	40C	40CU	Reference page	50A	50C	50CU	Reference page	60A	60C	60CU	Reference page	70A	70C	70CU	Reference page	80A	80C	80CU	Reference page
Z	BSS36-	40A	40C	40CU	● P.2-057	50A	50C	50CU	● P.2-057	60A	60C	60CU	● P.2-057	70A	70C	70CU	● P.2-057	80A	80C	80CU	● P.2-057
XY	BSS23-	40A	40C		● P.2-039~	50A	50C		● P.2-039~	60A	60C		● P.2-039~	70A	70C		● P.2-039~	80A	80C		● P.2-941~

※R (opposite-hand) means configuration for XYor Z-axis of R

### 1 Model



### Option code

Select the option code as below.

### 4 Grease specification

Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Blank	J	L

### 1 Stage table size

40	40×40mm
50	50×50mm
60	60×60mm
70	70×70mm
80	80×80mm

### 2 Feeding position

Specification	Center	Side looks down	Side looks up
Code	A	C	CU

### 3 Operating position

Specification	Standard	Opposite attached micrometer
Code	Blank	R

### SPEC \* Minimum reading of micrometer 10 μm/Scale · Main material: Stainless · Surface finishing: BSS (Electroless nickel plating)

Model	Feeding position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment(N·m)			Moment rigidity (C/N·cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (flex socket screws)
				Straightness	Pitching	Yawing	Pitch	Yaw	Roll	Pitch	Yaw	Roll				
BSS73-	40	± 6.5	5.0kgf [49N]	3 μm	40°	20°	5.0	1.15	0.89	1.27	95 μm	35 μm	0.66	4 of M3 - 10		
	50						4.5	5.4	4.5	0.91					0.43	0.86
	60						9.0	8.1	9.0	0.29					0.24	0.28
	70						12.4	11.5	12.4	0.17					0.12	0.18
80	± 12.5			16.4	15.9	16.4	0.13	0.08	0.12	110 μm	45 μm	2.52	4 of M4 - 10			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

059

# XYZ-axis Linear Ball Guide (SS) Stage □25~□80: BSS76/BSB76 Series

## BSS76-60A



### Dimensional outline drawings

☞ The center hole tolerance H8 for BSB.



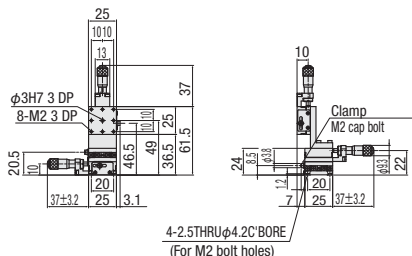
RoHS

CAD 3D·2D

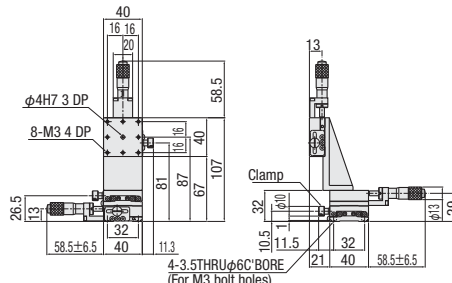
## BSB76-60A



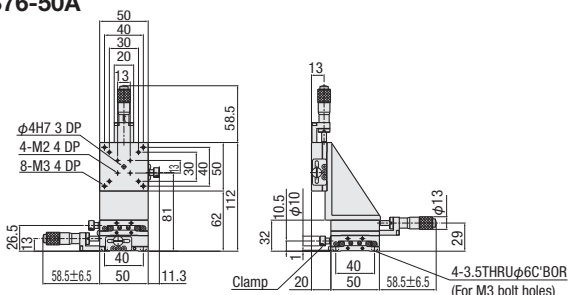
## BSS76-25A/BSB76-25A



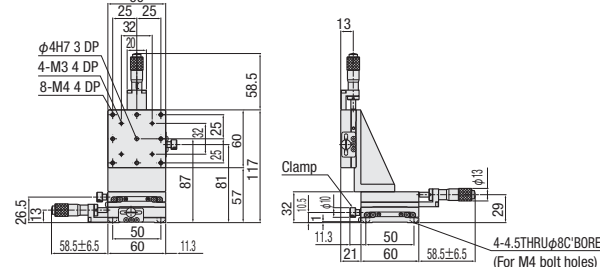
## BSS76-40A/BSB76-40A



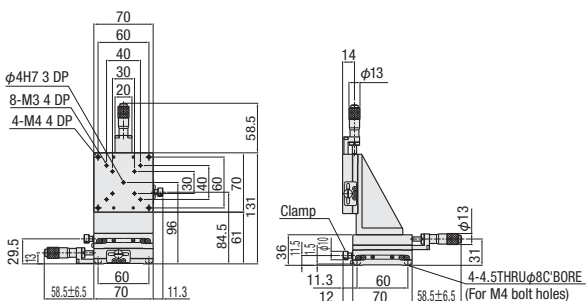
## BSS76-50A



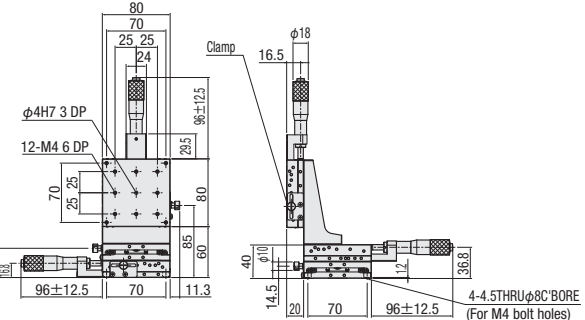
## BSS76-60A/BSB76-60A



## BSS76-70A



## BSS76-80A/BSB76-80A

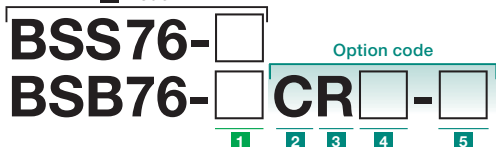


### Configuration

Model	BSS (BSB) 76-	25A	25C	25CU	Reference page	40A	40C	40CU	Reference page	50A	50C	50CU	Reference page	60A	60C	60CU	Reference page	70A	70C	70CU	Reference page	80A	80C	80CU	Reference page
Z	BSS (BSB) 36-	25A	25C	25CU	P.2-057	40A	40C	40CU	P.2-057	50A	50C	50CU	P.2-057	60A	60C	60CU	P.2-057	70A	70C	70CU	P.2-057	80A	80C	80CU	P.2-057
X,Y	BSS (BSB) 16-	25A	25C		P.2-045~	40A	40C		P.2-047~	50A	50C		P.2-047~	60A	60C		P.2-048~	70A	70C		P.2-048~	80A	80C		P.2-051~

※ R (opposite-hand) means configuration for X or Y or Z-axis of R. ※ BSB is only for 25 · 40 · 60 · 80.

### 1 Model



Select the option code as below.

☞ A color of the parts may be silver due to the option model.

### 5 Grease specification

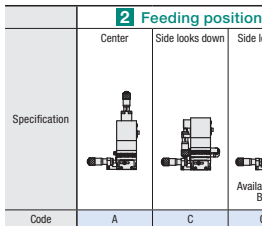
Standard grease	Clean environment grease AFF	Grease for the vacuum FOMBLIN
Blank	J	L

### 1 Stage table size

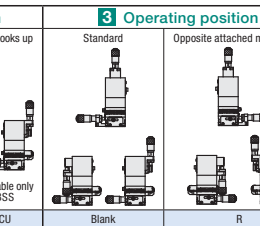
25*	25×25mm
40*	40×40mm
50	50×50mm
60*	60×60mm
70	70×70mm
80*	80×80mm

※ BSB is only for \*.

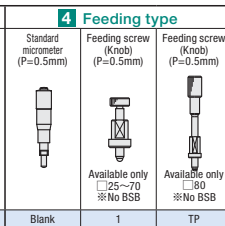
### 2 Feeding position



### 3 Operating position



### 4 Feeding type



### SPEC \* Minimum reading of micrometer 10 μm/Scale · Main material: Stainless · Surface finishing: BSS (Electroless nickel plating) BSB (Low temperature black chrome plating)

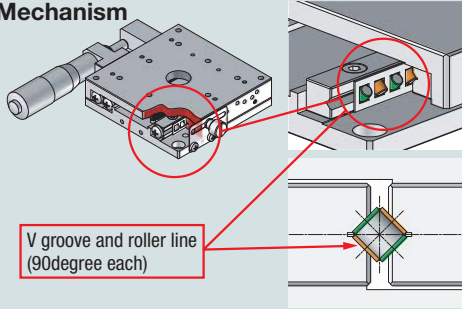
Model	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)	
			Straightness	Pitching	Yawing	Pitch	Yaw	Roll	Pitch	Yaw	Roll					
BSS76-	25 *	± 3.2	1.0kgf [9.8N]	3 μm	30"	25"	2.0	2.0	3.5	4.10	3.30	4.90	80 μm	25 μm	0.37	4 of M2 - 4
	40 *						5.0	5.0	5.0	0.98	0.91	1.05				4 of M3 - 6
BSB76- (only for *)	50	± 6.5	5.0kgf [49N]	1 μm	25"	15"	6.0	6.0	6.0	0.38	0.37	0.39	95 μm	35 μm	1.00	4 of M3 - 6
	60 *						9.0	9.0	9.0	0.21	0.21	0.21				2.00
	70						12.9	12.9	12.9	0.14	0.13	0.15				3.00
80 *	± 12.5			3 μm			17.7	17.7	17.7	0.10	0.10	0.10	110 μm	45 μm	3.00	4 of M4 - 6

- Manual linear stage
- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other
- 2
- 060

## Cross Roller Guide Stage Guidance/Lineup

- [Features]**
- Light weight and high precision stages
  - Various line up

**Mechanism**



V groove and roller line (90degree each)

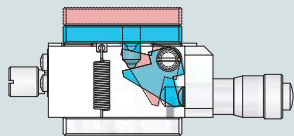
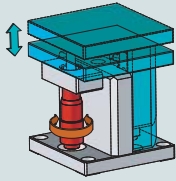
**Linear-motion series**

- Light weight** **B11 series:** Light weight and high precision with aluminum material.
- Long stroke** **B12 series:** Available long stroke more than square type.
- High resolution** **B10 series:** Available coarse-fine operation (0.5μm/scale) with two of micrometers.

---

**Horizontal Z series**

- Table surface goes up and down horizontally.
- We offer a wide range of variation such as size, materials, thin type, high rigidity.
- Lever type: B33 series  
A structure to transmit feeding of the micrometer using leverage.
- Push up the micrometer directly: B37-60
- Moving a table up/down directly with micrometer.  
Long stroke motion and high load capacity are possible in comparison with the leverage.

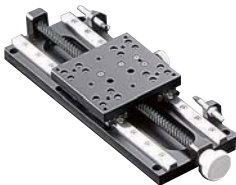



**Low price** Linear ball guide type BHE series also lined-up **P.2-055~**

Series	Stage table size (mm)	Travel distance per rotation (mm)	Load capacity (kgf) [N]	Material
B11 series (Light and high precision)	□25	0.25~0.5	~1 [9.8]	Aluminum
	□40	0.25~1.0	~2 [19.6]	
	□60		~5 [49.0]	
	□80	0.5~1.0	~10 [98.0]	
	□100		~15 [147]	
	□120		~20 [196]	
B27-100 series	□100	0.5	~6.5 [63.7]	Aluminum
B12 series (Long stroke)	25×60	~3	~2 [19.6]	Aluminum
	60×110		~8 [78.4]	
B10 series (High resolution)	□60	~0.5	~5 [49.0]	Aluminum
	□80		~6 [58.8]	
B33 series (Aluminum horizontal Z)	□25	Approx.0.5	~1 [9.8]	Aluminum
	□40		~2 [19.6]	
	□60		~4 [39.2]	
	□70		~4 [39.2]	
	□80		~3 [29.4]	

\*Amount shows for single axis

### Misc.(stage other than cross roll)

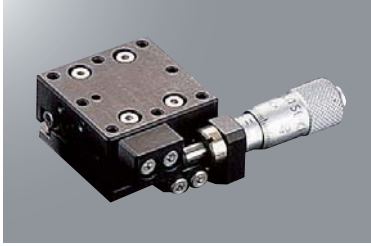
X-axis	Z-axis	
Slide guide stage	Z-axis mount	Laboratory jack
Load capacity 15kgf Stroke ~274mm	Load capacity 15kgf Stroke 234mm	Load capacity ~10kgf Stroke ~70mm
B15 series	B34 series	B35 series
		
<b>P.2-091~</b>	<b>P.2-093</b>	<b>P.2-094</b>

Series	Stage table size (mm)	Stroke (X-axis/mm)						Axis configuration • Listing page												
		~5	~10	~15	~20	~30	~40	~50	X	XY	Thin type XY	Z	Horizontal Z	XZ	Horizontal XZ	XYZ	Horizontal thin type XYZ	Horizontal XYZ		
B11	□25	■	■						●	●		●		●		●				
									▶P.2-063~	▶P.2-069~		▶P.2-079		▶P.2-080		▶P.2-081				
	□40	■	■	■					●	●	●	●		●		●				
									▶P.2-063~	▶P.2-069~	▶P.2-073~	▶P.2-079		▶P.2-080		▶P.2-081				
	□60	■	■	■	■				●	●	●	●		●		●				
									▶P.2-063~	▶P.2-069~	▶P.2-073~	▶P.2-079		▶P.2-080		▶P.2-081				
B11	□80	■	■	■	■	■			●	●	●	●		●		●				
									▶P.2-065~	▶P.2-071~	▶P.2-075~	▶P.2-079		▶P.2-080		▶P.2-081				
	□100	■	■	■	■	■			●	●	●									
								▶P.2-065~	▶P.2-071~	▶P.2-075~										
B11	□120	■	■	■	■	■	■		●	●										
									▶P.2-065~	▶P.2-071~										
B27	□100	■	■	■	■	■	■			●										
										▶P.2-077~										
B12	25×60	■	■	■					●											
									▶P.2-067~											
B12	60×110	■	■	■	■	■	■		●											
									▶P.2-067~											
B10	□60	■	■	■					●	●		●				●				
									▶P.2-087~	▶P.2-088~		▶P.2-089				▶P.2-090				
B10	□80	■	■	■	■				●	●		●				●				
									▶P.2-087~	▶P.2-088~		▶P.2-089				▶P.2-090				
B33	□25	■											●		●			●		
													▶P.2-082		▶P.2-084			▶P.2-086		
	□40	■	■										●		●		●	●		
													▶P.2-082		▶P.2-084		▶P.2-085	▶P.2-086		
	□60	■	■	■									●		●		●	●		
												▶P.2-082		▶P.2-084		▶P.2-085	▶P.2-086			
B33	□70	■											●							
													▶P.2-083							
	□80	■											●		●		●	●		
												▶P.2-083		▶P.2-084		▶P.2-085	▶P.2-086			

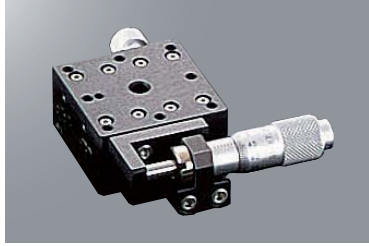


## X-axis Cross Roller Guide Stage □25/□40/□60: B11-25/40/60

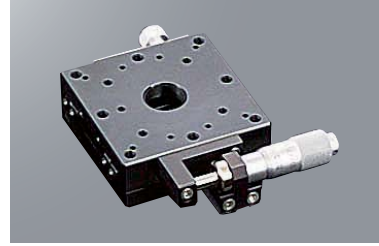
B11-25CN



B11-40C



B11-60C



RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [▶P.2-009~](#)

**Precise positioning**  
Coarse-fine micrometer



※Not available □25.

**Space-saving · Prevention error**  
Feeding screw hexagonal wrench operation



※Image is for □25.

**[Features]**

- Table size □25 · 40 · 60mm cross roller guide stage.
- Main body is light weight by aluminum-made.
- Available each option.

**1 Model**      **Option code**

**B11-25CRN** □

**B11-□CR** □

1    2    3    4

Select the option code as below.

**1 Stage table size**

25	25×25mm
40	40×40mm
60	60×60mm

**2 Feeding position**

	Standard micrometer	Coarse-fine micrometer
A		
B		
C		
D		
Code	A/C Center/Side	B/D Center/Side

Minimum reading capability 0.5μm

**3 Operating position**

	Standard	Opposite attached micrometer	Vertically attached micrometer
Code	Blank	R	Z

Not available when select B or D  
Not available combination use R

**4 Feeding type (Not available feeding position B/D when selecting)**

	Standard micrometer (P=0.5mm)	Feeding screw (Knob) (P=0.5mm)	Feeding screw (Knob) (P=0.25mm)	Feeding screw (Hex wrench) (P=0.25mm)
Code	Blank	1	FP	FH

Not Z

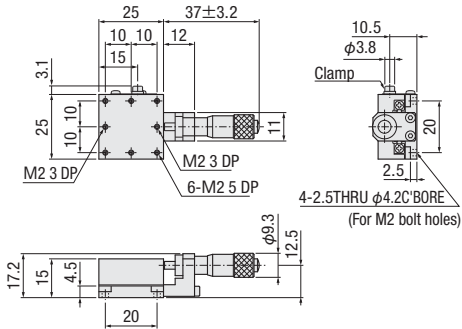
※Not available □25 for B or D

SPEC						
Model	B11-25AN	B11-25CN	B11-40A	B11-40C	B11-60A	B11-60C
(Opposite hand)	B11-25ARN	B11-25CRN	B11-40AR	B11-40CR	B11-60AR	B11-60CR
Feeding Type	Standard micrometer					
Feeding position	Center	Side	Center	Side	Center	Side
Minimum reading of micrometer	10μm/Scale					
Stage table size	25×25mm		40×40mm		60×60mm	
Travel distance	±3.2mm		±6.5mm			
Guide	Cross roller guide					
Load capacity	1.0kgf [9.8N]		2.0kgf [19.6N]		5.0kgf [49.0N]	
Travel accuracy	Straightness					
	Within 30"					
	Pitching					
Allowable load for moment	Within 30"					
	Pitch					
	1.1N · m		2.7N · m		5.2N · m	
	0.8N · m		2.2N · m		4.3N · m	
Moment rigidity	0.4N · m		2.0N · m		5.5N · m	
	Pitch		0.38"/N · cm		0.12"/N · cm	
	Yaw		0.42"/N · cm		0.11"/N · cm	
Parallelism	1.80"/N · cm		0.28"/N · cm		0.07"/N · cm	
	Motion parallelism					
Weight	0.04kg		0.14kg		0.25kg	
Main material—Surface finishing	Aluminum—Black alumite processing					
Provided screws (Hex socket screws)	4 of M2—6		4 of M3—6		4 of M4—6	

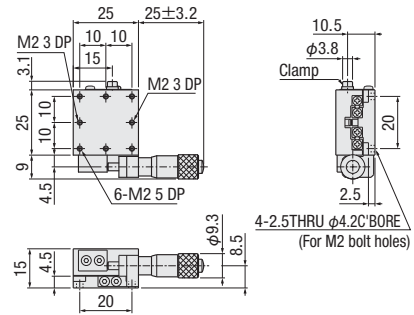
- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

Dimensional outline drawings

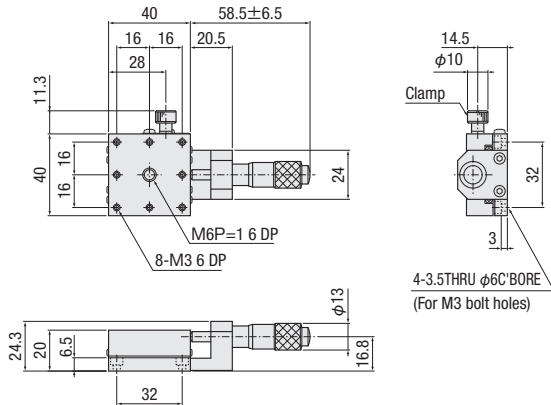
**B11-25AN**



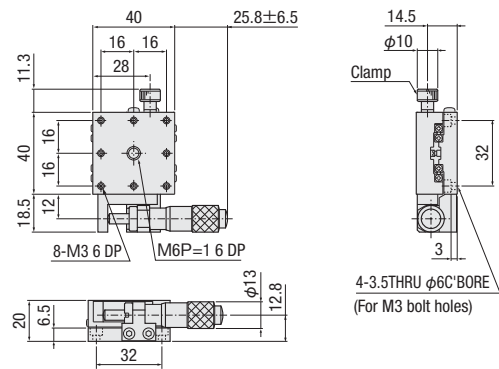
**B11-25CN**



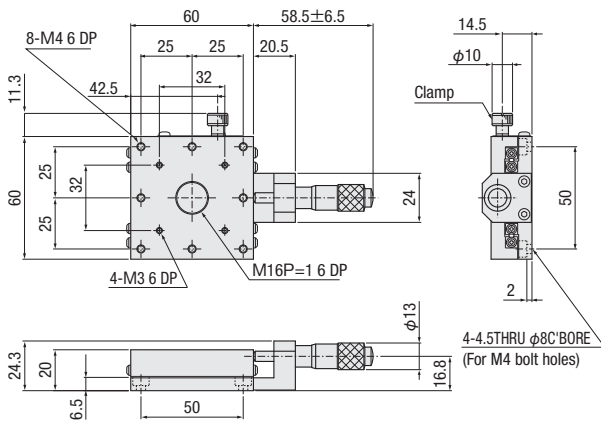
**B11-40A**



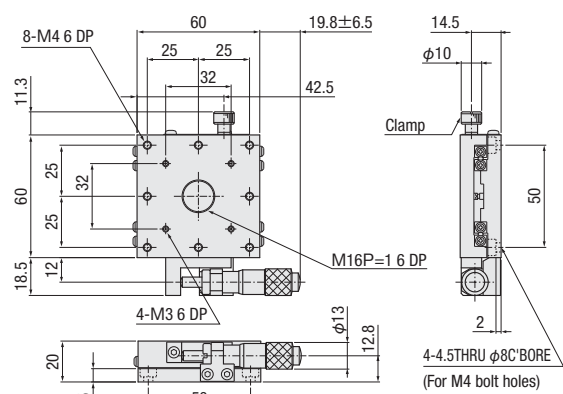
**B11-40C**



**B11-60A**



**B11-60C**



X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

Goniometer

Rotary

Unit

Accessories

Linear  
Ball

Cross  
Roller

Dovetail

□ 25

□ 30

□ 40

□ 60

□ 70

□ 80

□ 100

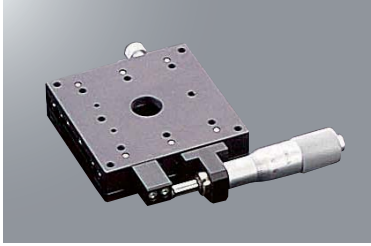
□ 120

Other

# Manual Stage

## X-axis Cross Roller Guide Stage □80/□100/□120: B11-80/100/120

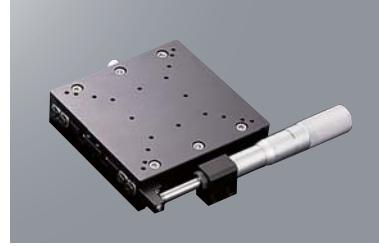
B11-80C



B11-100C



B11-120C



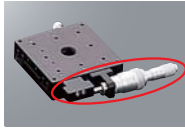
RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [CP.2-009](#)~

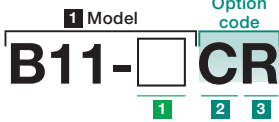
**[Features]**

- Table size □80・100・120mm cross roller guide stage.
- Main body is light weight by aluminum-made.
- Available each option.

Precise positioning  
Coarse-fine micrometer



※ Stroke is ±6.5mm.  
※ Not available □120.



**1 Stage table size**

80	80×80mm
100	100×100mm
120	120×120mm

**2 Feeding position**

Specification	Standard micrometer		Coarse-fine micrometer	
	A	C	B	D
Code	A/C Center/Side		B/D Center/Side	

Travel distance ±6.5mm  
Minimum reading capability 0.5μm  
※ Not available □120

**3 Operating position**

Specification	Standard		Opposite attached micrometer		Vertically attached micrometer	
Code	Blank		R		Z	

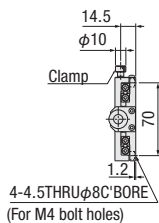
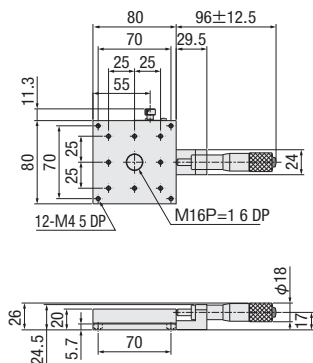
Not available when select B or D  
Not available combination use R  
Not available □100□120

SPEC						
Model	B11-80A	B11-80C	B11-100A	B11-100C	B11-120A	B11-120C
(Opposite hand)	B11-80AR	B11-80CR	B11-100AR	B11-100CR	B11-120AR	B11-120CR
Feeding Type	Standard micrometer					
Feeding position	Center	Side	Center	Side	Center	Side
Minimum reading of micrometer	10μm/Scale					
Stage table size	80×80mm		100×100mm		120×120mm	
Travel distance	±12.5mm					
Guide	Cross roller guide					
Load capacity	10.0kgf [98.0N]		15.0kgf [147.0N]		20.0kgf [196.0N]	
Travel accuracy	Straightness					
	Within 3μm					
	Pitching					
Allowable load for moment	Within 25"					
	Yawing					
	Within 15"					
	Pitch					
Moment rigidity	19.2N・m		36.0N・m		57.2N・m	
	15.1N・m		30.0N・m		44.7N・m	
	17.3N・m		33.0N・m		66.7N・m	
Parallelism	0.05"/N・cm		0.06"/N・cm		0.03"/N・cm	
	0.05"/N・cm		0.07"/N・cm		0.02"/N・cm	
	0.04"/N・cm		0.05"/N・cm		0.01"/N・cm	
Motion parallelism	Within 30μm					
Weight	0.5kg		0.7kg		1.6kg	
Main material—Surface finishing	Aluminum—Black alumite processing					
Provided screws (Hex socket screws)	4 of M4—6				4 of M4—10	

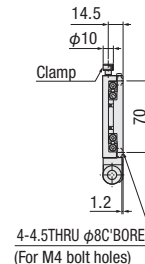
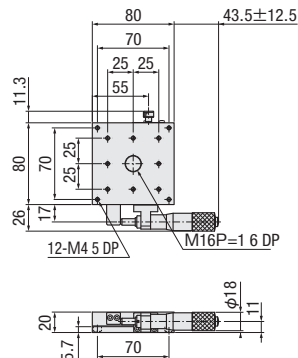
- Manual linear stage
- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

**Dimensional outline drawings**

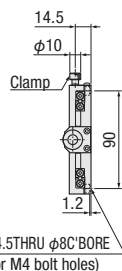
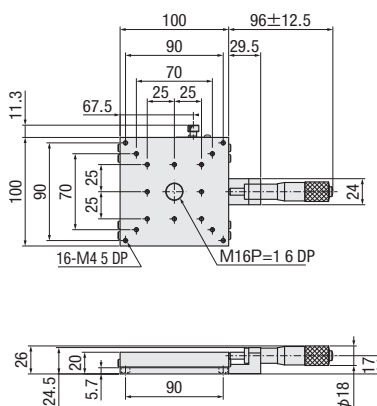
**B11-80A**



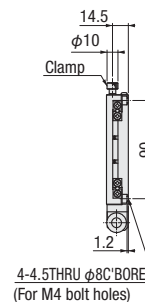
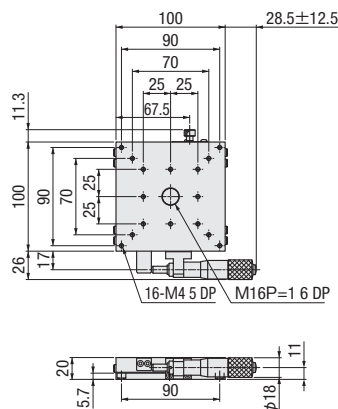
**B11-80C**



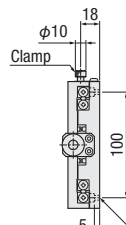
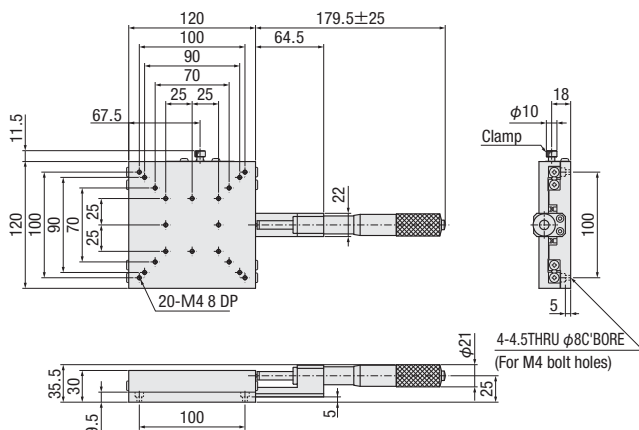
**B11-100A**



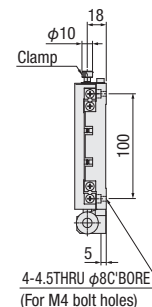
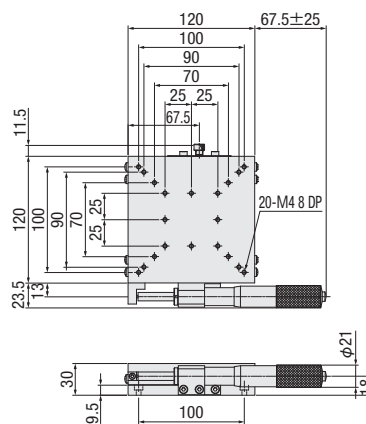
**B11-100C**



**B11-120A**



**B11-120C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

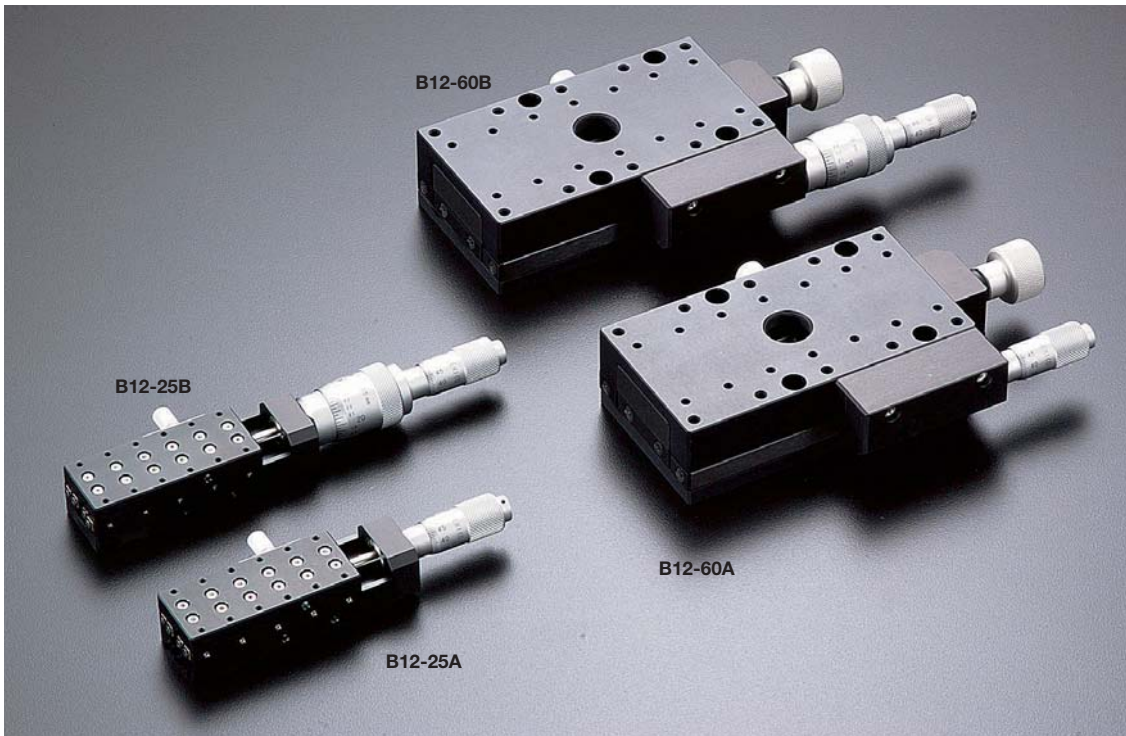
Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

## X-axis Long Stroke Cross Roller Guide Stage: B12-25 (25×60) /60 (60×110)

Manual linear stage

RoHS



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

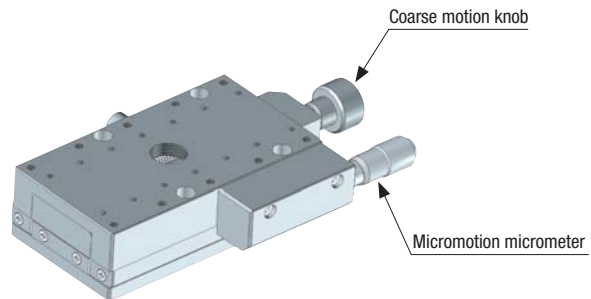
Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120

Other

### [Features]

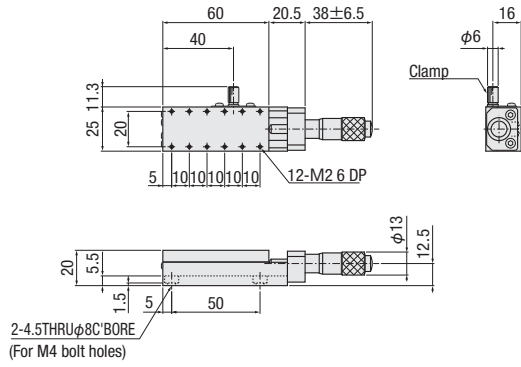
- High accuracy long stroke stage of cross roller guide.
  - Longer stroke than stages with the table size □25mm or 60mm.
  - Selectable coarse-fine micrometer.
- 
- B12-60 series  
Movable 40mm stroke using coarse motion knob. (3mm per rotation)  
Adjustable range of 6.5mm by using a micromotion micrometer.



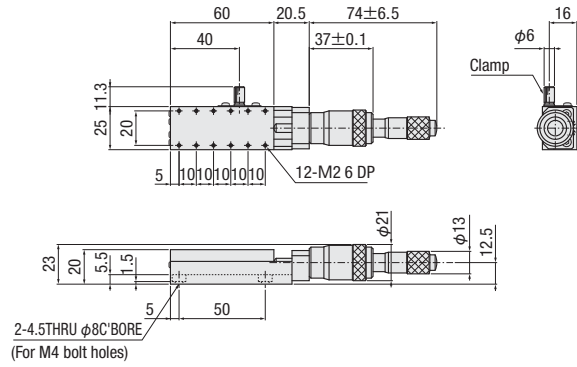
SPEC				
Model	B12-25A	B12-25B	B12-60A	B12-60B
(Opposite hand)	B12-25AR	B12-25BR	—	—
Stage table size	25×60mm		60×110mm	
Travel distance	±6.5mm	Coarse motion ±6.5mm Micromotion ±0.1mm	Coarse motion ±20mm	Micromotion ±6.5mm
Minimum reading of micrometer	10μm/Scale	Coarse-micromotion 0.5μm/Scale	10μm/Scale	Coarse-micromotion 0.5μm/Scale
Guide	Cross roller guide			
Load capacity	2.0kgf [19.6N]		8.0kgf [78.4N]	
Travel accuracy	Straightness		3μm	
	Pitching		25"	
	Yawing		15"	
Allowable load for moment	Pitch		8.1N · m	
	Yaw		7.0N · m	
	Roll		5.3N · m	
	Pitch		0.02"/N · cm	
Moment rigidity	Yaw		0.03"/N · cm	
	Roll		0.07"/N · cm	
	Pitch		1.38"/N · cm	
Parallelism	30μm			
Motion parallelism	10μm			
Weight	0.1kg	0.2kg	0.8kg	
Main material—Surface finishing	Aluminum—Black alumite processing			
Provided screws (Hex socket screws)	2 of M4—6		Hex recessed round head screw 10 of M4—6	

**Dimensional outline drawings**

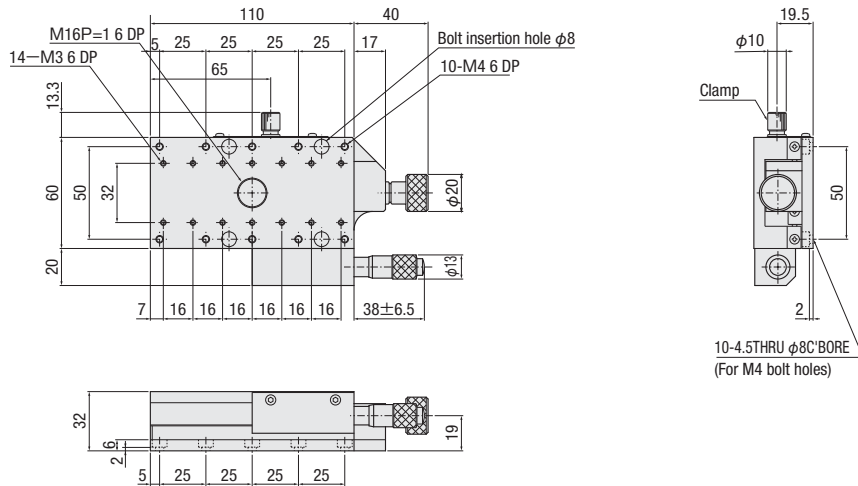
**B12-25A**



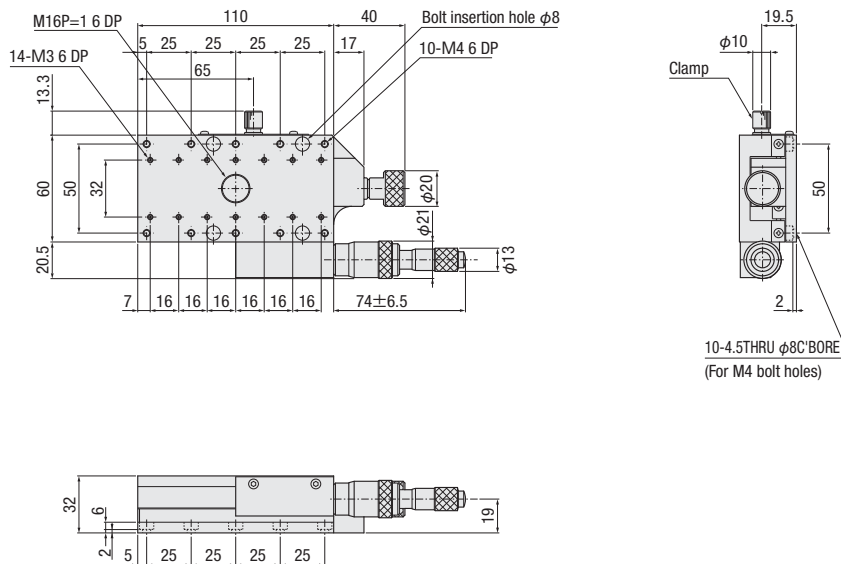
**B12-25B**



**B12-60A**



**B12-60B**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

## XY-axis Cross Roller Guide Stage □25/□40/□60: B21-25/40/60

B21-25AN



B21-40A



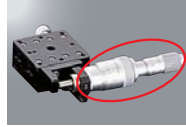
B21-60A



RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [▶P.2-009~](#)

**Precise positioning**  
Coarse-fine micrometer



※Not available □25.

**Space-saving · Prevention error**  
Feeding screw hexagonal wrench operation



※The photo shows □25.

**[Features]**

- Table size □25 · 40 · 60mm cross roller guide stage XY-axis combination type.
- Main body is light weight by aluminum-made.
- Available each option.

**Configuration**

Model	B21-	25AN	25CN	40A	40C	60A	60C	Reference page
X,Y	B11-	25AN	25CN	40A	40C	60A	60C	<a href="#">▶P.2-063~</a>

\* R (opposite-hand) means configuration for X or Y axis of R.

1 Model      Option code

**B21-25 CRN** □  
**B21-□ CR** □

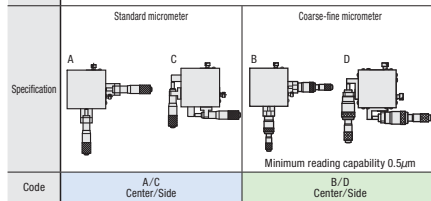
1      2      3      4

Select the option code as below.

**1 Stage table size**

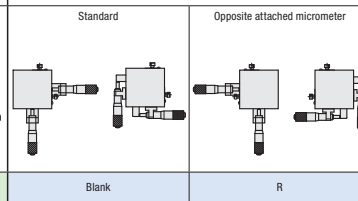
25	25×25mm
40	40×40mm
60	60×60mm

**2 Feeding position**

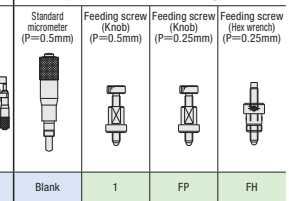


※Not available □25 for B or D.

**3 Operating position**



**4 Feeding type (Not available feeding position B/D when selecting)**



**SPEC**

Model	B21-25AN	B21-25CN	B21-40A	B21-40C	B21-60A	B21-60C
<b>(Opposite hand)</b>	B21-25ARN	B21-25CRN	B21-40AR	B21-40CR	B21-60AR	B21-60CR
Stage table size	25×25mm		40×40mm		60×60mm	
Feeding Type	Standard micrometer					
Feeding position	Center	Side	Center	Side	Center	Side
Travel distance	±3.2mm			±6.5mm		
Minimum reading of micrometer	10μm/Scale					
Guide	Cross roller guide					
Load capacity	1.0kgf [9.8N]		1.8kgf [17.6N]		4.5kgf [44.1N]	
Travel accuracy	Straightness					
	Pitching			Within 3μm		
	Yawing			Within 25"		
Allowable load for moment	Pitch			Within 15"		
	Yaw		0.4N · m			
	Roll		2.0N · m			
	Pitch		5.2N · m			
Moment rigidity	Pitch		0.4N · m			
	Yaw		2.0N · m			
	Roll		5.2N · m			
Parallelism	Pitch		4.83"/N · cm			
	Yaw		0.66"/N · cm			
	Roll		0.19"/N · cm			
Motion parallelism	Pitch		0.84"/N · cm			
	Yaw		0.66"/N · cm			
	Roll		0.19"/N · cm			
Squareness	Within 60μm					
Weight	0.08kg		0.3kg		0.52kg	
Main material—Surface finishing	Aluminum—Black alumite processing					
Provided screws (Hex socket screws)	4 of M2—6		4 of M3—6		4 of M4—6	

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

2

069

□25

□30

□40

□50

□60

□70

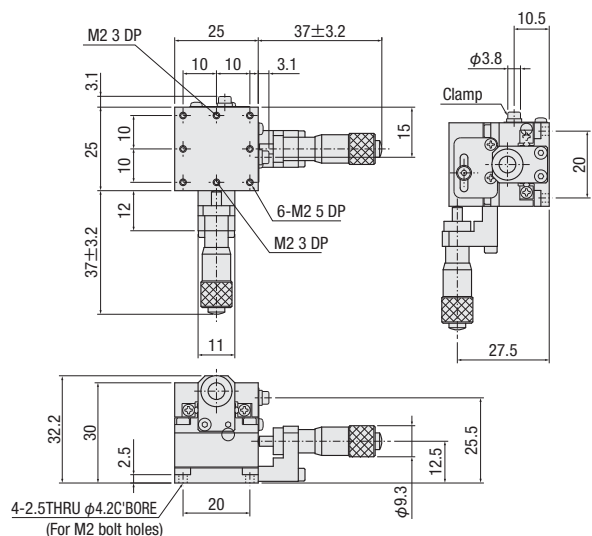
□80

□100

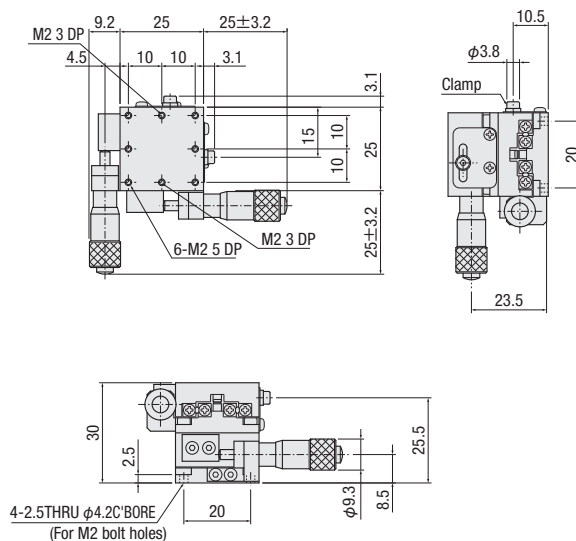
Other

Dimensional outline drawings

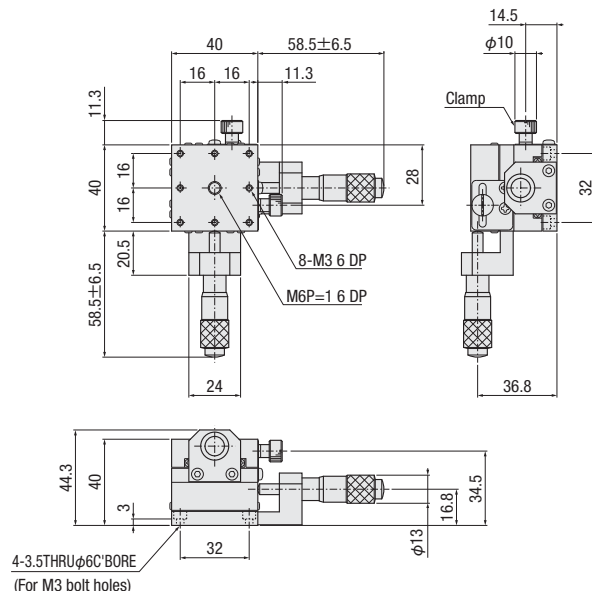
**B21-25AN**



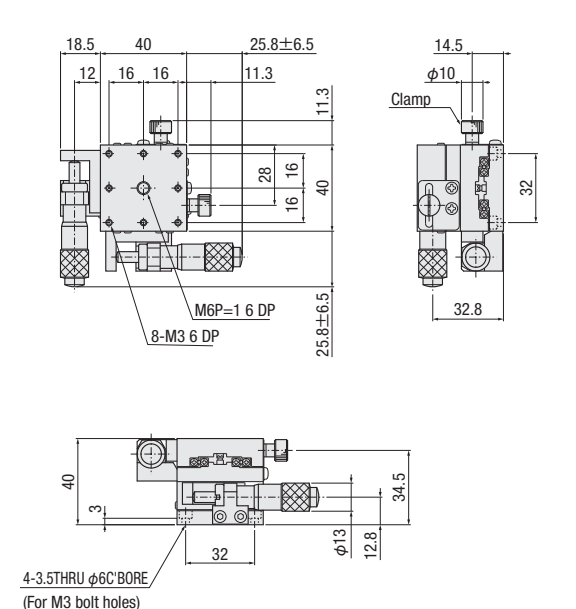
**B21-25CN**



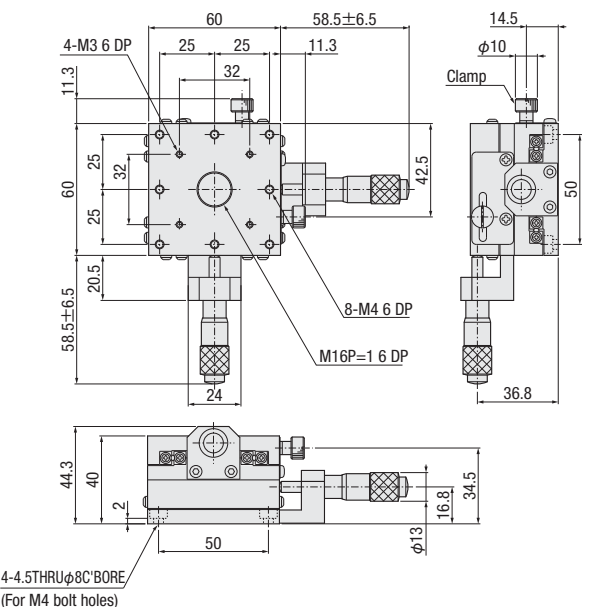
**B21-40A**



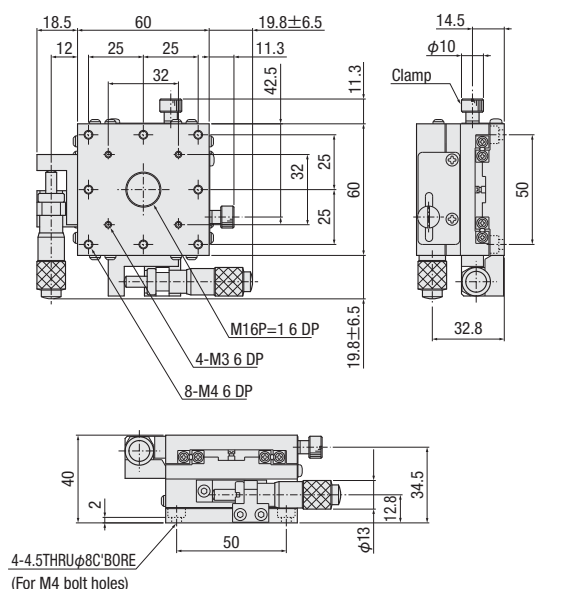
**B21-40C**



**B21-60A**



**B21-60C**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

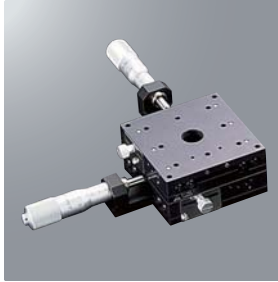
120

Other

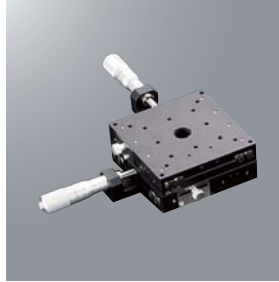


## XY-axis Cross Roller Guide Stage □80/□100/□120: B21-80/100/120

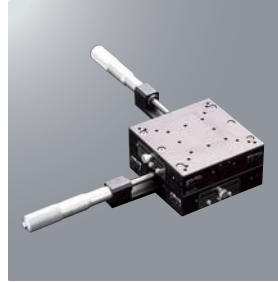
B21-80A



B21-100A



B21-120A

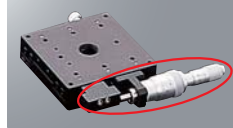


RoHS

**Optional sample** \*The photo is for illustrative purpose only.  
Please refer to optional introduction pages for details. [▶P.2-009~](#)

**Precise positioning**

Coarse-fine micrometer



※ Stroke is ±6.5mm.  
※ Not available □120.

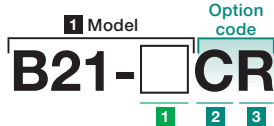
**[Features]**

- Table size □80 · 100 · 120mm cross roller guide stage XY-axis combination type.
- Main body is light weight by aluminum-made.
- Available each option.

**Configuration**

Model	B21-	80A	80C	100A	100C	120A	120C	Reference page
X,Y	B11-	80A	80C	100A	100C	120A	120C	<a href="#">▶P.2-065~</a>

\* R (opposite-hand) means configuration for X or Y axis of R.

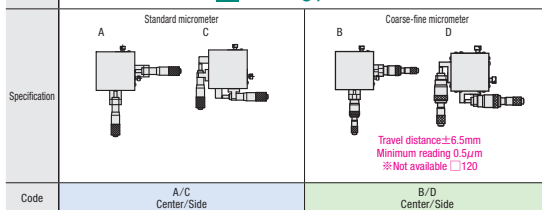


Select the option code as below.

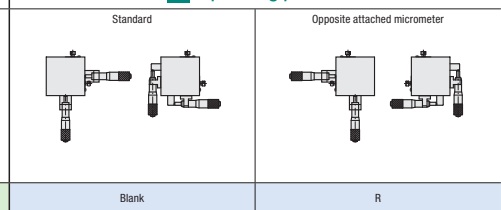
**1 Stage table size**

80	80×80mm
100	100×100mm
120	120×120mm

**2 Feeding position**



**3 Operating position**



		SPEC					
Model		B21-80A	B21-80C	B21-100A	B21-100C	B21-120A	B21-120C
(Opposite hand)		B21-80AR	B21-80CR	B21-100AR	B21-100CR	B21-120AR	B21-120CR
Stage table size		80×80mm		100×100mm		120×120mm	
Feeding Type		Standard micrometer					
Feeding position		Center	Side	Center	Side	Center	Side
Travel distance		±12.5mm				±25mm	
Minimum reading of micrometer		10μm/Scale					
Guide		Cross roller guide					
Load capacity		9.5kgf [93.1N]		14.3kgf [140.1N]		18.4kgf [180.3N]	
Travel accuracy	Straightness	Within 3μm					
	Pitching	Within 25"					
	Yawing	Within 15"					
Allowable load for moment	Pitch	17.3N · m		33.0N · m		57.2N · m	
	Yaw	15.1N · m		30.0N · m		44.7N · m	
	Roll	17.3N · m		33.0N · m		57.2N · m	
Moment rigidity	Pitch	0.09"/N · cm		0.11"/N · cm		0.04"/N · cm	
	Yaw	0.10"/N · cm		0.14"/N · cm		0.04"/N · cm	
	Roll	0.09"/N · cm		0.11"/N · cm		0.04"/N · cm	
Parallelism		Within 60μm					
Motion parallelism		Within 20μm					
Squareness		Within 10μm					
Weight		1.0kg		1.4kg		3.2kg	
Main material—Surface finishing		Aluminum—Black alumite processing					
Provided screws (Hex socket screws)		4 of M4—6				4 of M4—10	

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

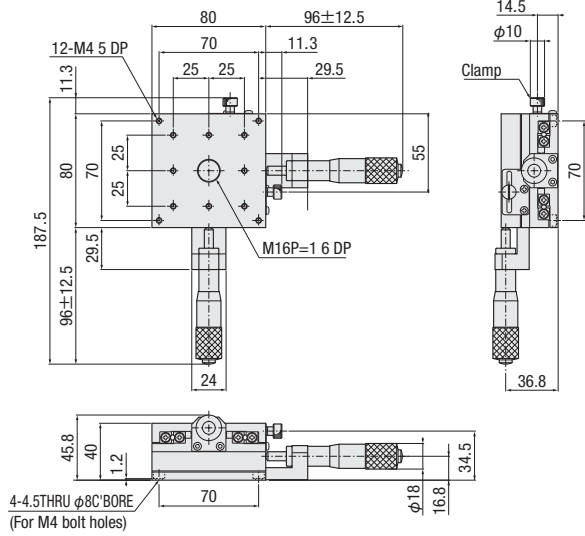
□100

□120

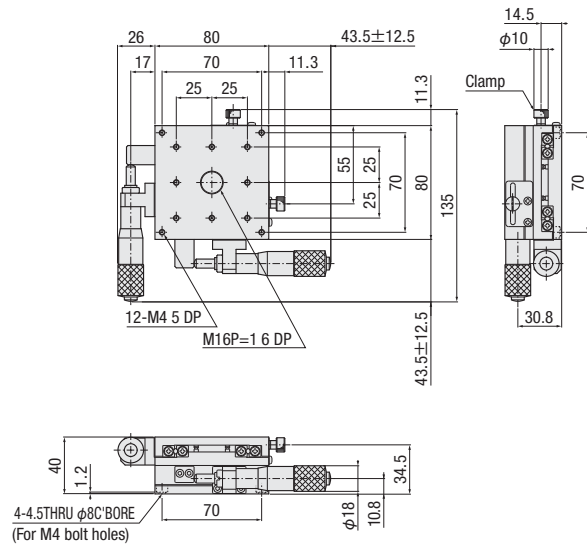
Other

Dimensional outline drawings

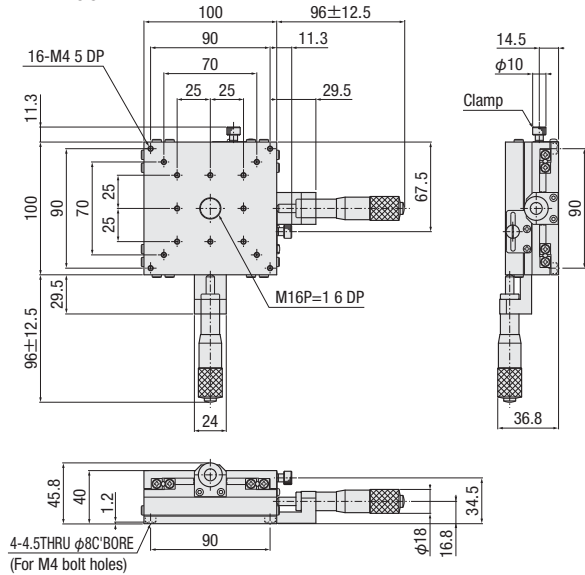
**B21-80A**



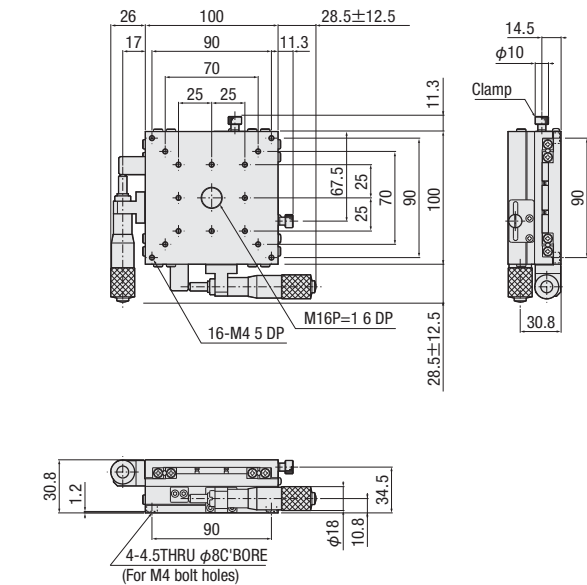
**B21-80C**



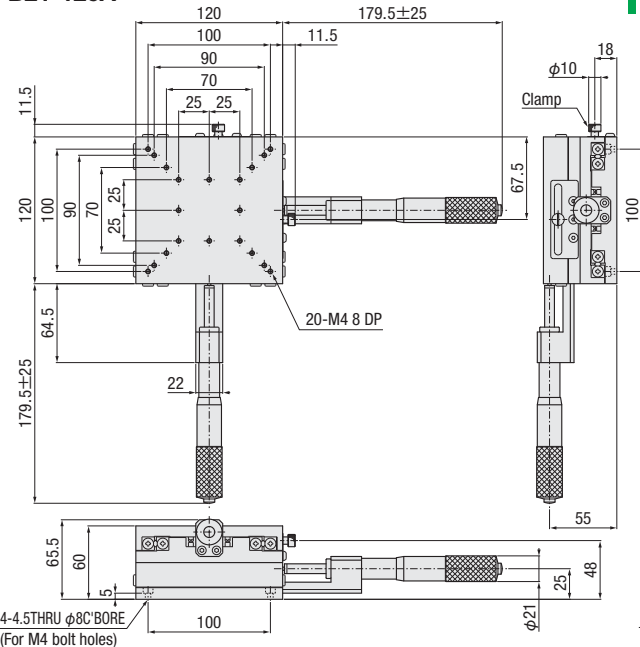
**B21-100A**



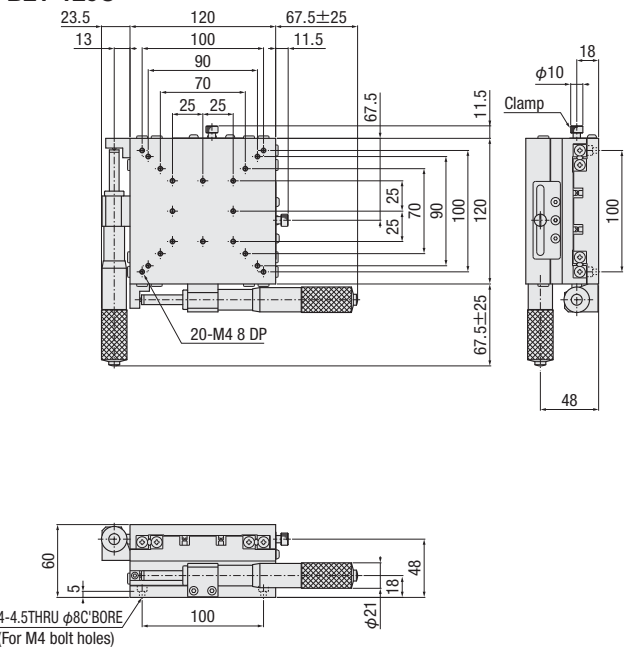
**B21-100C**



**B21-120A**



**B21-120C**



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

- Linear Ball

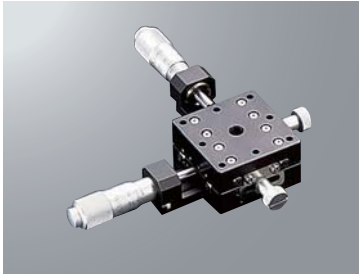
- Cross Roller

- Dovetail

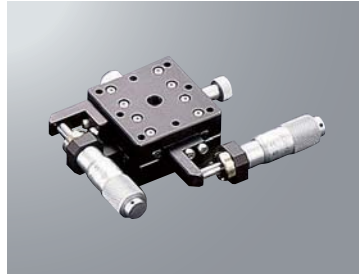
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

## Thin Type XY-axis Cross Roller Guide Stage □40/□60: B23-40/60

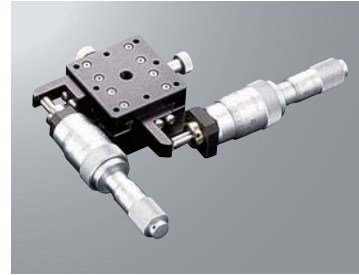
B23-40A



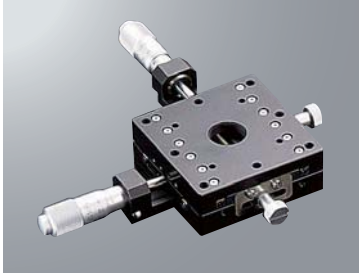
B23-40C



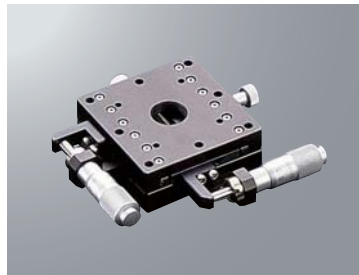
B23-40D



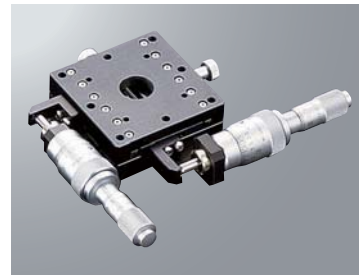
B23-60A



B23-60C



B23-60D



**[Features]**

- X and Y-axis integrated structure stage of cross roller guide.
- Reduce 18mm of thickness in comparison with XY-axis combination.
- Available opposite type.
- Available coarse-fine type.

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Linear Ball

Cross Roller

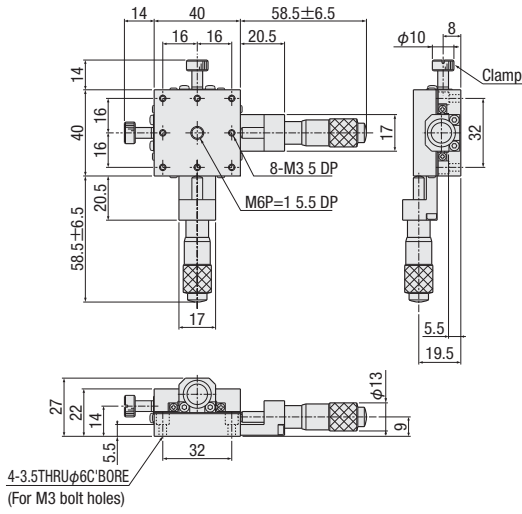
Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

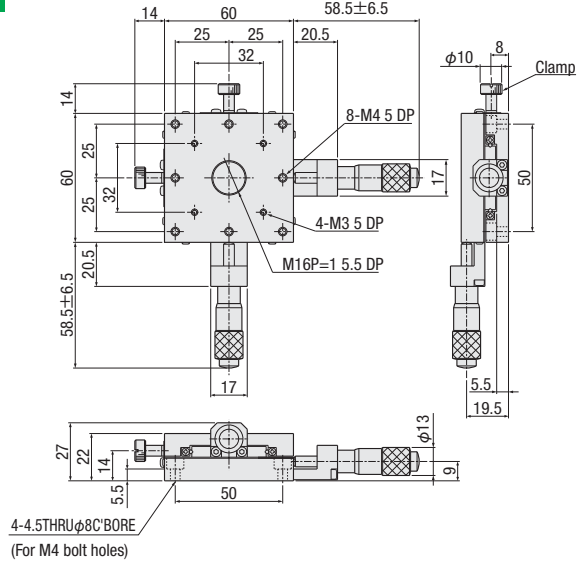
SPEC						
Model	B23-40A	B23-40C	B23-40D	B23-60A	B23-60C	B23-60D
(Opposite hand)	B23-40AR	B23-40CR	B23-40DR	B23-60AR	B23-60CR	B23-60DR
Stage table size	40×40mm			60×60mm		
Feeding position	Center	Side		Center	Side	
Travel distance	±6.5mm		Coarse motion ±6.5mm Micromotion ±0.1mm	±6.5mm		Coarse motion ±6.5mm Micromotion ±0.1mm
Minimum reading of micrometer	10μm/Scale		Coarse-micromotion 0.5μm/Scale	10μm/Scale		Coarse-micromotion 0.5μm/Scale
Guide	Cross roller guide					
Load capacity	1.0kgf [9.8N]			3.0kgf [29.4N]		
Travel accuracy	Straightness		3μm			
	Pitching		40"			
	Yawing		20"			
Allowable load for moment	Pitch		0.7N · m		2.3N · m	
	Yaw		0.8N · m		1.9N · m	
	Roll		0.7N · m		2.3N · m	
Moment rigidity	Pitch		0.57"/N · cm		0.19"/N · cm	
	Yaw		0.50"/N · cm		0.13"/N · cm	
	Roll		0.64"/N · cm		0.15"/N · cm	
Parallelism	50μm					
Motion parallelism	20μm					
Squareness	10μm					
Weight	0.2kg		0.3kg	0.4kg		0.5kg
Main material—Surface finishing	Aluminum—Black alumite processing					
Provided screws (Hex socket screws)	4 of M3—10			4 of M4—10		

**Dimensional outline drawings**

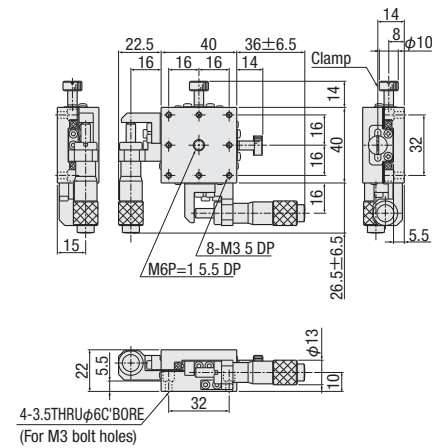
**B23-40A**



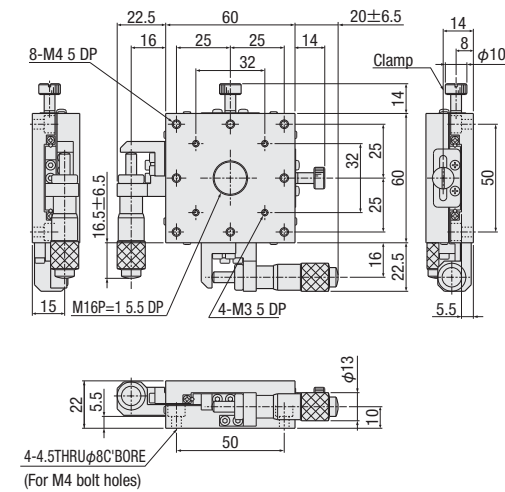
**B23-60A**



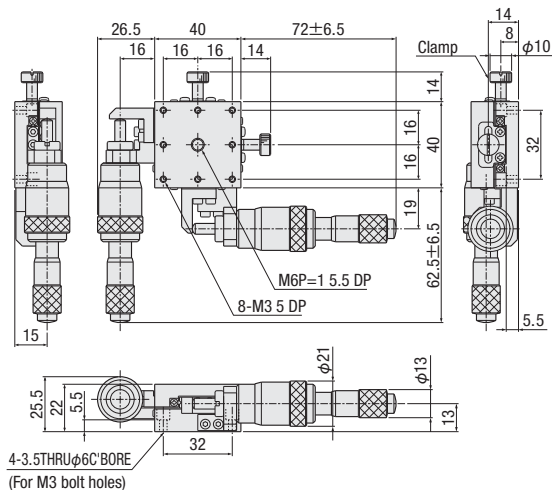
**B23-40C**



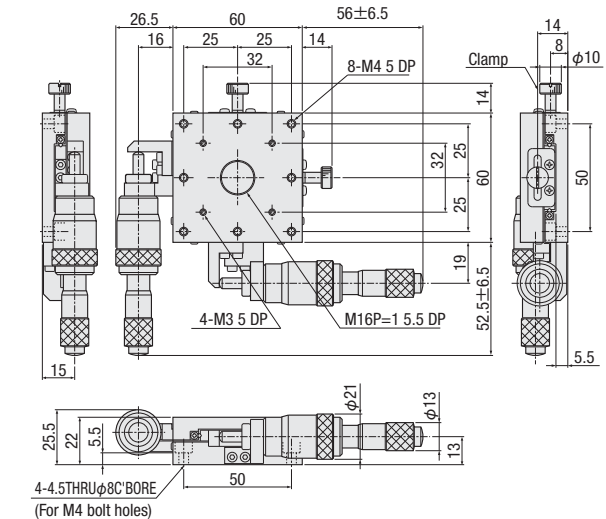
**B23-60C**



**B23-40D**



**B23-60D**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

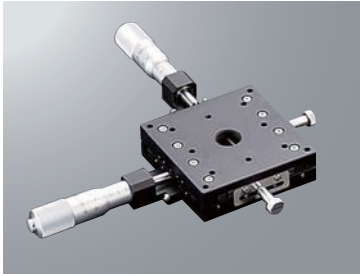
Other

2

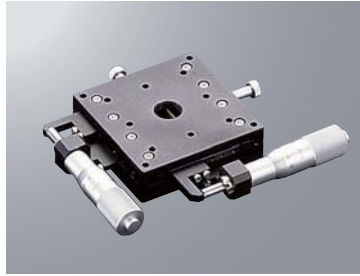
074

## Thin Type XY-axis Cross Roller Guide Stage □80/□100: B23-80/100

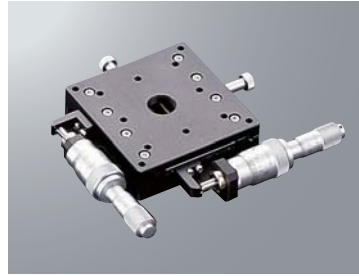
B23-80A



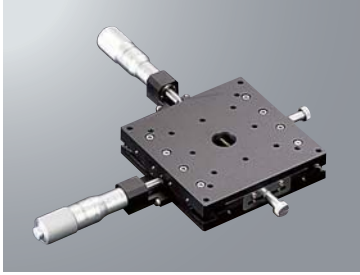
B23-80C



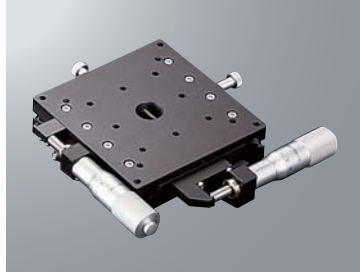
B23-80D



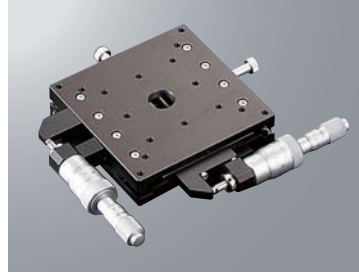
B23-100A



B23-100C



B23-100D



**[Features]**

- X and Y-axis integrated structure stage of cross roller guide.
- Reduce 18mm of thickness in comparison with XY-axis combination.
- Available coarse-micromotion type.
- Available opposite type for table size □80mm.

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Linear Ball

Cross Roller

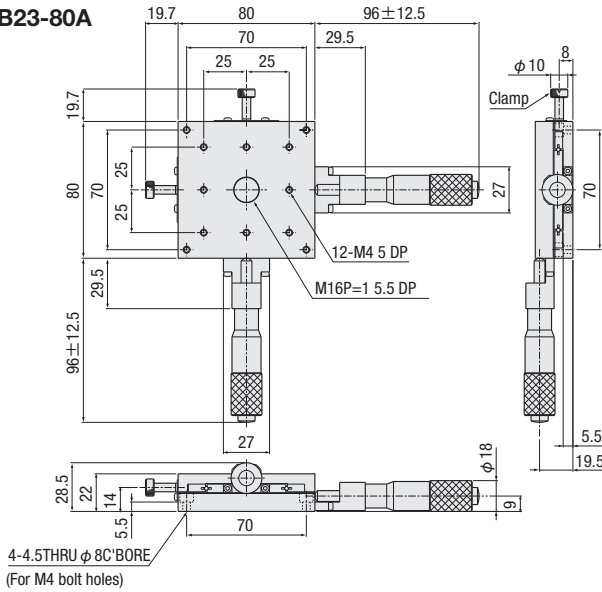
Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

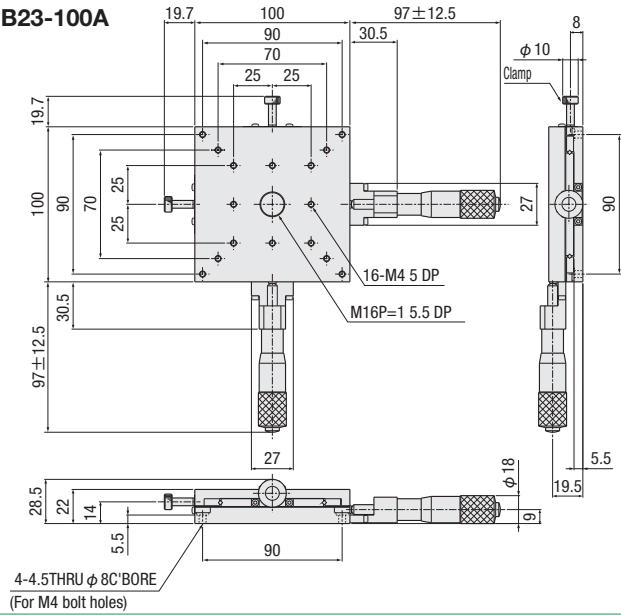
SPEC						
Model	B23-80A	B23-80C	B23-80D	B23-100A	B23-100C	B23-100D
(Opposite hand)	B23-80AR	B23-80CR	B23-80DR	—	—	—
Stage table size	80×80mm			100×100mm		
Feeding position	Center	Side		Center	Side	
Travel distance	±12.5mm		Coarse motion ±6.5mm Micromotion ±0.1mm	±12.5mm		Coarse motion ±6.5mm Micromotion ±0.1mm
Minimum reading of micrometer	10μm/Scale		Coarse-micromotion 0.5μm/Scale	10μm/Scale		Coarse-micromotion 0.5μm/Scale
Guide	Cross roller guide					
Load capacity	4.0kgf [39.2N]					
Travel accuracy	Straightness					
	Pitching					
	Yawing					
Allowable load for moment	Pitch					
	Yaw					
	Roll					
Moment rigidity	Pitch		0.13"/N · cm		0.08"/N · cm	
	Yaw		0.13"/N · cm		0.10"/N · cm	
	Roll		0.11"/N · cm		0.08"/N · cm	
Parallelism	50μm					
Motion parallelism	20μm					
Squareness	10μm					
Weight	0.7kg			1.08kg		
Main material—Surface finishing	Aluminum—Black alumite processing					
Provided screws (Hex socket screws)	4 of M4—10					

**Dimensional outline drawings**

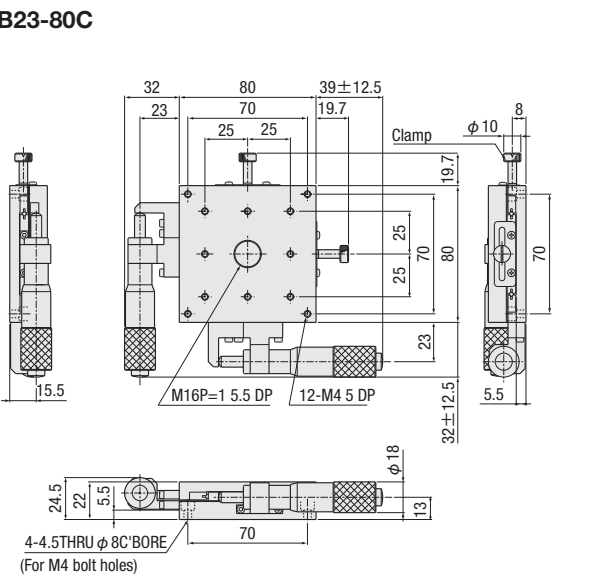
**B23-80A**



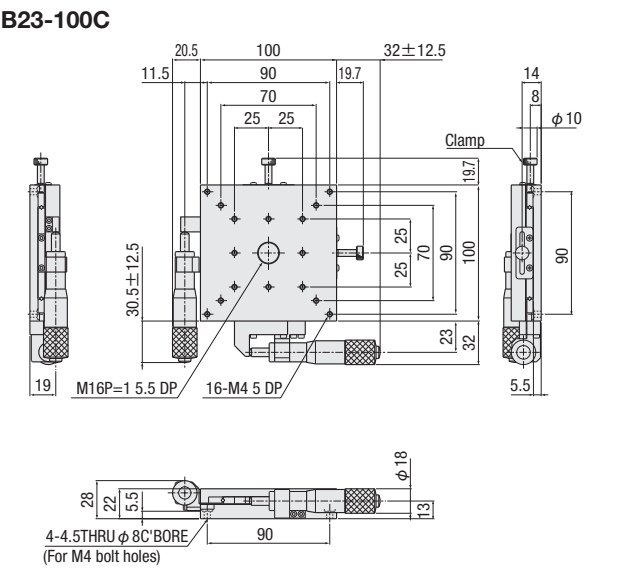
**B23-100A**



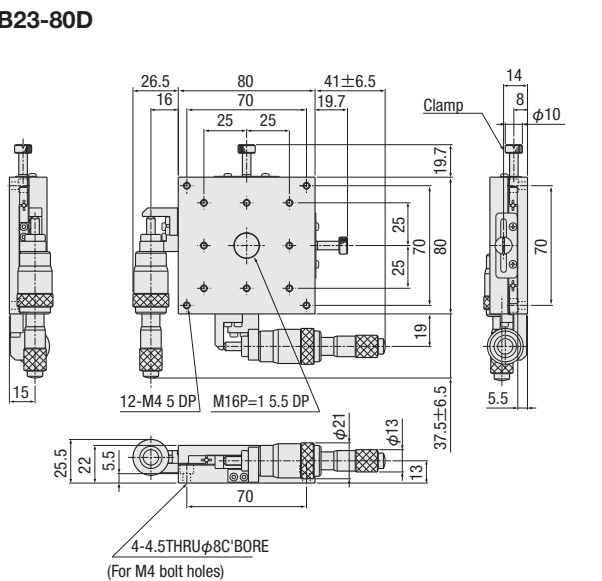
**B23-80C**



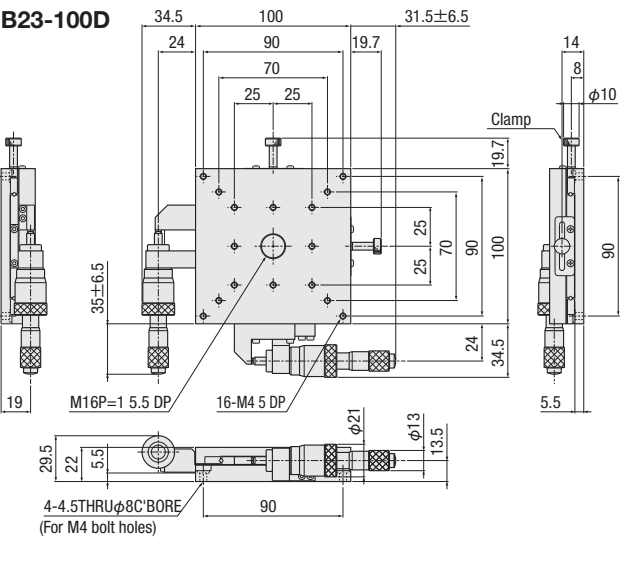
**B23-100C**



**B23-80D**



**B23-100D**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

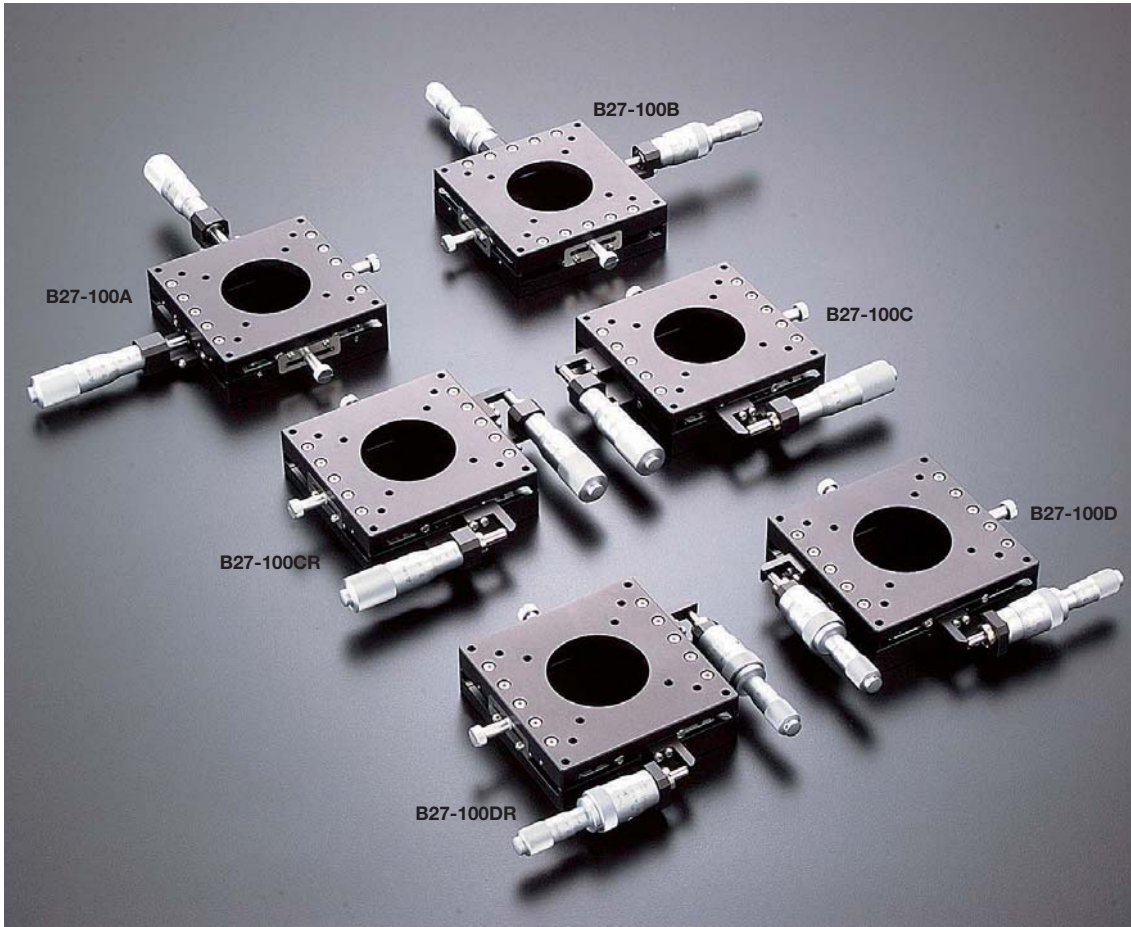
□ 120

Other

## Transmission Hole Type XY-axis Cross Roller Guide Stage □100: B27-100

Manual linear stage

RoHS



### [Features]

- X and Y-axis integrated structure stage with transmitted hole.
- Transmission hole is  $\phi 50\text{mm}$ . Can be kept  $\phi 40$  when move to XY direction. Effective diameter is  $\phi 40$  in case of travel distance  $\pm 12.5\text{mm}$ .
- Available coarse-micromotion type.

		SPEC			
Model		B27-100A	B27-100B	B27-100C	B27-100D
(Opposite hand)		B27-100AR	B27-100BR	B27-100CR	B27-100DR
Stage table size		100×100mm			
Feeding position		Center		Side	
Travel distance		$\pm 12.5\text{mm}$	Coarse motion $\pm 6.5\text{mm}$ Micromotion $\pm 0.1\text{mm}$	$\pm 12.5\text{mm}$	Coarse motion $\pm 6.5\text{mm}$ Micromotion $\pm 0.1\text{mm}$
Minimum reading of micrometer		$10\mu\text{m}/\text{Scale}$	Coarse-micromotion $0.5\mu\text{m}/\text{Scale}$	$10\mu\text{m}/\text{Scale}$	Coarse-micromotion $0.5\mu\text{m}/\text{Scale}$
Guide		V-groove rail and cross roller			
Load capacity		6.5kgf [63.7N]			
Travel accuracy	Straightness	$3\mu\text{m}$			
	Pitching	25"			
	Yawing	15"			
Allowable load for moment	Pitch	$4.6\text{N} \cdot \text{m}$			
	Yaw	$3.9\text{N} \cdot \text{m}$			
	Roll	$4.6\text{N} \cdot \text{m}$			
Moment rigidity	Pitch	$0.07''/\text{N} \cdot \text{cm}$			
	Yaw	$0.08''/\text{N} \cdot \text{cm}$			
	Roll	$0.10''/\text{N} \cdot \text{cm}$			
Parallelism		$50\mu\text{m}$			
Motion parallelism		$20\mu\text{m}$			
Squareness		$10\mu\text{m}$			
Weight		1.0kg			
Main material—Surface finishing		Aluminum—Black alumite processing			
Provided screws (Hex socket screws)		4 of M4—14			

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

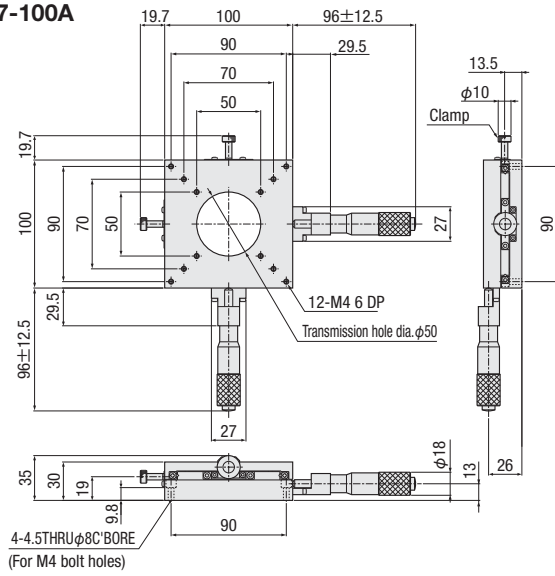
□100

□120

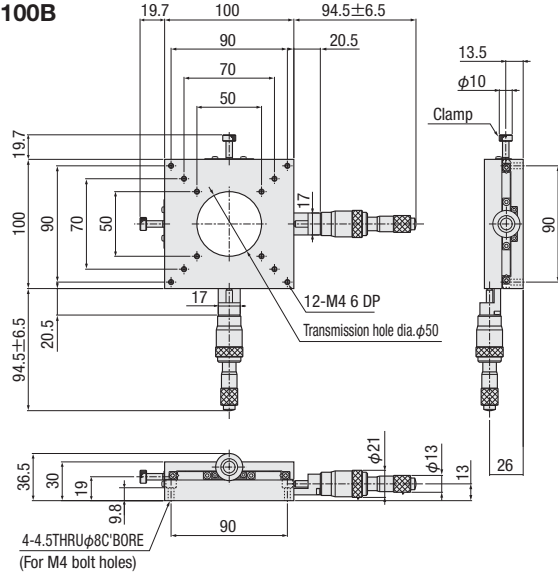
Other

**Dimensional outline drawings**

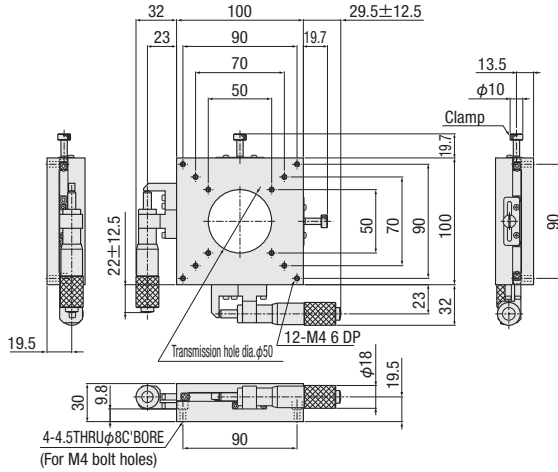
**B27-100A**



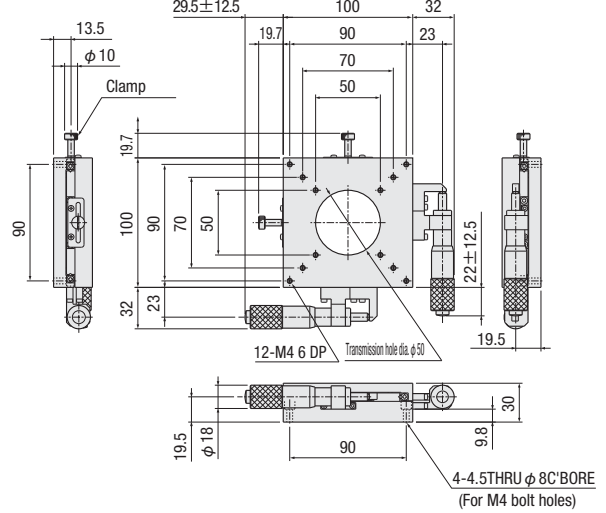
**B27-100B**



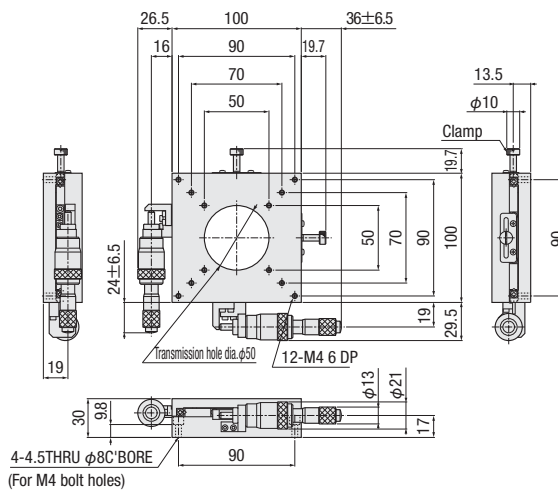
**B27-100C**



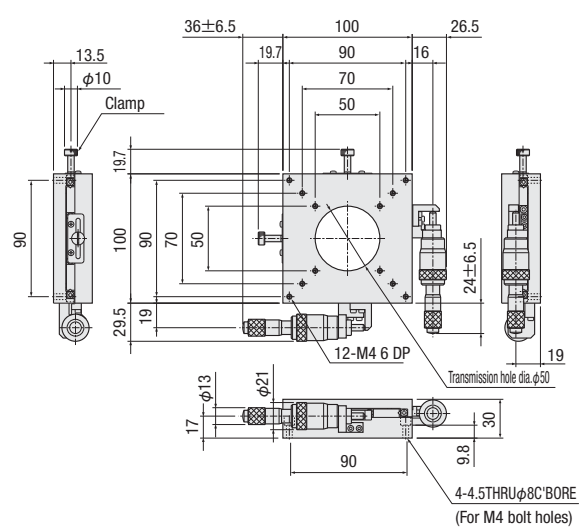
**B27-100CR**



**B27-100D**



**B27-100DR**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other



# Manual Stage

## Z-axis Cross Roller Guide Stage □25~□80: B31-25/40/60/80

B31-□A (Feeding positionA) B31-□C (Feeding positionC) B31-□CU (Feeding positionCU)



RoHS

- Stages combining X-axis cross roller guide and Z-axis bracket.
- Main body is light weight by aluminum-made.
- Selectable feeding position center pushing or side pushing.

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

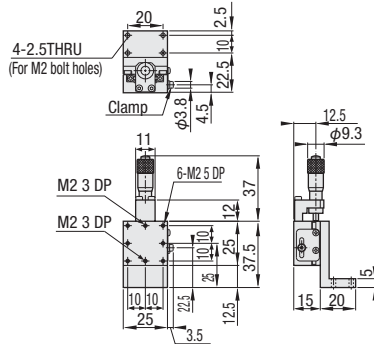
□120

Other

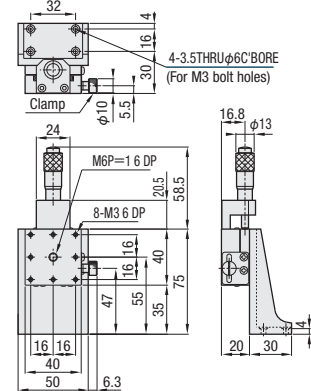
2  
079

### Dimensional outline drawings

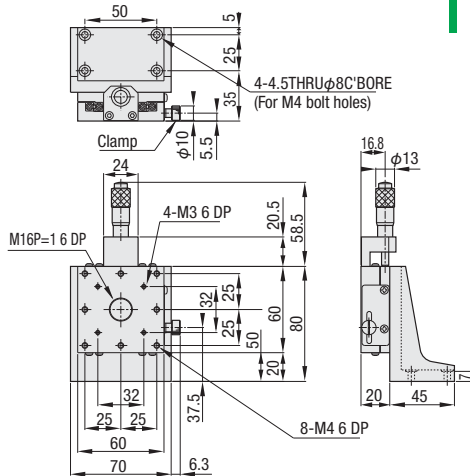
#### B31-25AN



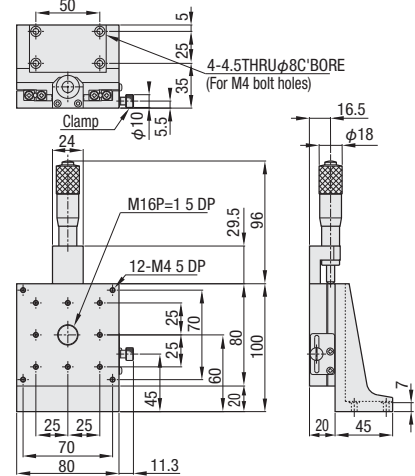
#### B31-40A



#### B31-60A

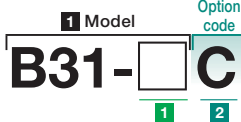


#### B31-80A



### Configuration

Model	B31-25AN	25CN	25CNU	References	40A	40C	40CU	References	60A	60C	60CU	References	80A	80C	80CU	References	
X	B11-	25ANZ	25CN	25CNZ	▶ P.2-063~	40AZ	40C	40CZ	▶ P.2-063~	60AZ	60C	60CZ	▶ P.2-063~	80AZ	80C	80CZ	▶ P.2-065~
Bracket		A47-1N			▶ P.2-179	A47-4	A47-106	▶ P.2-179		A47-5		▶ P.2-180	A47-6	A47-7	A47-6	▶ P.2-180	



Select the option code as below.

#### 1 Stage table size

25	25×25mm
40	40×40mm
60	60×60mm
80	80×80mm

#### 2 Feeding position

Specification	Center feeding position	Side looks down	Side looks up
Code	A ※□25 AN	C ※□25 CN	CU ※□25 CNU

### SPEC

Model	Feeding position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)								
				Straightness	Pitching	Yawing	Pitch	Yaw	Roll	Pitch	Yaw	Roll												
B31-	25 A: Center C: Side looks down CU: Side looks up ※ Minimum reading of micrometer 10 μm/Scale	± 3.2	0.5kgf [4.9N]	30°	30°	1.1	0.8	0.4	3.03	2.85	1.80	50 μm	15 μm	0.06	4 of M2 - 8									
																± 6.5	1.0kgf [9.8N]	2.7	2.2	2.0	0.38	0.42	0.28	4 of M3 - 8
	± 12.5	2.0kgf [19.6N]	5.2													4.3	5.5	0.12	0.11	0.07	80 μm	30 μm	0.45	4 of M4 - 12
	± 12.5	5.0kgf [49N]	19.2													15.1	17.3	0.05	0.05	0.04			0.80	

• Main material: Aluminum • Surface finishing: Black alumite processing

SURUGA SEIKI

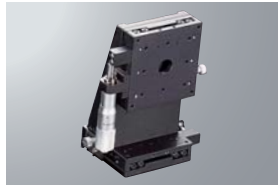
CAD 3D·2D

# XZ-axis Cross Roller Guide Stage □25~□80: B61-25/40/60/80

B61-□A (Feeding position A)



B61-□C (Feeding position C)



RoHS

- Stages combining X and Z-axis cross roller guide.
- Main body is light weight by aluminum-made.
- Selectable feeding position center pushing or side pushing.

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

2

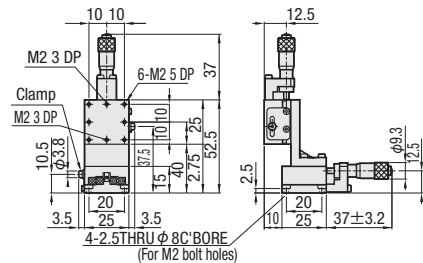
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## Dimensional outline drawings

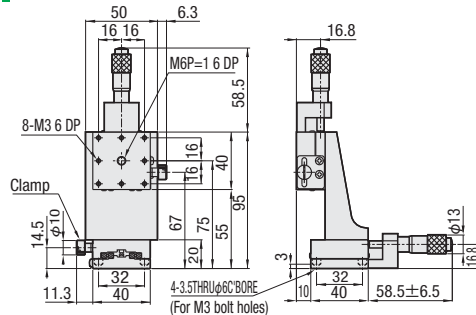
SURUGA SEIKI

CAD 3D·2D

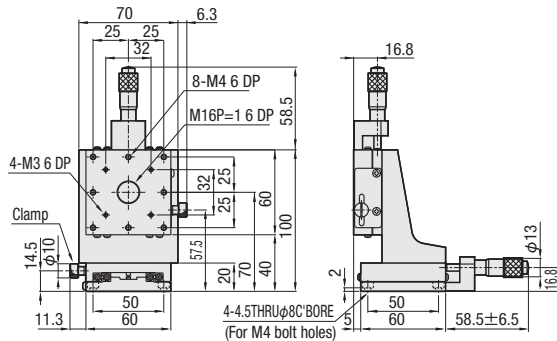
B61-25AN



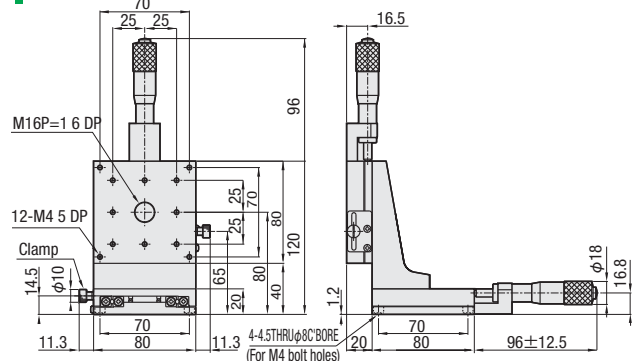
B61-40A



B61-60A



B61-80A



## Configuration

Model	B61-	25AN	25CN	References	40A	40C	References	60A	60C	References	80A	80C	References
Z	B31-	25AN	25CN	● P.2-079	40A	40C	● P.2-079	60A	60C	● P.2-079	80A	80C	● P.2-079
X	B11-	25AN	25CN	● P.2-063~	40A	40C	● P.2-063~	60A	60C	● P.2-063~	80A	80C	● P.2-065~

## 1 Model

Option code  
**B61-□C**

Select the option code as below.

## 1 Stage table size

25	25×25mm
40	40×40mm
60	60×60mm
80	80×80mm

## 2 Feeding position

Specification	Center feeding position	Side looks down
Code	A ※□25 AN	C ※□25 CN

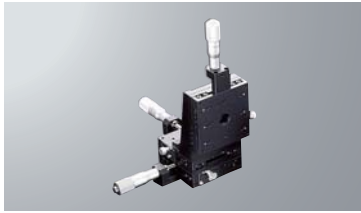
## SPEC

Model	Feeding position	Travel distance (mm)	Load capacity	Allowable load for moment (N·m)			Moment rigidity (1/N·cm)			Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)											
				Pitch	Yaw	Roll	Pitch	Yaw	Roll														
B61-	25	A: Center	± 3.2	0.5kgf [4.9N]	1.1	0.4	0.4	6.06	4.65	4.65	80 μm	25 μm	0.1	4 of M2 - 6									
	40	C: Side													± 6.5	1.0kgf [9.8N]	2.7	2.0	2.0	0.76	0.70	0.70	4 of M3 - 6
	60	※ Minimum reading of micrometer 10 μm/Scale																					
80																							

• Main material: Aluminum • Surface finishing: Black alumite processing

## XYZ-axis Cross Roller Guide Stage □25~□80: B71-25/40/60/80

B71-□A (Feeding positionA)



B71-□C (Feeding positionC)



RoHS

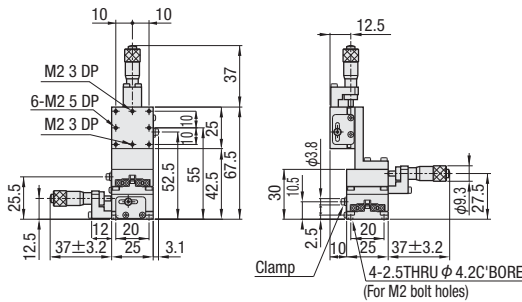
- Stages combining XY-axis cross roller guide and Z-axis bracket.
- Main body is light weight by aluminum-made.
- Selectable feeding position center pushing or side pushing.

### Dimensional outline drawings

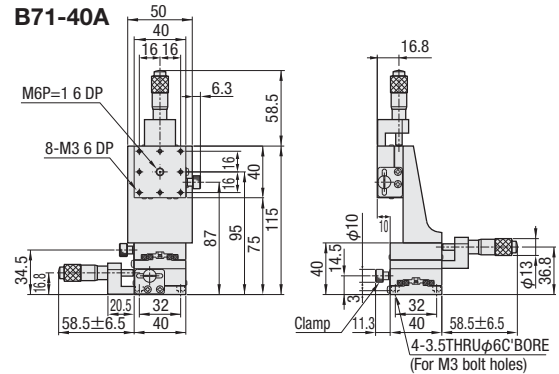
**SURUGA SEIKI**

CAD 3D·2D

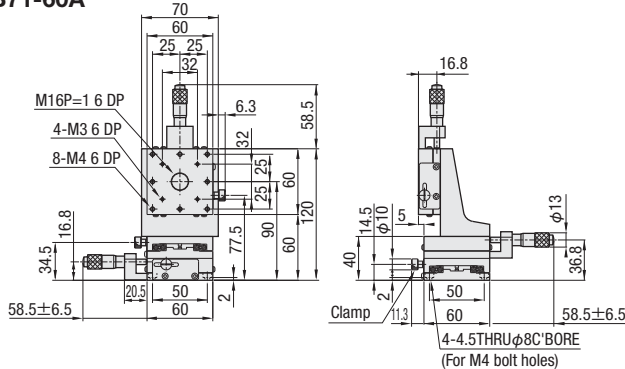
B71-25AN



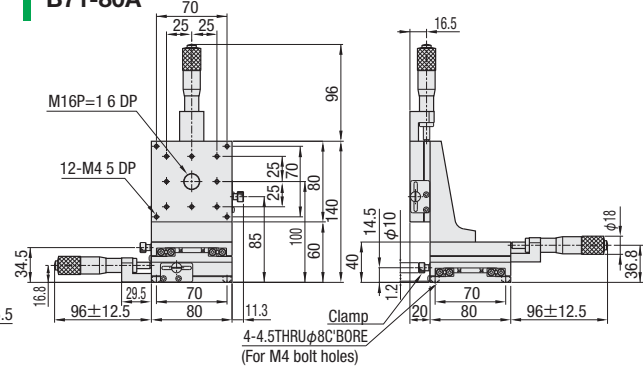
B71-40A



B71-60A



B71-80A



### Configuration

Model	B71-	25AN	25CN	Reference page	40A	40C	Reference page	60A	60C	Reference page	80A	80C	Reference page
Z	B31-	25AN	25CN	▶ P.2-079	40A	40C	▶ P.2-079	60A	60C	▶ P.2-079	80A	80C	▶ P.2-079
X, Y	B11-	25AN	25CN	▶ P.2-069 ~	40A	40C	▶ P.2-069 ~	60A	60C	▶ P.2-069 ~	80A	80C	▶ P.2-071 ~

### 1 Model

**B71-□C**

Option code

Select the option code as below.

### 1 Stage table size

25	25×25mm
40	40×40mm
60	60×60mm
80	80×80mm

### 2 Feeding position

Specification	Center feeding position	Side looks down
Image		
Code	A ※□25 AN	C ※□25 CN

SPEC		Main material: Aluminum						Surface finishing: Black alumite processing						
Model	Feeding position	Travel distance (mm)	Load capacity	Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)	
				Pitch	Yaw	Roll	Pitch	Yaw	Roll					
B71-	25	A: Center C: Side	± 3.2	0.5kgf [4.9N]	0.4	0.4	0.4	7.68	7.50	7.86	140 μm	50 μm	0.14	4 of M2 - 6
	40	± 6.5	1.0kgf [9.8N]	2.0	2.0	2.0	1.08	1.12	1.04	0.52			4 of M3 - 6	
	60	± 12.5	2.0kgf [19.6N]	4.3	4.3	5.2	0.30	0.29	0.31	0.98			4 of M4 - 6	
	80	± 12.5	5.0kgf [49N]	15.1	15.1	17.3	0.14	0.14	0.14	1.84 ※ C: 1.97				

# Horizontal Z-axis Cross Roller Guide Stage □25□40□60: B33-25/40/60

**B33-60A**



**[Features]**

- B33 series is cross roller guide stage that moves its surface up and down.
- A structure to transmit feeding of the micrometer using leverage.
- The end of model number "KG-" is high rigidity type.
- Available coarse-fine motion type.

※□70, 80 and B37 (micrometer pushing directly type・□60) shows next page P.2-083

RoHS

**SURUGA SEIKI**

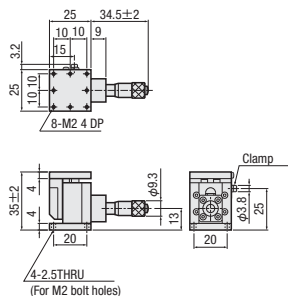
CAD 3D・2D

**Dimensional outline drawings**

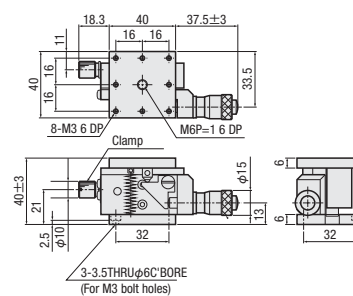
**B33-60KGA**



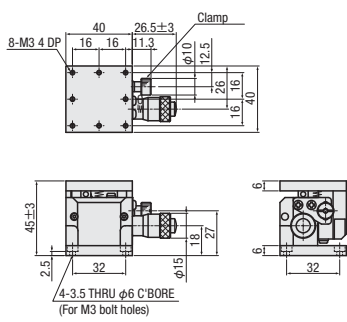
**B33-25A**



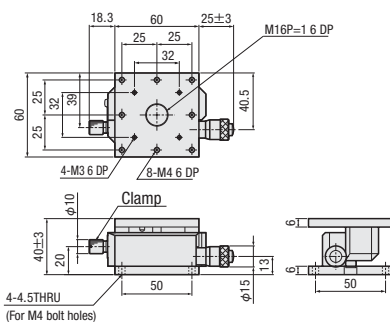
**B33-40A**



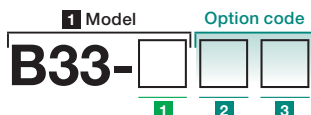
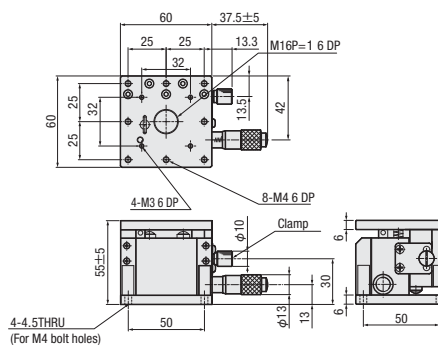
**B33-40KGA**



**B33-60A**



**B33-60KGA**



Select the option code as below.

**1 Stage table size**

25	25×25mm
40	40×40mm
60	60×60mm

**2 Type**

Blank	Standard
KG	High rigidity

**3 Feeding position**

A	Standard micrometer
B	Coarse-fine micrometer

- Ⓜ Only A is applicable for B33-25.
- Ⓜ Not available KGB for B33-40.

Low prices  
Linear ball guide  
BHE series



P.2-055~

SPEC									
Model	B33-25A	B33-40A	B33-40B	B33-40KGA	B33-60A	B33-60B	B33-60KGA	B33-60KGB	
Stage table size	25×25mm	40×40mm			60×60mm				
Travel distance	±2.0mm	±3.0mm	Coarse motion±3.0mm Fine motion±0.1mm		±3.0mm	Coarse motion±3.0mm Fine motion±0.1mm		Coarse motion±5.0mm Fine motion±0.1mm	
Minimum reading of micrometer	10μm/Scale		Coarse motion 10μm Fine motion 0.5μm		10μm/Scale		10μm/Scale	Coarse motion 10μm Fine motion 0.5μm	
Guide	Cross roller guide								
Load capacity	1.0kgf [9.8N]			2.0kgf [19.6N]	2.0kgf [19.6N]		4.0kgf [39.2N]		
Travel accuracy	Motion straightness 3μm								
Allowable load for moment	Pitch	0.7N·m	2.3N·m	2.3N·m	3.6N·m	2.3N·m	2.3N·m	6.2N·m	6.2N·m
	Yaw	0.5N·m	1.5N·m	1.5N·m	2.2N·m	1.5N·m	1.5N·m	4.1N·m	4.1N·m
	Roll	0.5N·m	2.0N·m	2.0N·m	2.4N·m	4.2N·m	4.2N·m	6.2N·m	6.2N·m
Moment rigidity	Pitch	4.08"/N·cm	1.96"/N·cm	1.96"/N·cm	1.03"/N·cm	1.01"/N·cm	1.01"/N·cm	0.11"/N·cm	0.11"/N·cm
	Yaw	2.50"/N·cm	1.63"/N·cm	1.63"/N·cm	0.52"/N·cm	0.72"/N·cm	0.72"/N·cm	0.23"/N·cm	0.23"/N·cm
	Roll	2.37"/N·cm	0.97"/N·cm	0.97"/N·cm	0.6"/N·cm	0.21"/N·cm	0.21"/N·cm	0.17"/N·cm	0.17"/N·cm
Parallelism	50μm		100μm						
Motion varticality	15μm		20μm						
Weight	0.06kg	0.2kg	0.3kg	0.2kg	0.3kg	0.4kg	0.6kg	0.6kg	
Main material—Surface finishing	Aluminum—Black alumite processing								
Provided screws (Hex socket screws)	4 of M2—8		4 of M3—6		4 of M4—10				

※Lifting quantity error may occur by stroke position due to principle of leverage.

Manual linear stage

X  
XY  
Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

## Horizontal Z-axis Cross Roller Guide Stage □60□70□80: B33-70/80, B37-60

**B33-70KGA**



- B33 series is cross roller guide stage that moves its surface up and down.
- A structure to transmit feeding of the micrometer using leverage.
- The end of model number "KG-" is high rigidity type.
- Available coarse-fine motion type.
- B37-60 moves working face up and down with micrometer.
- Can be kept long travel distance in comparison with B33 series.

※ □25~□60 (leverage type) shows the previous page P.2-082

R o H S

**SURUGA SEIKI**

CAD 3D·2D

**Dimensional outline drawings**

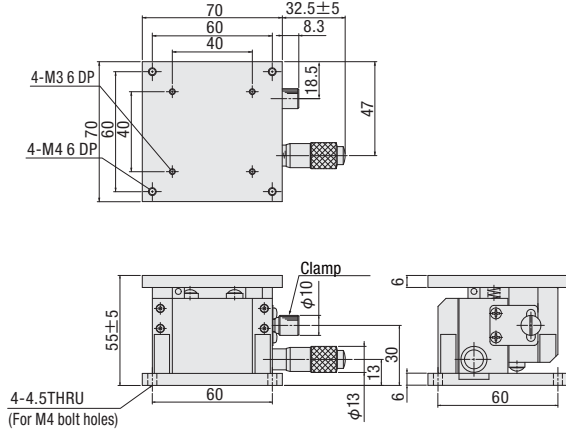
**B33-80A**



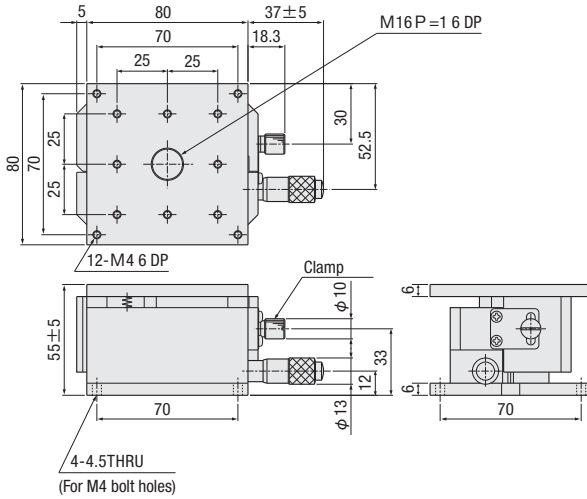
**B37-60**



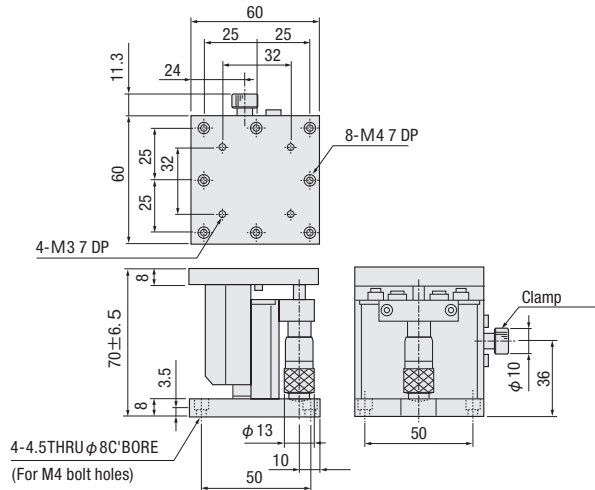
**B33-70KGA**



**B33-80A**



**B37-60**



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball

**Cross Roller**

**Dovetail**

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

**Model** **Option code**

**B33-** □ □ □

1 2 3

Please select option below.

Micrometer pushing directly type

**B37-60**

**1 Stage table size**

70	70×70mm
80	80×80mm

**2 Type**

Blank	Standard
KG	High rigidity

**3 Feeding position**

A	Standard micrometer
B	Coarse-fine micrometer

⊗ Only KGA · KGB available for B33-70.  
⊗ Available only A · B for B33-80.

Low prices

Linear ball guide BHE series



P.2-055~

**SPEC**

Model	Stage table size (mm)	Travel distance (mm)	Minimum reading of micrometer	Load capacity	Travel accuracy			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Parallelism (Within)	Motion verticality (Within)	Weight (kg)	Main material — Surface finishing	Provided screws (Hex socket screws)
					Motion straightness	Pitch	Yaw	Pitch	Yaw	Roll	Pitch	Yaw	Roll					
B33-	70KGA	70×70	±5.0	10μm/Scale	3μm	6.2	4.1	6.2	0.11	0.23	0.17	100 μm	20 μm	0.6	Aluminum— White Alumite finishing	4 of M4—10		
			Coarse motion ±5.0mm Fine motion ±0.1mm	Coarse motion 10μm Fine motion 0.5μm													4.0kgf [39.2N]	
	80A	80×80	±5.0	10μm/Scale	3.0kgf [29.4N]	3.8	2.5	6.3	0.55	0.22	0.06	1.0	Aluminum— Black alumite processing					
			Coarse motion ±5.0mm Fine motion ±0.1mm	Coarse motion 10μm Fine motion 0.5μm	3.0kgf [29.4N]													
B37-60	60×60	±6.5	10μm/Scale	5.0kgf [49N]	8.3	5.7	6.3	0.39	0.25	0.16	0.5		4 of M4—8					

※Lifting quantity error may occur by stroke position due to principle of leverage.

# Horizontal XZ-axis Cross Roller Guide Stage □25~□80: B63-25/40/60/80

B63-□A  
(Feeding position A)



B63-□C  
(Feeding position C)



- Stages combining X-axis cross roller and horizontal Z-axis.
- Selectable micrometer center pushing or side pushing.
- Available opposite hand type.

RoHS

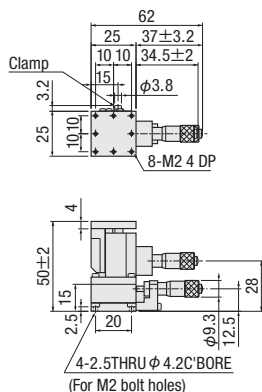
**SURUGA SEIKI**

CAD 3D·2D

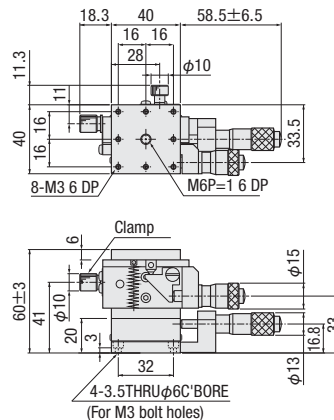
## Dimensional outline drawings

※See CAD data for more details.

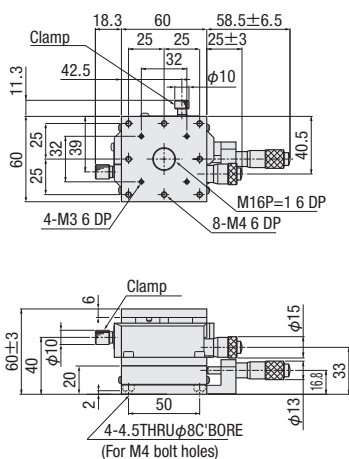
### B63-25A



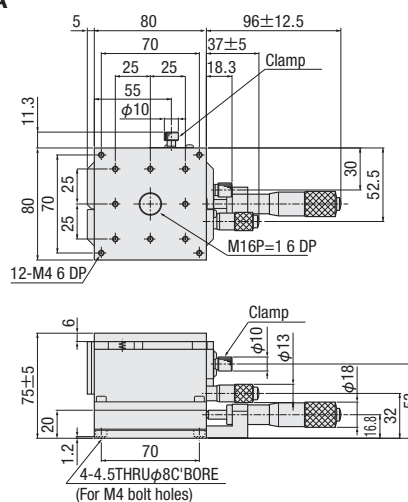
### B63-40A



### B63-60A



### B63-80A



## Configuration

Model	B63-	25A	25C	40A	40C	60A	60C	Reference page	80A	80C	Reference page
Z	B33-		25A		40A		60A	▶ P.2-082	80A		▶ P.2-083
X	B11-	25AN	25CN	40A	40C	60A	60C	▶ P.2-063~	80A	80C	▶ P.2-065~

1 Model Option code

**B63-□C**

1 2 3 Select the option code as below.

### 1 Stage table size

25	25×25mm
40	40×40mm
60	60×60mm
80	80×80mm

### 2 Feeding position

Specification	Feeding position		Operating position	
	Center	Side	Standard	Opposite attached micrometer
Code	A	C	Blank	R

※ Only X-axis is opposite for R.

## SPEC

• Main material: Aluminum • Surface finishing: Black alumite processing

Model	Feeding position	Opposite type	Travel distance (mm)		Load capacity	Allowable load for moment (N·m)			Moment rigidity ("/N·cm)			Parallelism (Within)	Motion varjaticity (Within)	Weight (kg)	Provided screws (Hex socket screws)				
			X-axis	Z-axis		Pitch	Yaw	Roll	Pitch	Yaw	Roll								
B63-	25	A: Center C: Side	Blank: Standard R: Opposite attached micrometer	± 3.2	± 2.0	1.0kgf [9.8N]	0.7	0.5	0.4	7.11	5.22	4.3	80 μm	25 μm	0.10	4 of M2 - 6			
	40			± 6.5	± 3.0		2.0kgf [19.6N]	1.5	2.0	2.0	2.01	1.39					2.24	0.35	4 of M3 - 6
	60			± 12.5	± 5.0			3.0kgf [29.4N]	2.5	6.3	3.8	0.84					0.32		
80									0.27	0.11	0.59	1.48※							

※ 1.47kg for B63-80C · CR

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

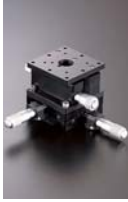
Other

2

084

## Horizontal XYZ-axis Thin Type Cross Roller Guide Stage □40□60□80: B72-40/60/80

B72-□A  
(Feeding positionA)



B72-□C  
(Feeding positionC)



- Stages combining thin type XY-axis cross roller guide and horizontal Z-axis.
- Selectable micrometer center pushing or side pushing.
- Available opposite type.

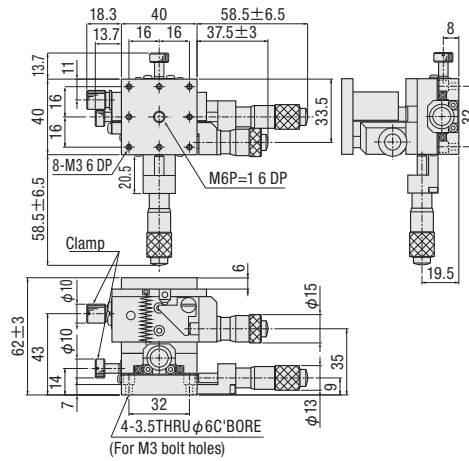
RoHS

**SURUGA SEIKI**

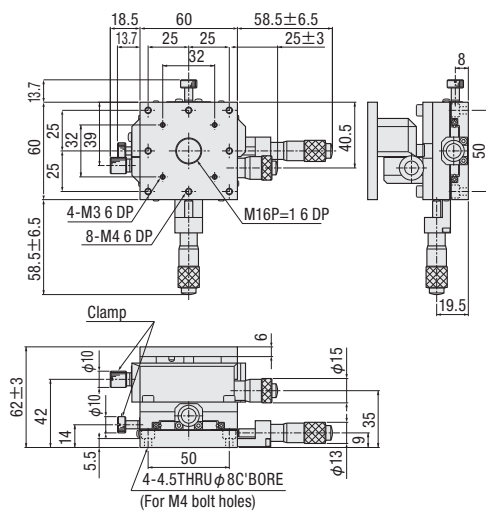
CAD  
3D·2D

### Dimensional outline drawings

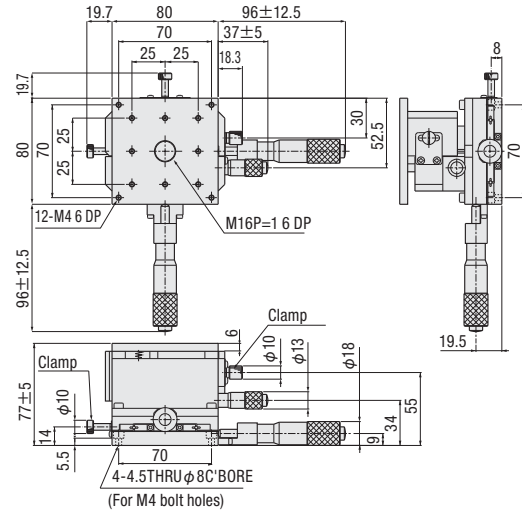
#### B72-40A



#### B72-60A



#### B72-80A



### Configuration

Model	B72-40A	40C	60A	60C	Reference page	80A	80C	Reference page
Z	B33-	40A		60A	● P.2-082	80A		● P.2-083
XY	B23-	40A	40C	60A	● P.2-073 ~	80A	80C	● P.2-075 ~

1 Model      Option code

**B72-□CR**

Select the option code as below.

#### 1 Stage table size

40	40×40mm
60	60×60mm
80	80×80mm

#### 2 Feeding position

Specification	Center		Side		Operating position			
	Center	Side	Standard	Opposite attached micrometer	Standard	Opposite attached micrometer	Standard	Opposite attached micrometer
Code	A	C	Blank		R			

※Only XY-axis is opposite for R.

SPEC		Main material: Aluminum · Surface finishing: Black alumite processing																
Model	Feeding position	Operating position	Travel distance (mm)		Load capacity	Allowable load for moment (N · m)			Moment rigidity (° / N · cm)			Parallelism (Within)	Motion vorticality (Within)	Weight (kg)	Provided screws (Hex socket screws)			
			XY-axis	Z-axis		Pitch	Yaw	Roll	Pitch	Yaw	Roll							
B72-	40	A: Center C: Side	Blank: Standard R: Opposite attached micrometer	± 6.5	± 3.0	0.8kgf [7.8N]	0.7	0.8	0.7	2.20	1.47	2.60	150 μ m	30 μ m	0.41	4 of M3 - 10		
	60			± 6.5	± 3.0	2.0kgf [19.6N]	1.5	1.9	2.3	0.91	0.34	1.16					0.75	4 of M4 - 10
	80			± 12.5	± 5.0	2.8kgf [27.4N]	2.5	4.2	3.8	0.35	0.19	0.66						



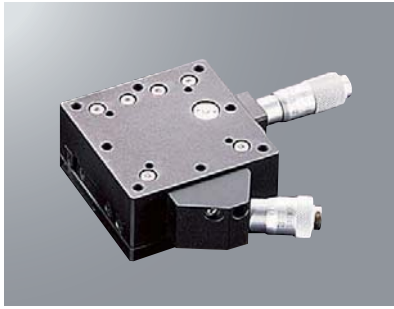


# Manual Stage

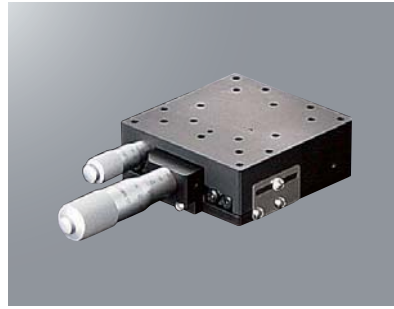
## High Resolution X-axis Cross Roller Guide Stage □60/□80: B10-60/80

Manual linear stage

B10-60LN



B10-80

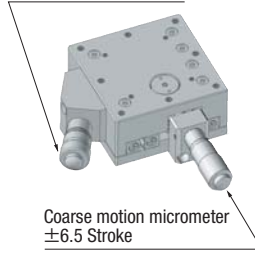


RoHS

### [Features]

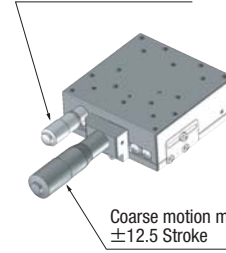
- Operatable coarse-fine motion with two micrometers.
- Travel distance: B10-60 Coarse motion  $\pm 6.5\text{mm}$ .  
B10-80 Coarse motion  $\pm 12.5\text{mm}$ .
- Adjustable within  $\pm 0.3\text{mm}$  from the position moved in coarse motion by fine motion micrometer.

Micromotion micrometer  
 $\pm 0.3$  Stroke



Coarse motion micrometer  
 $\pm 6.5$  Stroke

Micromotion micrometer  
 $\pm 0.3$  Stroke



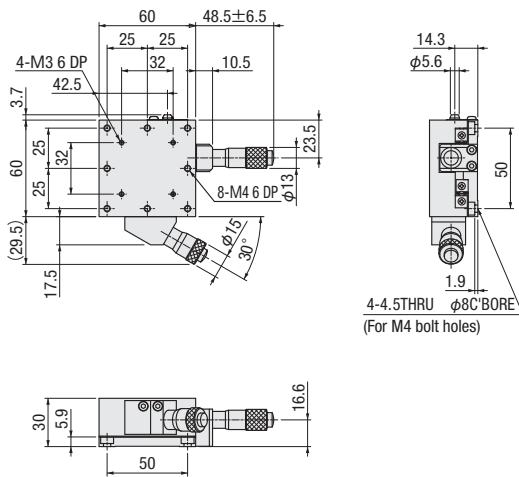
Coarse motion micrometer  
 $\pm 12.5$  Stroke

### Dimensional outline drawings

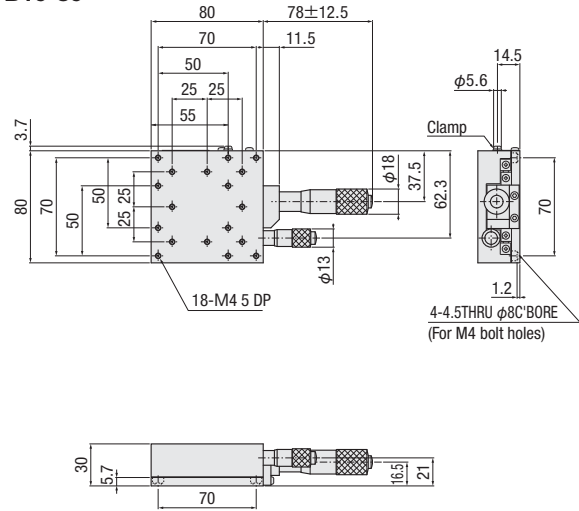
**SURUGA SEIKI**

CAD  
3D·2D

B10-60LN



B10-80



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

### 1 Model

**B10-□LN**

Option code

※ The end of model number N for only □60. Select the option code as below.

### 1 Stage table size

60	60×60mm
80	80×80mm

### 2 Operating position

Specification	Available only □60	Available only □60	Available only □80
Code	L	R	Blank

### SPEC

• Main material: Aluminum • Surface finishing: Black alumite processing

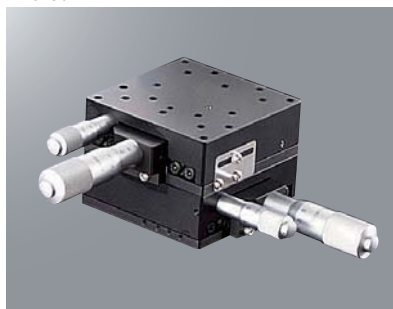
Model	Operating position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Parallelism (Within)	Motion parallelism (Within)	Weight (kg)	Provided screws (Hex socket screws)
				Straightness	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll				
B10-	60	LN: Standard R/L: Opposite attached micrometer	coarse motion $\pm 6.5$ micromotion $\pm 0.3$ 5.0kgf [49.0N]	2 $\mu\text{m}$	20"	10"	8.6	6.4	5.6	0.11	0.10	0.11	30 $\mu\text{m}$	10 $\mu\text{m}$	0.4	4 of M4 - 6
	80	Blank: Standard	coarse motion $\pm 12.5$ micromotion $\pm 0.3$ 6.0kgf [58.8N]				11.5	9.1	10.4	0.14	0.10	0.04			0.7	

# High Resolution XY-axis Cross Roller Guide Stage □60/□80: B20-60/80

B20-60LN



B20-80

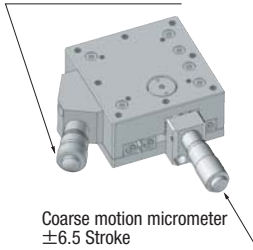


RoHS

**[Features]**

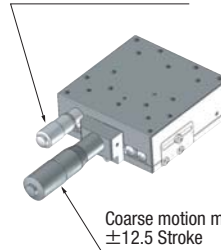
- Operatable coarse-fine motion with two micrometers.
- Travel distance: B20-60 Coarse motion ±6.5mm. B20-80 Coarse motion ±12.5mm.
- Adjustable within ±0.3mm from the position moved in coarse motion by fine motion micrometer.

Micromotion micrometer ±0.3 Stroke



Coarse motion micrometer ±6.5 Stroke

Micromotion micrometer ±0.3 Stroke



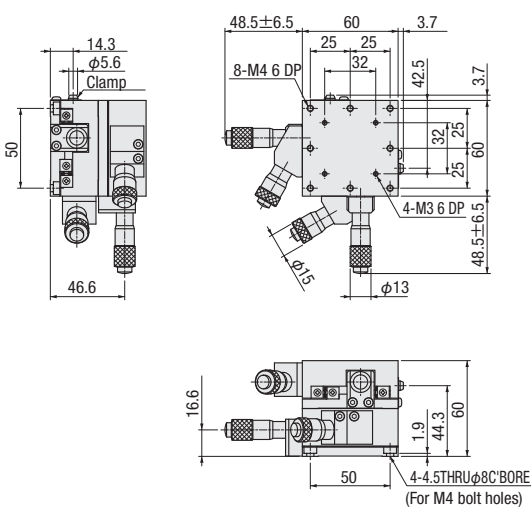
Coarse motion micrometer ±12.5 Stroke

**Dimensional outline drawings**

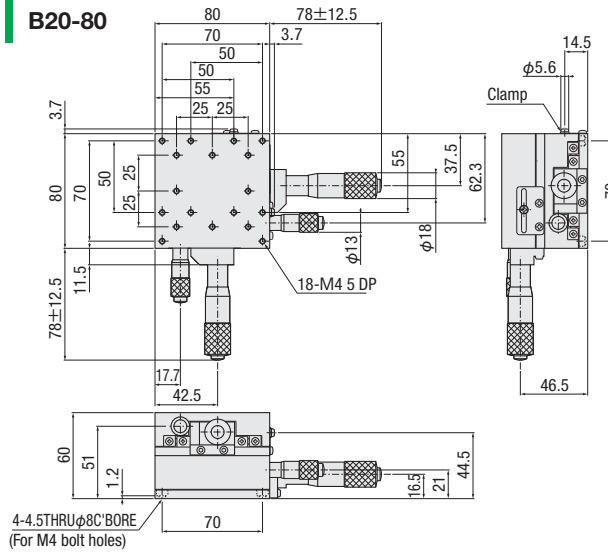


CAD 3D·2D

B20-60LN



B20-80



**Configuration**

Model	B20-	60LN	60RN	80	Reference page
Y	B10-	60LN	60RN	80	P.2-087
X	B10-	60RN	60LN	80	

**1 Model**

B20-□LN

Option code

※ The end of model number N for only □60. Select the option code as below.

**1 Stage table size**

60	60×60mm
80	80×80mm

**2 Operating position**

Specification	L	R	Blank
Code	L	R	Blank

**SPEC**

• Main material: Aluminum • Surface finishing: Black alumite processing

Model	Operating position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (°/N·cm)			Parallelism (Within)	Motion parallelism (Within)	Squareness (Within)	Weight (kg)	Provided screws (Hex socket screws)	
				Straightness	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll						
B20-	60	LN: Standard R/L: Opposite attached micrometer	coarse motion ±6.5 micromotion ±0.3	4.6kgf [45.1N]	2 μm	20"	10"	5.6	6.4	5.6	0.22	0.20	0.22	60 μm	20 μm	10 μm	0.9	4 of M4 - 6
	80	Blank: Standard	coarse motion ±12.5 micromotion ±0.3	5.3kgf [51.9N]				10.4	9.1	10.4	0.18	0.20	0.18					

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

# Manual Stage

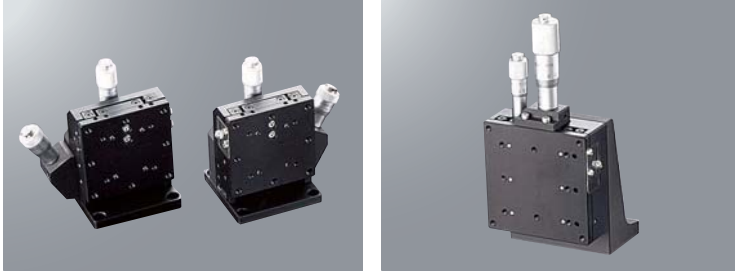
## High Resolution Z-axis Cross Roller Guide Stage □60/□80: B30-60/80

Manual linear stage

B30-60LK

B30-60RK

B30-80



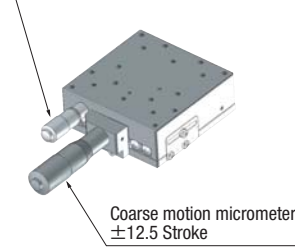
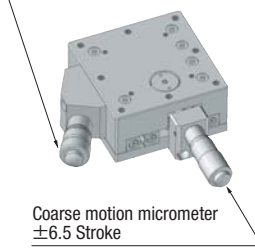
RoHS

### [Features]

- Operable coarse-fine motion with two micrometers.
- Travel distance: B30-60 Coarse motion  $\pm 6.5$ mm, B30-80 Coarse motion  $\pm 12.5$ mm.
- Adjustable within  $\pm 0.3$ mm from the position moved in coarse motion by fine motion micrometer.

Micromotion micrometer  $\pm 0.3$  Stroke

Micromotion micrometer  $\pm 0.3$  Stroke



Coarse motion micrometer  $\pm 6.5$  Stroke

Coarse motion micrometer  $\pm 12.5$  Stroke

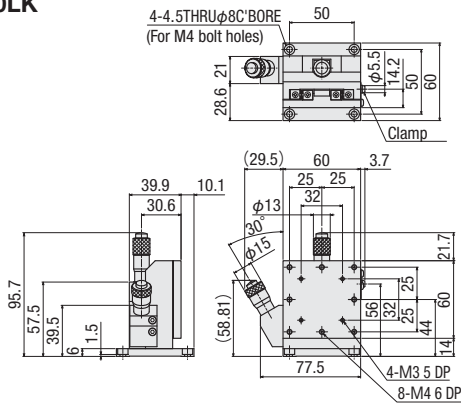
※Illustration shows B10 series

### Dimensional outline drawings

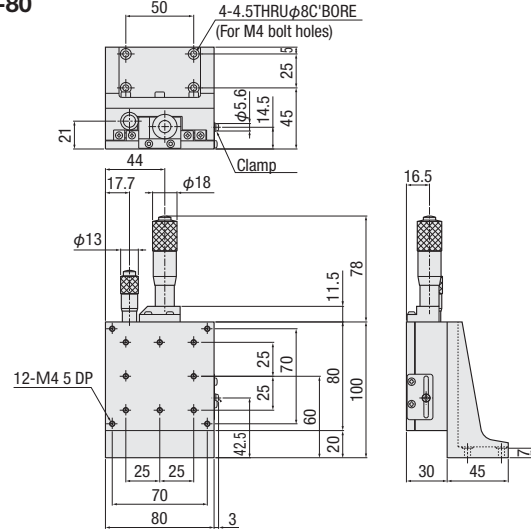
**SURUGA SEIKI**

CAD 3D·2D

B30-60LK



B30-80



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

1 Model **B30-□LK**

Option code

※ The end of model number K for only □60. Select the option code as below.

#### 1 Stage table size

60	60×60mm
80	80×80mm

#### 2 Operating position

Specification	L		R		Blank	
	Image	Image	Image	Image	Image	Image
Code	L	R	Blank			

### SPEC

• Main material: Aluminum • Surface finishing: Black alumite processing

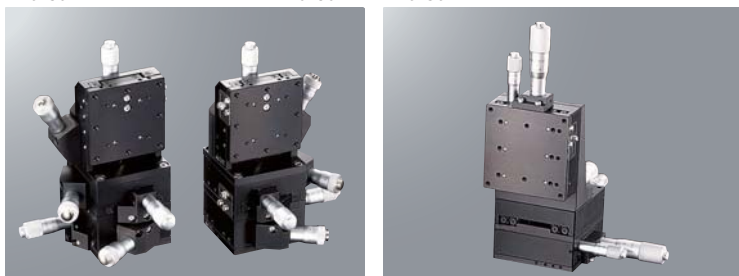
Model	Operating position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N·m)			Moment rigidity (* /N·cm)			Verticality (Within)	Motion vertically (Within)	Weight (kg)	Provided screws (Hex socket screws)	
				Straightness	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll					
B30-	60	LK: Standard RK: Opposite attached micrometer Blank: Standard	coarse motion $\pm 6.5$ mm micromotion $\pm 0.3$ mm	2.0kgf [19.6N]	2 $\mu$ m	20"	10"	8.6	6.4	5.6	0.11	0.10	0.11	70 $\mu$ m	15 $\mu$ m	0.6	4 of M4 - 6
	80	Standard	coarse motion $\pm 12.5$ mm micromotion $\pm 0.3$ mm	3.0kgf [29.4N]			11.5	9.1	10.4	0.14	0.10	0.04	80 $\mu$ m	25 $\mu$ m	0.97		

# High Resolution XYZ-axis Cross Roller Guide Stage □60/□80: B70-60/80

B70-60LK

B70-60RK

B70-80

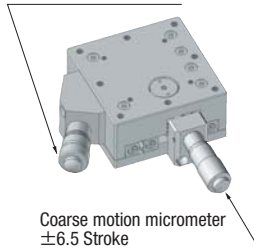


RoHS

### [Features]

- Operable coarse-fine motion with two micrometers.
- Travel distance: B70-60 Coarse motion  $\pm 6.5$ mm, B70-80 Coarse motion  $\pm 12.5$ mm.
- Adjustable within  $\pm 0.3$ mm from the position moved in coarse motion by fine motion micrometer.

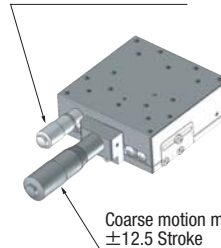
Micromotion micrometer  $\pm 0.3$  Stroke



Coarse motion micrometer  $\pm 6.5$  Stroke

※Illustration shows B10 series

Micromotion micrometer  $\pm 0.3$  Stroke



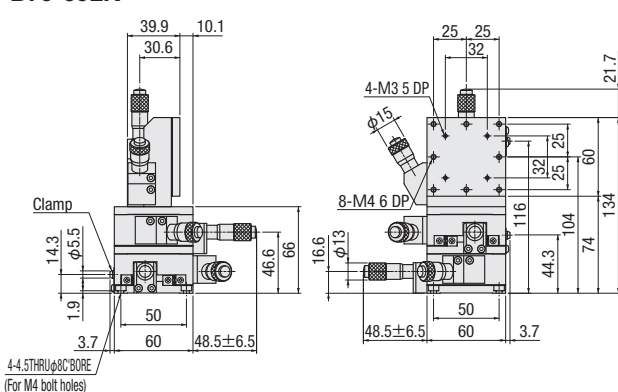
Coarse motion micrometer  $\pm 12.5$  Stroke

### Dimensional outline drawings

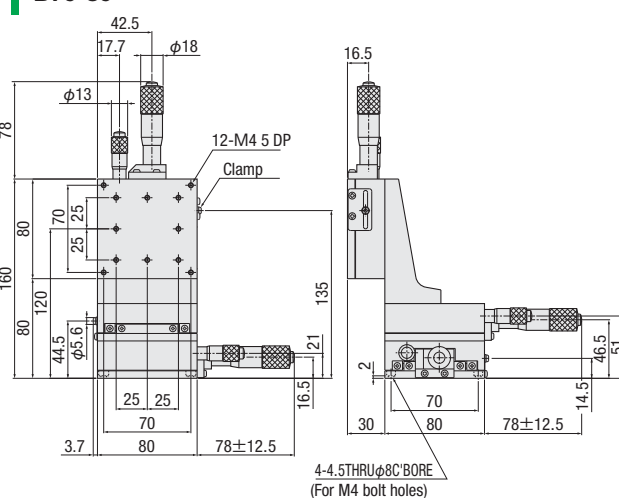
**SURUGA SEIKI**

CAD 3D·2D

B70-60LK



B70-80



### Configuration

Model	B70-	60LK	60RK	80	Reference page
Z	B30-	60LN	60RN	80	● P.2-089
Y	B10-	60LN	60RN	80	● P.2-087
X	B10-	60RN	60LN	80	

1 Model  
**B70-□LK**  
 1 2

※The end of model number K for only □60.  
 Select the option code as below.

### 1 Stage table size

60	60×60mm
80	80×80mm

### 2 Operating position

Specification	Available only B70-60	Available only B70-60	Available only B70-80
Code	L	R	Blank

### SPEC

• Main material: Aluminum • Surface finishing: Black alumite processing

Model	Operating position	Travel distance (mm)	Load capacity	Travel accuracy (Within)			Allowable load for moment (N · m)			Moment rigidity (* /N · cm)			Verticality (Within)	Motion verticality (Within)	Weight (kg)	Provided screws (Hex socket screws)	
				Straightness	Yaw	Roll	Pitch	Yaw	Roll	Pitch	Yaw	Roll					
B70-	60	LK: Standard RK: Opposite attached micrometer	coarse motion $\pm 6.5$ micromotion $\pm 0.3$	2.0kgf [19.6N]	—	—	—	5.6	5.6	5.6	0.32	0.31	0.33	130 $\mu$ m	35 $\mu$ m	1.46	4 of M4 - 6
	80	Blank: Standard	coarse motion $\pm 12.5$ micromotion $\pm 0.3$	3.0kgf [29.4N]	2 $\mu$ m	20"	10"	9.1	9.1	10.4	0.28	0.24	0.32	140 $\mu$ m	45 $\mu$ m	2.34	

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

2

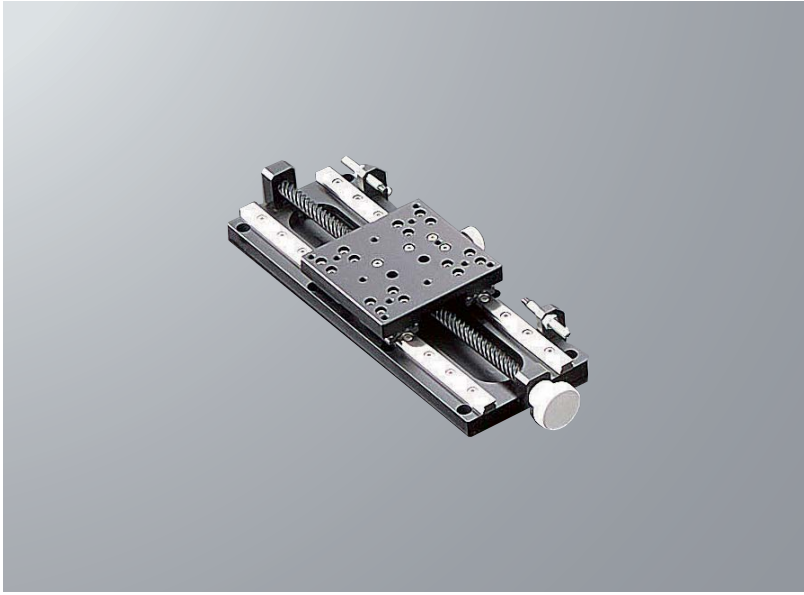
090

## X-axis Long Stroke Slide Guide Stage □80: B15-150

Manual linear stage

RoHS

B15-150



- Long stroke stage.
- Optimal control system for heavy weight, big size and optical system.
- Adjustable travel distance by changing a stopper position on the side.

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

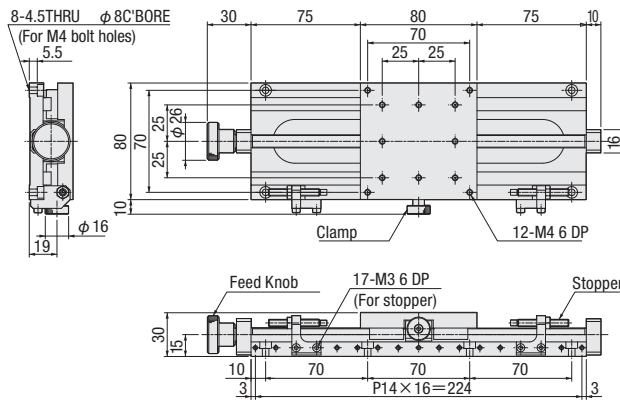
Other

### SPEC

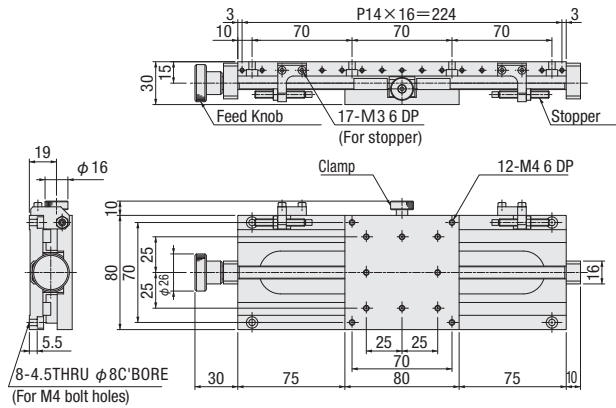
		SPEC
<b>Model</b>		<b>B15-150</b>
<b>(Opposite hand)</b>		<b>B15-150R</b>
Stage table size		80×80mm
Travel distance		128mm
Travel distance per rotation of knob		24mm
Guide		Slide guide
Load capacity		15kgf [147N]
Travel accuracy	Straightness	—
	Pitch	10.6N · m
Allowable load for moment	Yaw	7.5N · m
	Roll	11.5N · m
	Parallelism	50μm
Motion parallelism		25μm
Weight		0.9kg
Main material—Surface finishing		Aluminum—Black alumite processing
Provided screws (Hex socket screws)		8 of M4—10

**Dimensional outline drawings**

**B15-150**



**B15-150R**



Side guide stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

092

## Z-axis Mount: B34 (140×200)

Z axis mount

B34



B34-N



RoHS

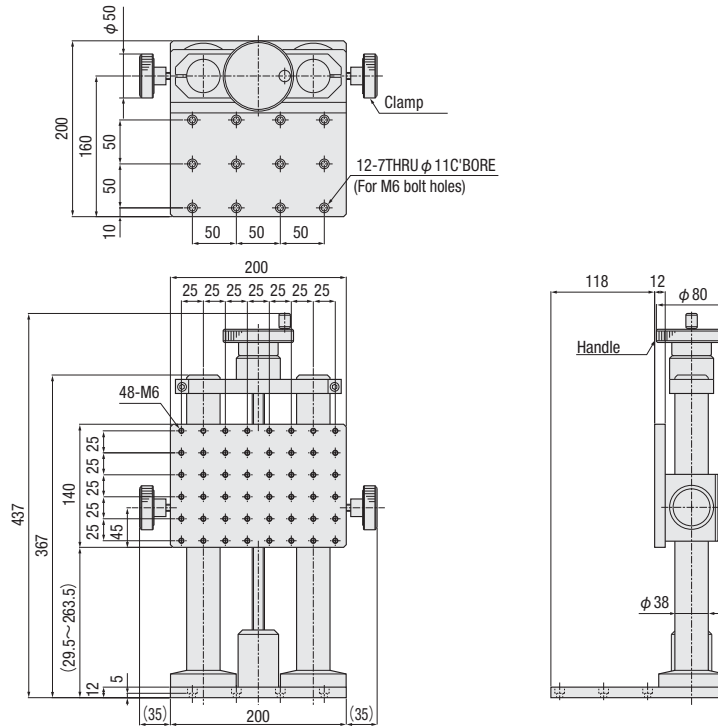
**SURUGA SEIKI**

CAD 3D·2D

- Optimal control system for heavy weight.
- 3mm per handle rotation.
- B34 has anti-vibration mechanism with special rod.

### Dimensional outline drawings

B34



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

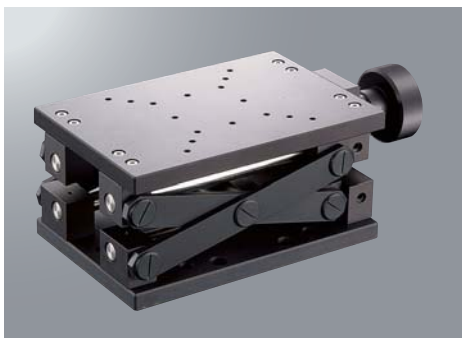
Other

### SPEC

Model	B34	B34-N
Stage table size	140×200mm	
Travel distance	234mm	
Travel distance per rotation of knob	3mm	
Guide	Shaft	
Load capacity	15.0kgf [147N]	
Weight	10.3kg	11.3kg
Anti-vibration function	With anti-vibration function	Without anti-vibration function
Main material—Surface finishing	Aluminum—Black alumite processing	
Provided screws (Hex socket screws)	6 of M6—12	

# Laboratory Jack: B35 (120×180/80×120)

B35



B35-N



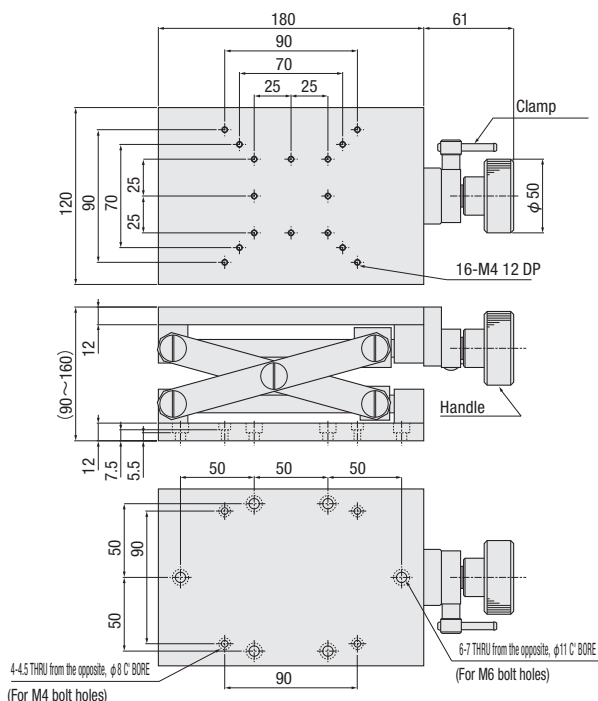
**SURUGA SEIKI**

CAD  
3D·2D

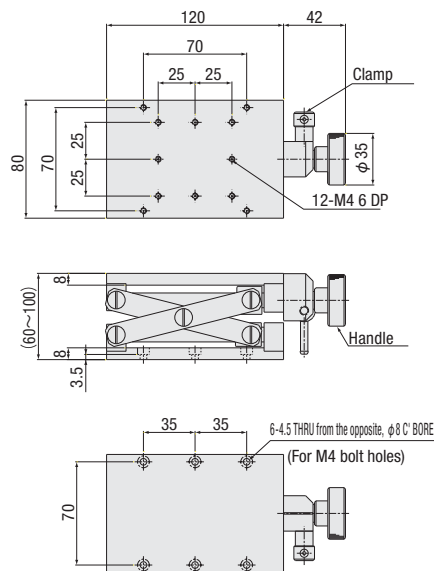
- Optimal control system for heavy weight.
- 3mm per handle rotation
- Can be fixed strongly by a clamp.

## Dimensional outline drawings

B35



B35-N



SPEC		
Model	B35	B35-N
Stage table size	120×180mm	80×120mm
Travel distance	70mm	40mm
Travel distance per rotation of knob	3mm	2mm
Load capacity	10.0kgf [98N]	7.0kgf [68.6N]
Parallelism	200μm	200μm
Weight	3.5kg	1.25kg
Main material—Surface finishing	Aluminum—Black alumite processing	
Provided screws (Hex socket screws)	4 of M4—12, 4 of M6—12	4 of M4—10

- Lab Jack
- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories
- Linear Ball
- Cross Roller
- Dovetail
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other
- 2
- 094



## Manual Goniometer Stage Guidance



There are circular arc drive stages with a center of rotation on the center perpendicular of the table surface. These stages are ideal for angle adjustment and postural alignment. We provide a wide range of advanced stages for jigs, production equipment and devices.

### Application

- Devices for assembling, adjusting optical pickups and camera angles.
- Sensor tilt adjustment etc.

## Features



### Dovetail goniometer stage B54/B55 ▶ P.2-137~

A dovetail goniometer stage which is applied a dovetail method for travel guide and worm gear for feeding mechanism.

Can be used for R&D, installation in devices and jigs.

Stage size	25×25mm	30×30mm	40×40mm	50×50mm	60×60mm	80×80mm
------------	---------	---------	---------	---------	---------	---------



### Crossed roller goniometer stage Worm type B56/B57 ▶ P.2-149~

A high accuracy goniometer stage which is applied a crossed roller guide for travel guide and worm gear for feeding mechanism.

Good operation feeling. It is ideal for repeating drive frequency.

Stage size	50×50mm	60×60mm	70×70mm
------------	---------	---------	---------



### Crossed roller goniometer stage Micro meter

A high resolution and high accuracy goniometer stage which is applied a crossed roller guide for travel guide and micrometer for feeding mechanism.

#### Center pushing type B58-A ▶ P.2-155~

Can save space around the stage.

Stage size	50×50mm	60×60mm	70×70mm
------------	---------	---------	---------



#### Side pushing type B58-C ▶ P.2-159~

Ideal for use in applications where space is limited.

Stage size	40×40mm	50×50mm	60×60mm	70×70mm
------------	---------	---------	---------	---------

## Center of rotation precision • Center of rotation height

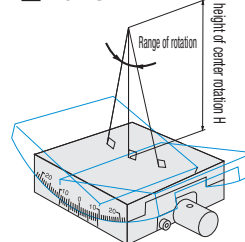
### ▽Center of rotation precision

Put a perfect circle ball to the center of rotation (on the actual center of rotation) height, and we recognized center of rotation tilt accuracy that amount of a perfect circle ball tilt (X.Y.Z) that occurs at the full-stroke.

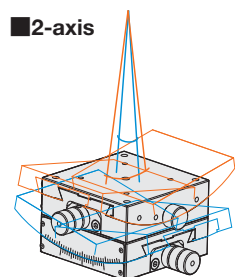
### ▽Heights of the center of rotation (Work-distance)

The center of rotation height becomes the height from the stage top surface to the perfect circle ball center.

#### ■1-axis



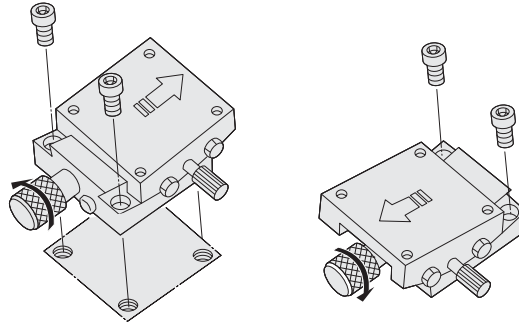
#### ■2-axis



## For use correctly

### ▽How to mount

By rotating feeding screw in clockwise, you can find two bolt holes. You will find two more bolt holes by rotating it in counter clockwise. Use these holes to fix a stage with accessory screws.



### ▽About object on the upper or lower stage.

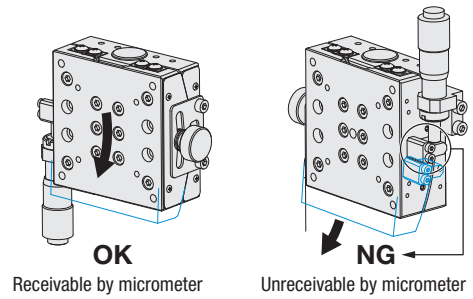
Stage surface might be deformed and mounting unflat object and set to the unflat place can affect to be deformed stage surface and decreasing accuracy.

[Flatness guideline: within 10 $\mu$ m]

### ▽Position of stage mounting

All products SPEC shows must be shown flat setting condition. Pay attention to mount such as up side down, vertical on the side and horizontal on the side. Load capacity and accuracy might be changed by the positioning.

Please feel free to ask us for more information.



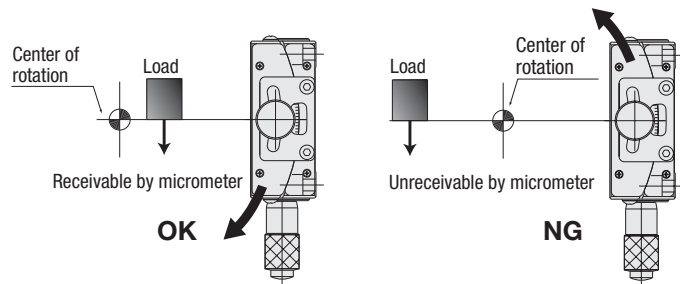
### ▼Posture characteristic list for each products

Travel guide [Feeding Type]	Inverted and reversed	Side horizontal	vertically use on the side
Dovetail [Worm gear]	○	○	○
Cross roller [Worm gear]	○	○	○
Cross roller [Micrometer]	○	○	△

○: Available under limit of load or moment

△: Accuracy might be decreased under limit of load or moment

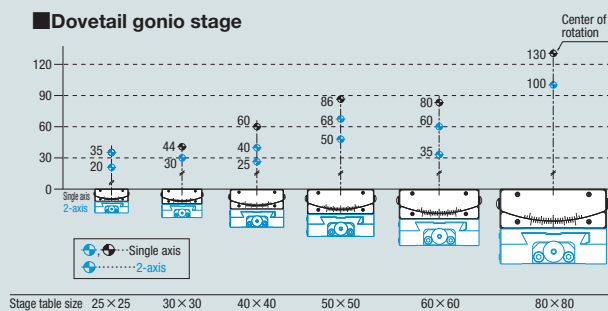
In case of vertically use on the side, it might be not able to use due to load position.



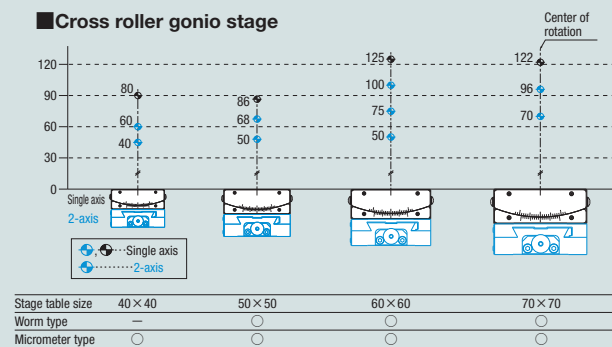
## Center of rotation height list

- It shows the center of rotation height for each stage size.
- Blue shows it is possible to configurate 2-axis type.

### ■Dovetail gonio stage



### ■Cross roller gonio stage



Stage table size	40 × 40	50 × 50	60 × 60	70 × 70
Worm type	○	○	○	○
Micrometer type	○	○	○	○

## Dovetail Goniometer Stage □25: B54/B55-25 Series

RoHS

### 1-axis

B54-25 series B54-25LN



B54-25R series B54-25LNR



### 2-axis

B55-25N



B55-25NR



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

### Other 25×25mm stage

• Linear-motion stage



X-axis SS stage  
BSS16-25 series  
P.2-017~

• Rotation stage



B43-25 series  
P.2-171~

• Horizontal Z-axis stage



B33-25A  
P.2-082~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

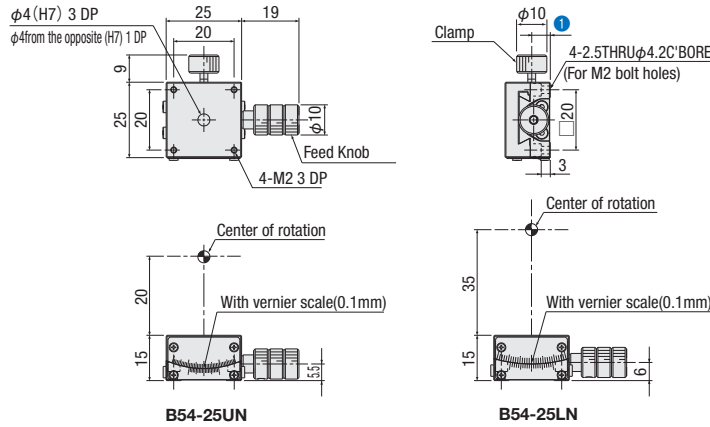
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

SPEC			
Axis	1-axis		2-axis
Model	B54-25UN	B54-25LN	B55-25N
(Opposite hand)	B54-25UNR	B54-25LNR	B55-25NR
Stage table size	25×25mm		
Heights of the center of rotation	20mm	35mm	20mm
Travel distance	±15°	±10°	(Up) ±15° (Down) ±10°
Vernier minimum reading	Vernier scale 0.1°		
Travel per Knob	≒2.0°		
Guide	Dovetail		
Load capacity	2.0kgf [19.6N]		
Allowable load for moment	Pitch	0.3N · m	
	Yaw	0.3N · m	
	Roll	0.3N · m	
Weight	0.07kg		0.14kg
Main material—Surface finishing	Brass—Black paint		
Provided screws (Hex socket screws)	4 of M2—6		

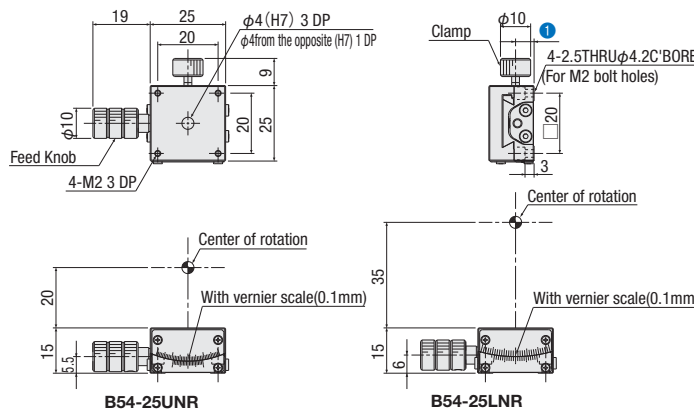
Dimensional outline drawings(1-axis)

**B54-25 series**



Model	WD (mm)	① (mm)
B54-25UN	20	6.2
B54-25LN	35	7.7

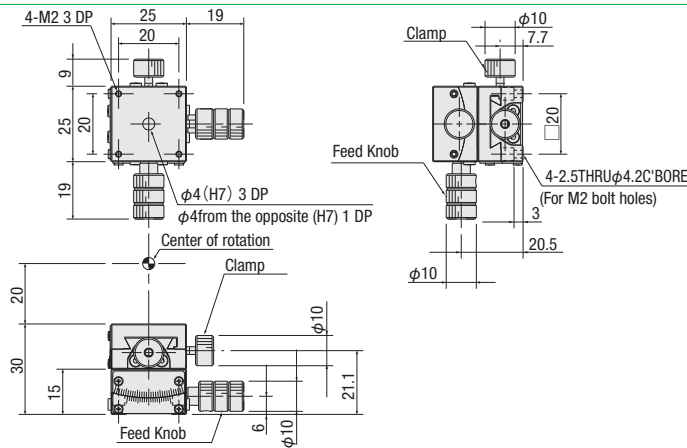
**B54-25R series**



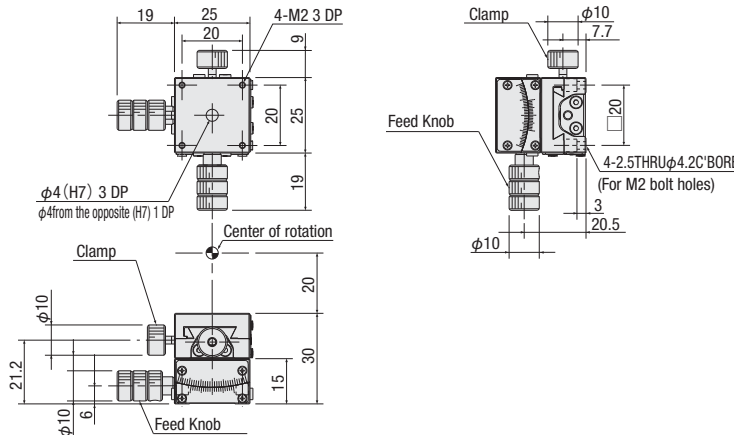
Model	WD (mm)	① (mm)
B54-25UNR	20	6.2
B54-25LNR	35	7.7

Dimensional outline drawings(2-axis)

**B55-25N**



**B55-25NR**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

2

138

## Dovetail Goniometer Stage □30: B54/B55-30 Series

### 1-axis

B54-30 series B54-30L



B54-30R series B54-30LR



### 2-axis

B55-30U



B55-30UR



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

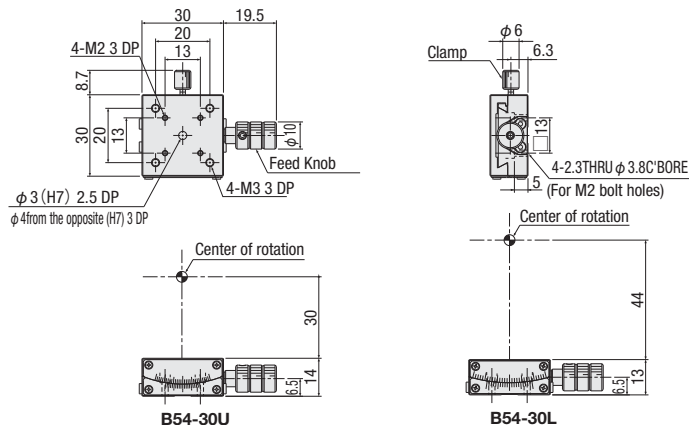
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

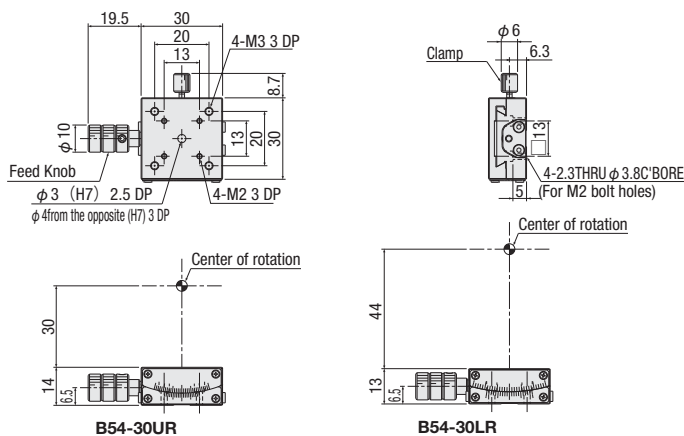
SPEC			
Axis	1-axis		2-axis
Model	B54-30U	B54-30L	B55-30U
(Opposite hand)	B54-30UR	B54-30LR	B55-30UR
Stage table size	30×30mm		
Heights of the center of rotation	30mm	44mm	30mm
Travel distance	±10°		
Vernier minimum reading	Vernier scale 0.1°		
Travel per Knob	≒2.06°	≒1.5°	(Up) ≒2.06° (Down) ≒1.5°
Guide	Dovetail		
Load capacity	1.0kgf [9.8N]		
Allowable load for moment	Pitch	0.5N · m	
	Yaw	0.5N · m	
	Roll	0.5N · m	
Weight	0.10kg		0.20kg
Main material—Surface finishing	Brass—Black coating finish		
Provided screws (Hex socket screws)	4 of M2—8		

Dimensional outline drawings(1-axis)

**B54-30 series**

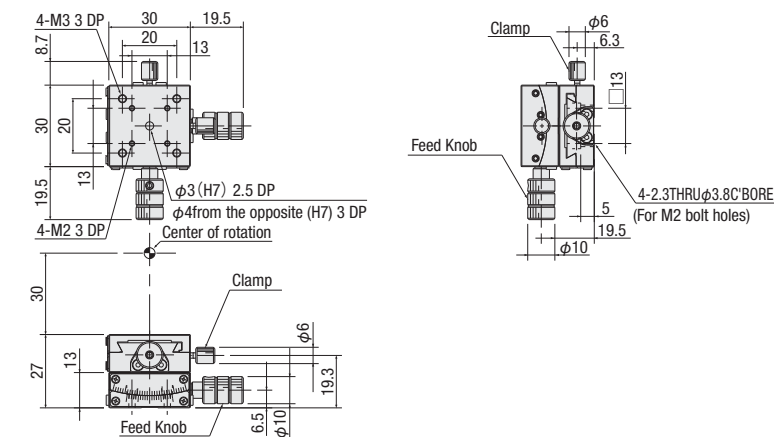


**B54-30R series**

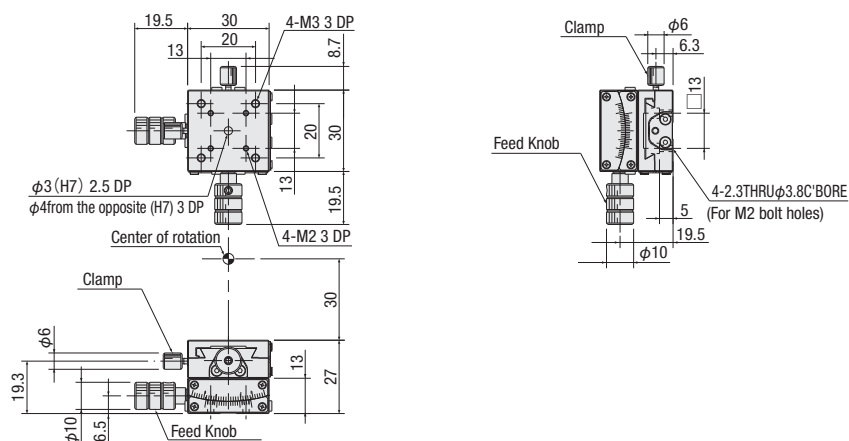


Dimensional outline drawings(2-axis)

**B55-30U**



**B55-30UR**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

2

140

## Dovetail Goniometer Stage □40: B54/B55-40 Series

RoHS

### 1-axis

B54-40 series B54-40LN



B54-40R series B54-40LNR



### 2-axis

B55-40 series B55-40N



B55-40R series B55-40NR



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

### Other 40×40mm stage

• Goniometer stage



Micrometer Side pushing type B58-40 series  
▶ P.2-159~

• Linear-motion stage



X-axis SS stage BSS16-40 series  
▶ P.2-019~

• Z-axis stage



B33-40KGA  
▶ P.2-082~

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□25

□30

□40

□50

□60

□70

□80

□100

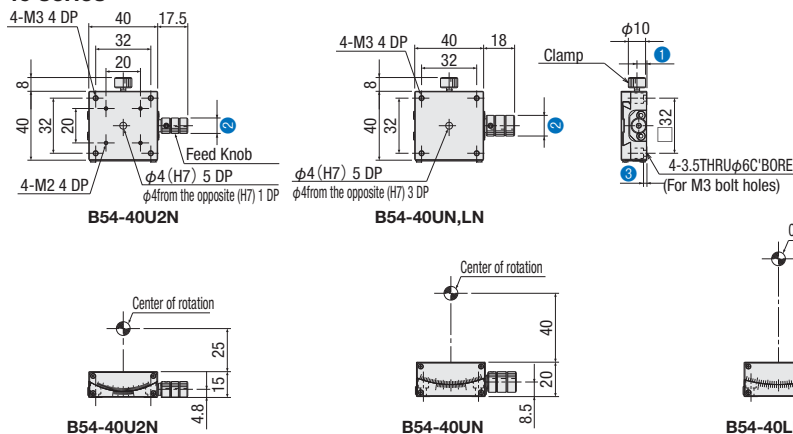
□120

Other

SPEC					
Axis	1-axis			2-axis	
Model	B54-40U2N	B54-40UN	B54-40LN	B55-40-2N	B55-40N
(Opposite hand)	B54-40U2NR	B54-40UNNR	B54-40LNR	B55-40-2NR	B55-40NR
Stage table size	40×40mm				
Heights of the center of rotation	25mm	40mm	60mm	25mm	40mm
Travel distance	±20°	±15°	±10°	(Up) ±20° (Down) ±15°	(Up) ±15° (Down) ±10°
Vernier minimum reading	Vernier scale 0.1°				
Travel per Knob	≐2.2°	≐1.89°	≐1.33°	(Up) ≐2.2° (Down) ≐1.89°	(Up) ≐1.89° (Down) ≐1.33°
Guide	Dovetail				
Load capacity	3.0kgf [29.4N]			2.8kgf [27.4N]	2.7kgf [26.4N]
Allowable load for moment	Pitch	0.8N · m			0.8N · m
	Yaw	1.0N · m			1.0N · m
	Roll	1.0N · m			0.8N · m
Weight	0.18kg	0.24kg		0.42kg	0.48kg
Main material—Surface finishing	Brass—Black coating finish				
Provided screws (Hex socket screws)	4 of M3—6		4 of M3—8		

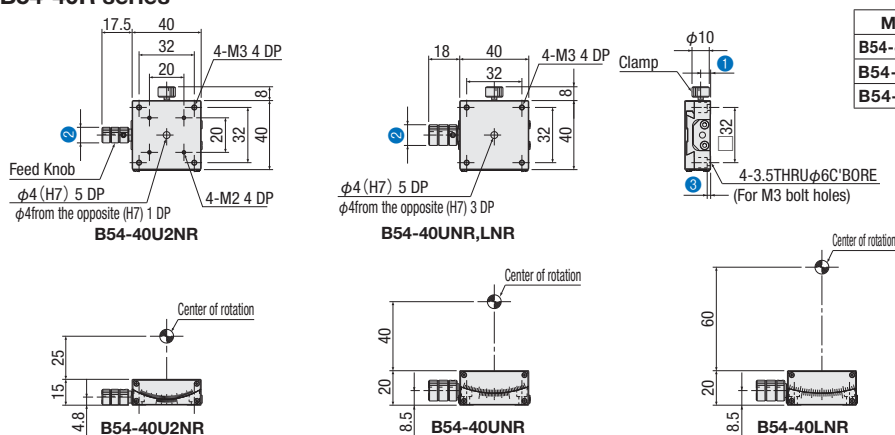
Dimensional outline drawings (1-axis)

**B54-40 series**



Model	WD (mm)	① (mm)	② ( $\phi$ )	③ (mm)
B54-40U2N	25	5.8	9	2
B54-40UN	40	9.7	12	5
B54-40LN	60	9.7	12	5

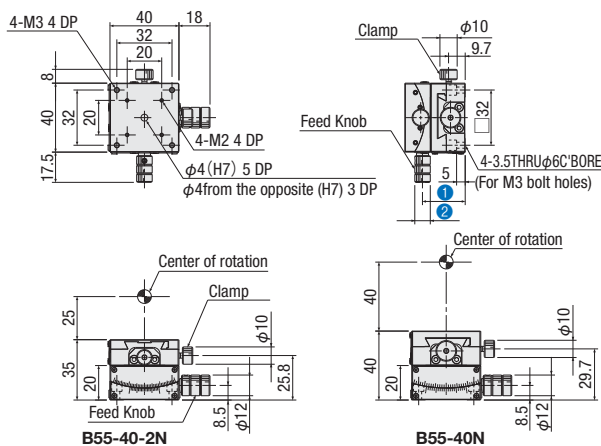
**B54-40R series**



Model	WD (mm)	① (mm)	② ( $\phi$ )	③ (mm)
B54-40U2NR	25	5.8	9	2
B54-40UNR	40	9.7	12	5
B54-40LNR	60	9.7	12	5

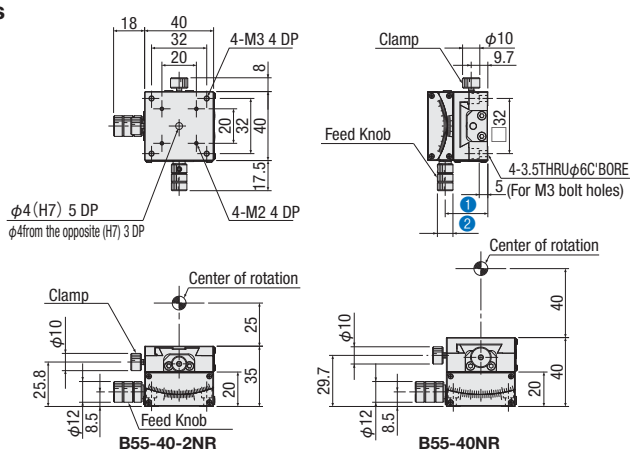
Dimensional outline drawings (2-axis)

**B55-40 series**



Model	WD (mm)	① (mm)	② ( $\phi$ )
B55-40-2N	25	24.8	9
B55-40N	40	28.5	12

**B55-40R series**



Model	WD (mm)	① (mm)	② ( $\phi$ )
B55-40-2NR	25	24.8	9
B55-40NR	40	28.5	12

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

2

142



## Dovetail Goniometer Stage□50: B54/B55-50 Series

### 1-axis

B54-50 series B54-50L



B54-50R series B54-50LR



### 2-axis

B55-50 series B55-50U



B55-50R series B55-50UR



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

### Other 50×50mm stage

• Cross roller goniometer stage



Worm type  
B56-50 series  
▶P.2-149~



Micrometer  
Center pushing type  
B58-50A series  
▶P.2-155~



Micrometer  
Side pushing type  
B58-50C series  
▶P.2-161~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

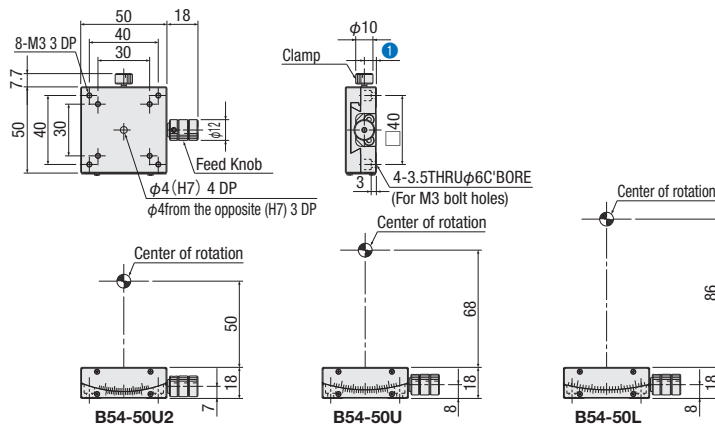
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

SPEC					
Axis	1-axis			2-axis	
Model	B54-50U2	B54-50U	B54-50L	B55-50U2	B55-50U
(Opposite hand)	B54-50U2R	B54-50UR	B54-50LR	B55-50U2R	B55-50UR
Stage table size	50×50mm				
Heights of the center of rotation	50mm	68mm	86mm	50mm	68mm
Travel distance	±10°		±8°	±10°	(Up) ±10° (Down) ±8°
Vernier minimum reading	Vernier scale 0.1°				
Travel per Knob	≒1.55°	≒1.2°	≒0.97°	(Up) ≒1.55° (Down) ≒1.2°	(Up) ≒1.2° (Down) ≒0.97°
Guide	Dovetail				
Load capacity	3.0kgf [29.4N]			2.5kgf [24.5N]	
Allowable load for moment	Pitch	1.0N · m			1.0N · m
	Yaw	1.2N · m			1.2N · m
	Roll	1.2N · m			1.0N · m
Weight	0.36kg			0.72kg	
Main material—Surface finishing	Brass—Black coating finish				
Provided screws (Hex socket screws)	4 of M3—6				

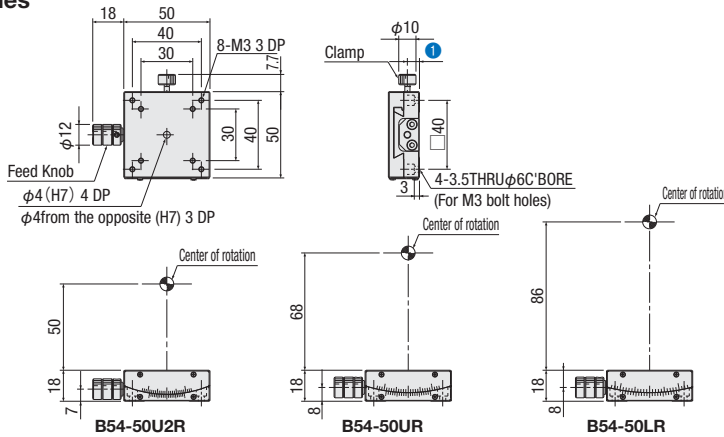
Dimensional outline drawings (1-axis)

**B54-50 series**



Model	WD (mm)	① (mm)
B54-50U2	50	7
B54-50U	68	8
B54-50L	86	8

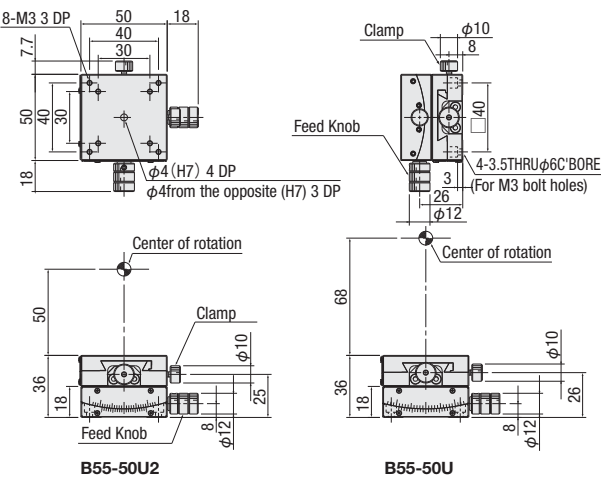
**B54-50R series**



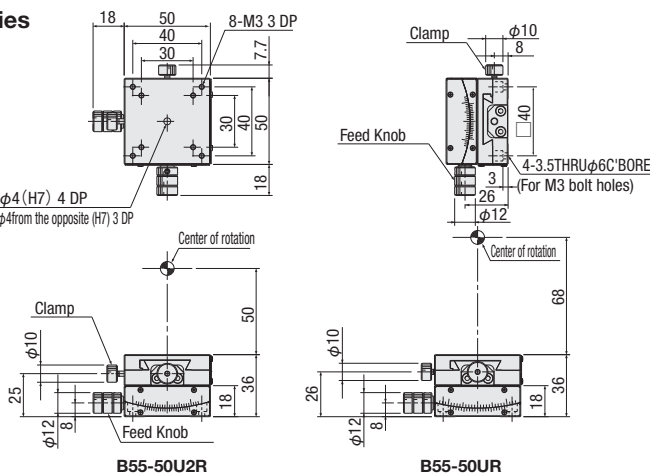
Model	WD (mm)	① (mm)
B54-50U2R	50	7
B54-50LR	68	8
B54-50UR	86	8

Dimensional outline drawings (2-axis)

**B55-50 series**



**B55-50R series**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

2

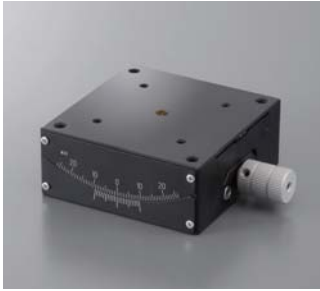
144

## Dovetail Goniometer Stage □60: B54/B55-60 Series

RoHS

### 1-axis

B54-60 series B54-60U2N



B54-60R series B54-60U2NR



### 2-axis

B55-60 series B55-60N



B55-60R series B55-60NR



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

### Other 60mm x 60mm stage

• Cross roller goniometer stage



Worm type  
B56-60 series  
▶ P.2-151~



Micrometer  
Side pushing type  
B58-60C series  
▶ P.2-163~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

SPEC					
Axis	1-axis			2-axis	
Model	B54-60U2N	B54-60UN	B54-60LN	B55-60-2N	B55-60N
(Opposite hand)	B54-60U2NR	B54-60UNNR	B54-60LNR	B55-60-2NR	B55-60NR
Stage table size	60×60mm				
Heights of the center of rotation	35mm	60mm	80mm	35mm	60mm
Travel distance	±25°	±20°	±15°	(Up) ±25° (Down) ±20°	(Up) ±20° (Down) ±15°
Vernier minimum reading	Vernier scale 0.1°				
Travel per Knob	≒2.0°	≒1.3°	≒1.0°	(Up) ≒2.0° (Down) ≒1.3°	(Up) ≒1.3° (Down) ≒1.0°
Guide	Dovetail				
Load capacity	6.0kgf [58.8N]			5.3kgf [51.9N]	5.4kgf [52.9N]
Allowable load for moment	Pitch	1.5N · m			1.5N · m
	Yaw	2.0N · m			2.0N · m
	Roll	2.0N · m			1.5N · m
Weight	0.72kg	0.58kg		1.30kg	1.16kg
Main material—Surface finishing	Brass—Black coating finish				
Provided screws (Hex socket screws)	4 of M4—8				



## Dovetail Goniometer Stage□80: B54/B55-80 Series

RoHS

### 1-axis

B54-80 series B54-80L



B54-80R series B54-80LR



### 2-axis

B55-80



B55-80R



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Ideal for use in R&D, integrating device and much more.

### Other 80×80mm stage

• Linear-motion stage



X-axis SS stage  
BSS16-80 series  
P.2-027~



Thin type XY-axis stage  
BSS23-80 series  
P.2-041~

• Horizontal Z-axis stage



B33-80 series  
P.2-083~

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□25

□30

□40

□50

□60

□70

□80

□100

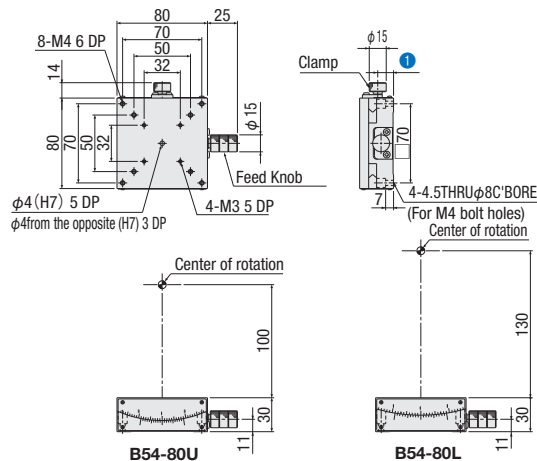
□120

Other

		SPEC		
Axis		1-axis		2-axis
Model		B54-80U	B54-80L	B55-80
(Opposite hand)		B54-80UR	B54-80LR	B55-80R
Stage table size		80×80mm		
Heights of the center of rotation		100mm	130mm	100mm
Travel distance		±18°	±15°	(Up) ±18° (Down) ±15°
Vernier minimum reading		Vernier scale 0.1°		
Travel per Knob		≒1.0°		
Guide		Dovetail		
Load capacity		5.0kgf [49.0N]		4.3kgf [42.1N]
Allowable load for moment	Pitch	2.0N · m		2.0N · m
	Yaw	3.0N · m		3.0N · m
	Roll	3.0N · m		2.0N · m
Weight		0.64kg		1.28kg
Main material—Surface finishing		Aluminum—Black alumite processing		
Provided screws (Hex socket screws)		4 of M4—12		

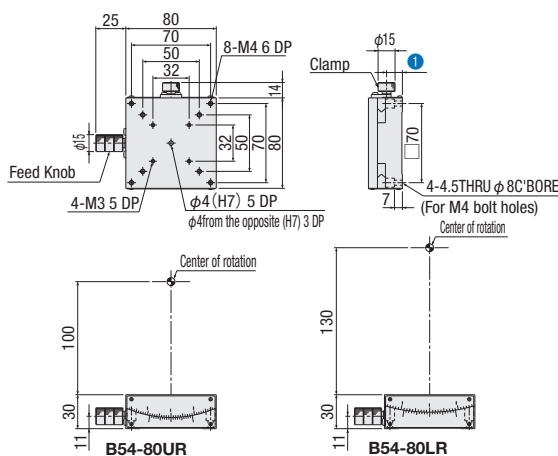
Dimensional outline drawings (1-axis)

**B54-80 series**



Model	WD (mm)	① (mm)
B54-80U	100	14
B54-80L	130	13

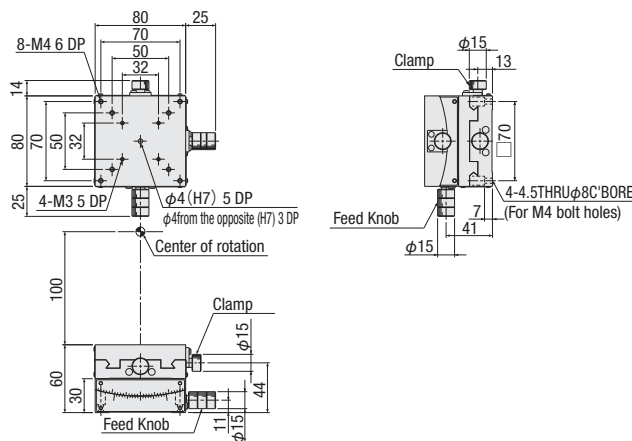
**B54-80R series**



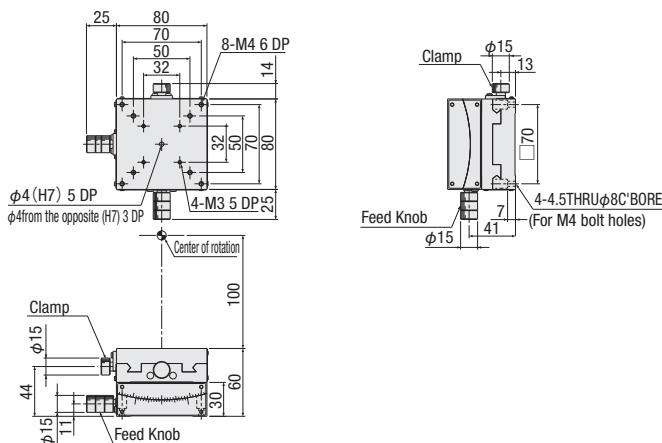
Model	WD (mm)	① (mm)
B54-80UR	100	14
B54-80LR	130	13

Dimensional outline drawings (2-axis)

**B55-80**



**B55-80R**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

## Cross Roller Goniometer Stage (Worm type) □50: B56/B57-50 Series

### 1-axis

B56-50 series B56-50W



B56-50R series B56-50WR



### 2-axis

B57-50 series B57-50U



■ High cost performance goniometer stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in repeatability motion with good operation.

### Other 50 x 50mm stage

• Cross roller goniometer stage

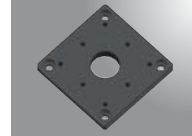


Micrometer  
Center pushing type  
B58-50A series  
▶ P.2-155~



Micrometer  
Side pushing type  
B58-50C series  
▶ P.2-161~

### Adaptor plate



Conversion plate for mounting  
difference size stage  
A49 series  
▶ P.2-183~

X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross  
Roller

□25

□30

□40

□50

□60

□70

□80

□100

□120

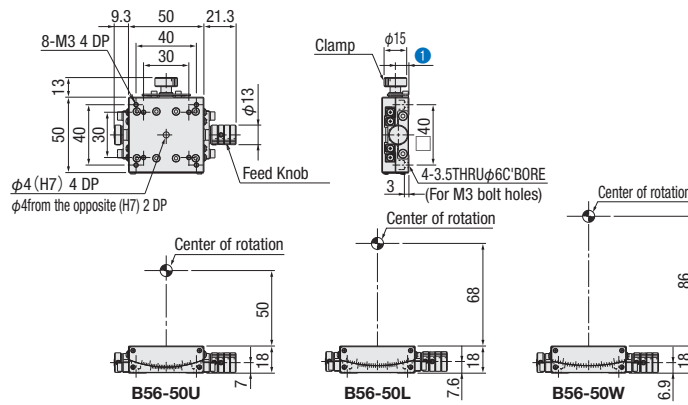
Other

### SPEC

Axis	1-axis			2-axis	
Model	B56-50U	B56-50L	B56-50W	B57-50U	B57-50L
(Opposite hand)	B56-50UR	B56-50LR	B56-50WR	B57-50UR	B57-50LR
Stage table size	50×50mm				
Heights of the center of rotation	50±0.2mm	68±0.2mm	86±0.2mm	50±0.4mm	68±0.4mm
Center of rotation precision	Under 0.01mm				
Travel distance	±10.0°	±8.0°	±6.0°	(Up) ±10° (Down) ±8°	(Up) ±8° (Down) ±6°
Vernier minimum reading	Vernier scale 0.1°				
Travel per Knob	≐1.56°	≐1.20°	≐0.96°	(Up) ≐1.56° (Down) ≐1.20°	(Up) ≐1.20° (Down) ≐0.96°
Guide	Cross roller guide				
Load capacity	3.0kgf [29.4N]			2.7kgf [26.5N]	
Allowable load for moment	Pitch	1.5N · m			1.5N · m
	Yaw	1.2N · m			1.2N · m
	Roll	2.5N · m			1.5N · m
Moment rigidity	Pitch	0.42°/N · cm			0.65°/N · cm
	Yaw	0.16°/N · cm			0.32°/N · cm
	Roll	0.23°/N · cm			0.65°/N · cm
Weight	0.31kg			0.62kg	
Main material—Surface finishing	Brass—Nickel and Chromium plated				
Provided screws (Hex socket screws)	4 of M3—6				

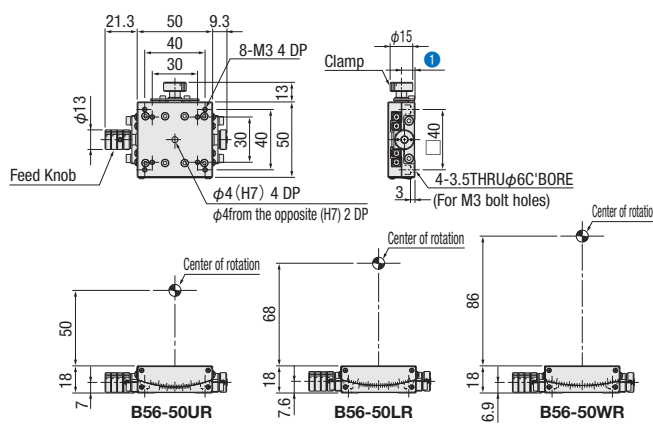
Dimensional outline drawings(1-axis)

**B56-50 series**



Model	WD (mm)	① (mm)
B56-50U	50	9
B56-50L	68	9.9
B56-50W	86	9.9

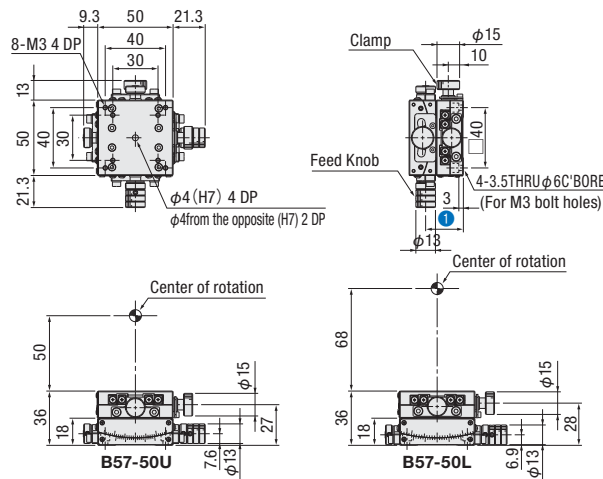
**B56-50R series**



Model	WD (mm)	① (mm)
B56-50UR	50	9
B56-50LR	68	9.9
B56-50WR	86	9.9

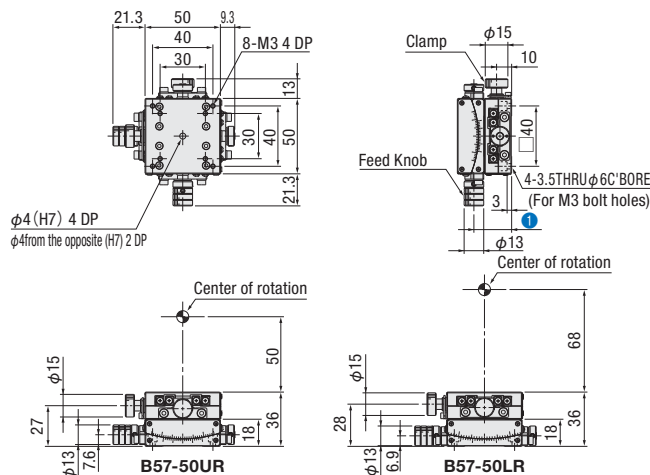
Dimensional outline drawings(2-axis)

**B57-50 series**



Model	WD (mm)	① (mm)
B57-50U	50	25
B57-50L	68	25.8

**B57-50R series**



Model	WD (mm)	① (mm)
B57-50UR	50	25
B57-50LR	68	25.8

Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other

2

150



## Cross Roller Goniometer Stage (Worm type) □60: B56/B57-60 Series

### 1-axis

B56-60 series (B56-60U)



B56-60R series (B56-60USR)



### 2-axis

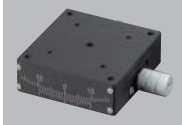
B57-60 series (B57-60)



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in repeatability motion with good operation.

### Other 60×60mm Stage

• Dovetail goniometer stage



B54-60 series  
▶ P.2-145~

• Cross roller goniometer stage



Micrometer  
Side pushing type  
B58-60C series  
▶ P.2-163~

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□25

□30

□40

□50

□60

□70

□80

□100

□120

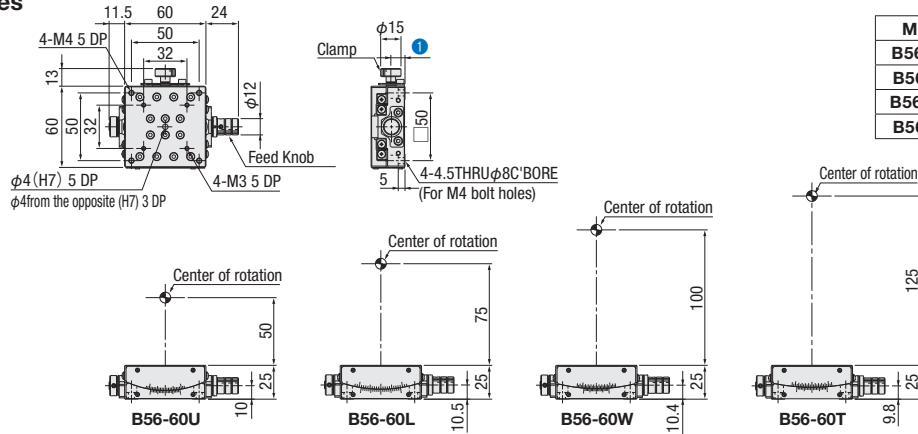
Other

### SPEC

Axis	1-axis				2-axis		
	B56-60U	B56-60L	B56-60W	B56-60T	B57-60	B57-60L	B57-60W
Model	B56-60U	B56-60L	B56-60W	B56-60T	B57-60	B57-60L	B57-60W
(Opposite hand)	B56-60USR	B56-60LSR	B56-60WR	B56-60TR	B57-60SR	B57-60LR	B57-60WR
Stage table size	60×60mm						
Heights of the center of rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm	50±0.4mm	75±0.4mm	100±0.4mm
Center of rotation precision	Under 0.01mm						
Travel distance	±10.0°	±8.0°	±5.0°	±4.0°	(Up) ±10° (Down) ±8°	(Up) ±8° (Down) ±5°	(Up) ±5° (Down) ±4°
Vernier minimum reading	Vernier scale 0.10°		Vernier scale 0.05°		(Up) 0.10° (Down) 0.10°	—	(Up) 0.05° (Down) 0.05°
Travel per Knob	≒2.25°	≒1.60°	≒1.25°	≒1.00°	(Up) ≒2.25° (Down) ≒1.60°	(Up) ≒1.60° (Down) ≒1.25°	(Up) ≒1.25° (Down) ≒1.00°
Guide	Cross roller guide						
Load capacity	5.0kgf [49.0N]				4.7kgf [46.0N]		
Allowable load for moment	Pitch	1.5N · m				1.5N · m	
	Yaw	2.0N · m				2.0N · m	
	Roll	2.6N · m				1.5N · m	
Moment rigidity	Pitch	0.27°/N · cm				0.37°/N · cm	
	Yaw	0.09°/N · cm				0.18°/N · cm	
	Roll	0.10°/N · cm				0.37°/N · cm	
Weight	0.33kg				0.66kg		
Main material—Surface finishing	Aluminum—Black alumite processing						
Provided screws (Hex socket screws)	4 of M4—10						

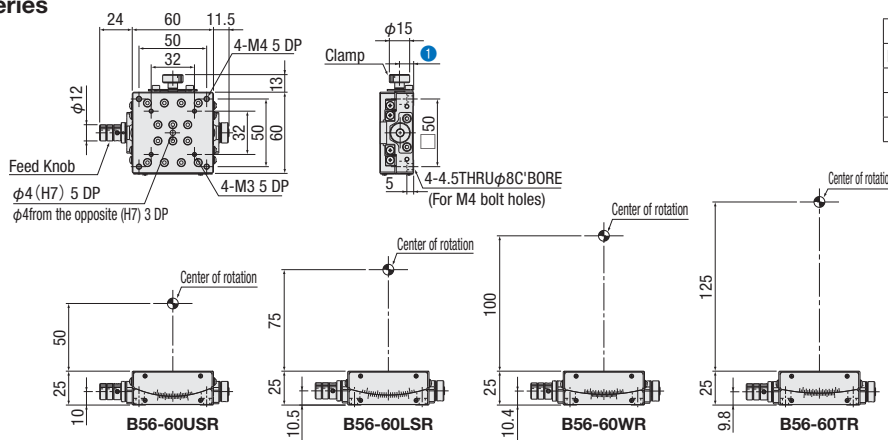
Dimensional outline drawings (1-axis)

**B56-60 series**



Model	WD (mm)	① (mm)
B56-60U	50	10.5
B56-60L	75	11.2
B56-60W	100	16.4
B56-60T	125	16.3

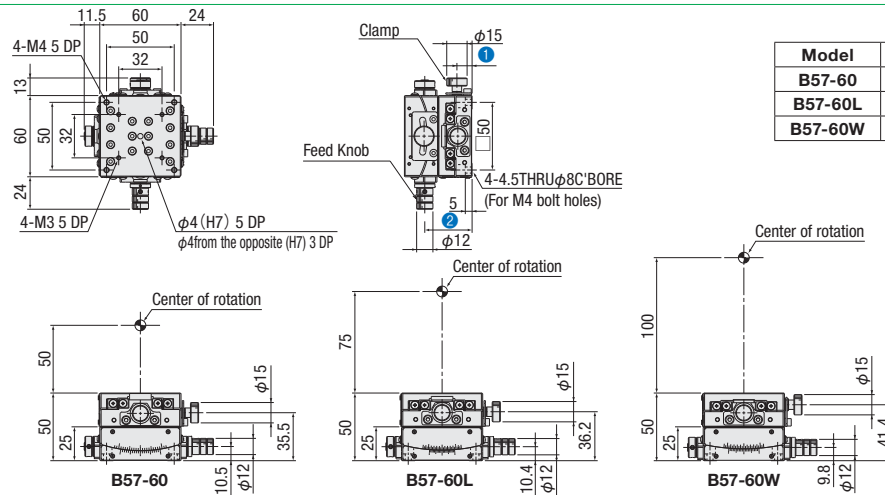
**B56-60R series**



Model	WD (mm)	① (mm)
B56-60USR	50	10.5
B56-60LSR	75	11.2
B56-60WR	100	16.4
B56-60TR	125	16.3

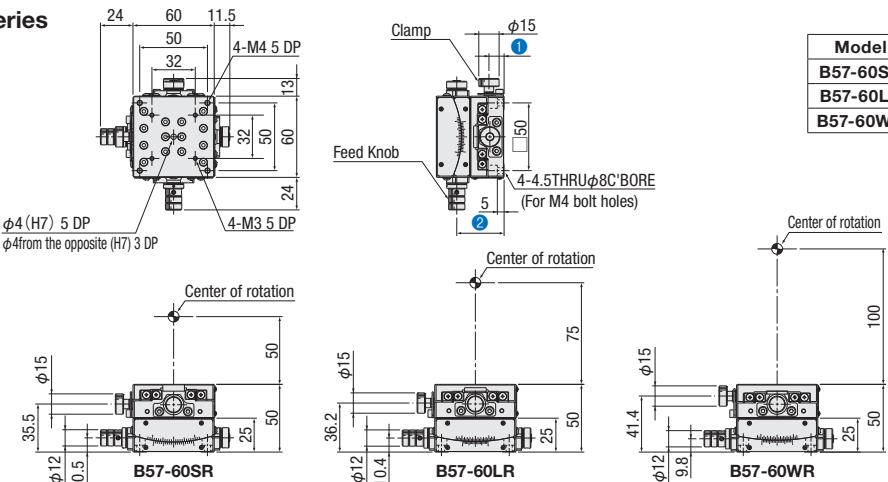
Dimensional outline drawings (2-axis)

**B57-60 series**



Model	WD (mm)	① (mm)	② (mm)
B57-60	50	11.3	35.0
B57-60L	75	16.4	35.5
B57-60W	100	16.3	35.4

**B57-60R series**



Model	WD (mm)	① (mm)	② (mm)
B57-60SR	50	11.3	35.0
B57-60LR	75	16.4	35.5
B57-60WR	100	16.3	35.4

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other

## Cross Roller Goniometer Stage (Worm type) □70: B56/B57-70 Series

### 1-axis

B56-70 series B56-70U



B56-70R series B56-70UR



### 2-axis

B57-70 series B57-70U



■ High cost performance goniometer stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in repeatability motion with good operation.

### Other 70×70mm Stage

• Cross roller goniometer stage



Micrometer  
Center pushing type  
B58-70A series  
▶ P.2-157~



Micrometer  
Side pushing type  
B58-70C series  
▶ P.2-165~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

Cross Roller

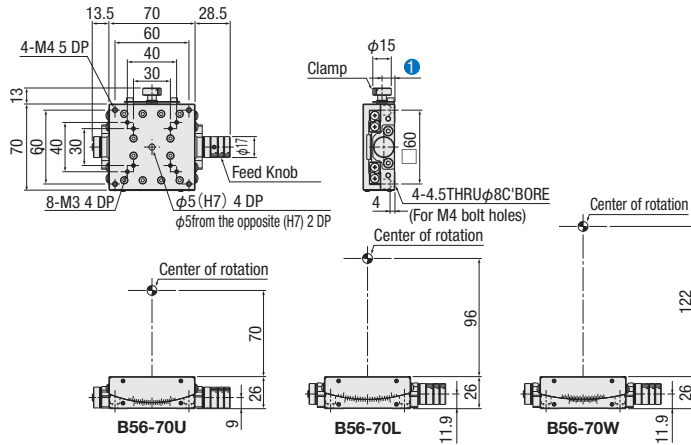
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

### SPEC

Axis	1-axis			2-axis	
Model	B56-70U	B56-70L	B56-70W	B57-70U	B57-70L
(Opposite hand)	B56-70UR	B56-70LR	B56-70WR	B57-70UR	B57-70LR
Stage table size	70×70mm				
Heights of the center of rotation	70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm
Center of rotation precision	Under 0.01mm				
Travel distance	±9.0°	±7.0°	±5.0°	(Up) ±9° (Down) ±7°	(Up) ±7° (Down) ±5°
Vernier minimum reading	Vernier scale 0.1°			(Up) 0.10° (Down) 0.10°	(Up) 0.10° (Down) 0.10°
Travel per Knob	≒1.53°	≒1.20°	≒0.96°	(Up) ≒1.53° (Down) ≒1.20°	(Up) ≒1.20° (Down) ≒0.96°
Guide	Cross roller guide				
Load capacity	5.0kgf [49.0N]			4.5kgf [44.1N]	
Allowable load for moment	Pitch	3.6N · m		3.6N · m	
	Yaw	2.8N · m		2.8N · m	
	Roll	5.7N · m		3.6N · m	
Moment rigidity	Pitch	0.17"/N · cm		0.23"/N · cm	
	Yaw	0.06"/N · cm		0.12"/N · cm	
	Roll	0.06"/N · cm		0.23"/N · cm	
Weight	0.57kg			1.14kg	
Main material—Surface finishing	Aluminum—White alumite processing				
Provided screws (Hex socket screws)	4 of M4—8				

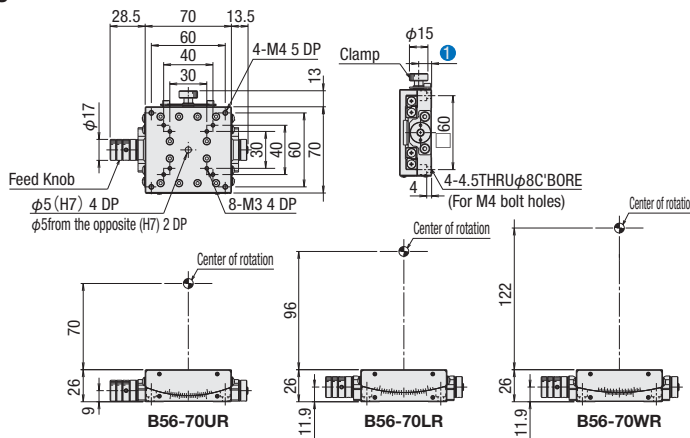
Dimensional outline drawings(1-axis)

**B56-70 series**



Model	WD (mm)	$\phi$ (mm)
B56-70U	70	10.5
B56-70L	96	12.5
B56-70W	122	12.5

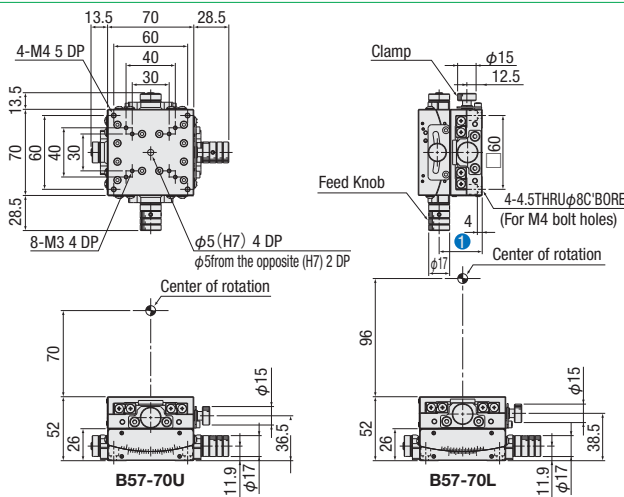
**B56-70R series**



Model	WD (mm)	$\phi$ (mm)
B56-70UR	70	10.5
B56-70LR	96	12.5
B56-70WR	122	12.5

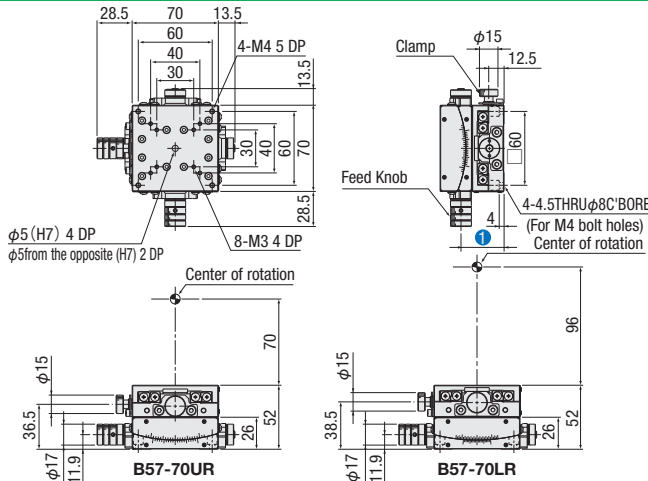
Dimensional outline drawings(2-axis)

**B57-70 series**



Model	WD (mm)	$\phi$ (mm)
B57-70U	70	35
B57-70L	96	37.9

**B57-70R series**



Model	WD (mm)	$\phi$ (mm)
B57-70UR	70	35
B57-70LR	96	37.9

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

## Cross Roller Goniometer Stage (Micrometer Center Pushing Type) □50: B58/B59-50A Series

### 1-axis

B58-50A series (B58-50LA)



B58-50AR series (B58-50UAR)



### 2-axis

B59-50A series (B59-50UA)



B59-50AR series (B59-50UAR)



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 50×50mm Stage

• Dovetail goniometer stage



B54-50 series  
▶ P.2-143~

• Cross roller goniometer stage



Worm type  
B56-50 series  
▶ P.2-149~

• Cross roller goniometer stage



Micrometer  
Side pushing type  
B58-50C series  
▶ P.2-161~

X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross  
Roller

□25

□30

□40

□50

□60

□70

□80

□100

□120

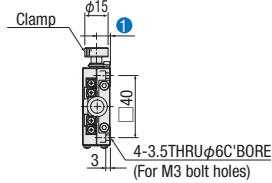
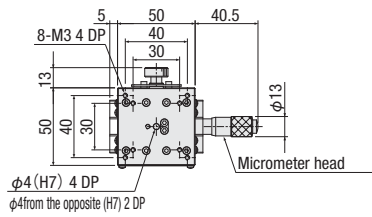
Other

### SPEC

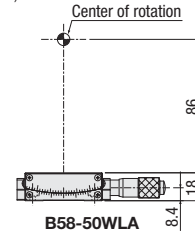
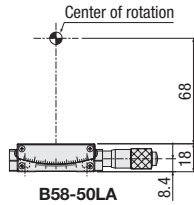
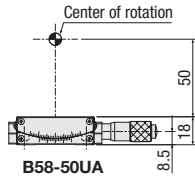
Axis	1-axis					2-axis	
	B58-50UA	B58-50LA	B58-50WLA	B59-50UA	B59-50LA		
Model	B58-50UA	B58-50LA	B58-50WLA	B59-50UA	B59-50LA		
(Opposite hand)	B58-50UAR	B58-50LAR	B58-50WLAR	B59-50UAR	B59-50LAR		
Stage table size	50×50mm						
Feeding position	Center						
Heights of the center of rotation	50±0.2mm	68±0.2mm	86±0.2mm	50±0.4mm	68±0.4mm		
Center of rotation precision	Under 0.01mm						
Travel distance	±3.0°					(Up) ±3.0° (Down) ±3.0°	
Minimum reading of micrometer	≒35"/Scale	≒27"/Scale	≒22"/Scale	(Up) ≒35" (Down) ≒27"	(Up) ≒27" (Down) ≒22"		
Guide	Cross roller guide						
Load capacity	3.0kgf [29.4N]			2.8kgf [27.4N]			
Allowable load for moment	Pitch	1.5N · m			1.5N · m		
	Yaw	1.2N · m			1.2N · m		
	Roll	2.5N · m			1.5N · m		
Moment rigidity	Pitch	0.60"/N · cm			0.97"/N · cm		
	Yaw	0.26"/N · cm			0.52"/N · cm		
	Roll	0.37"/N · cm			0.97"/N · cm		
Weight	0.22kg			0.44kg			
Main material—Surface finishing	Aluminum—White alumite processing						
Provided screws (Hex socket screws)	4 of M3—6						

Dimensional outline drawings(1-axis)

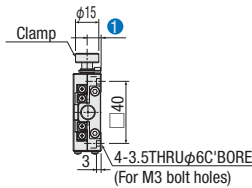
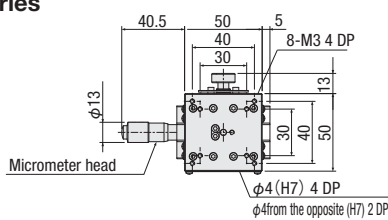
**B58-50A series**



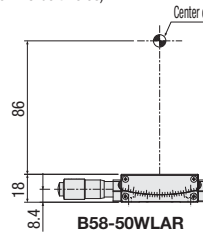
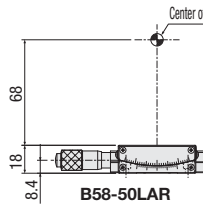
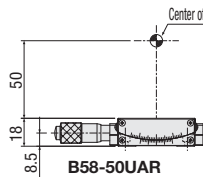
Model	WD (mm)	① (mm)
B58-50UA	50	9
B58-50LA	68	9.9
B58-50WLA	86	9.9



**B58-50AR series**

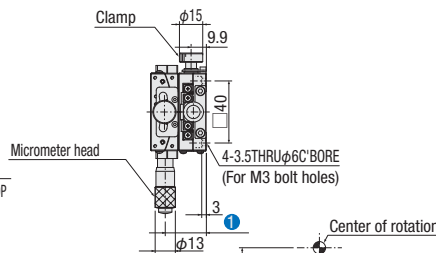
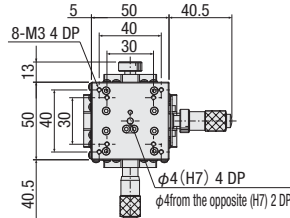


Model	WD (mm)	① (mm)
B58-50UAR	50	9
B58-50LAR	68	9.9
B58-50WLAR	86	9.9

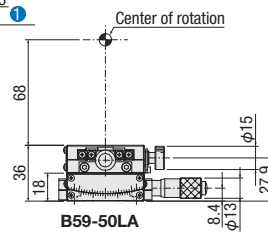
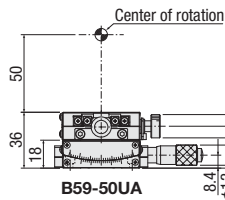


Dimensional outline drawings(2-axis)

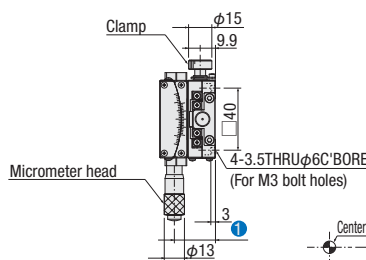
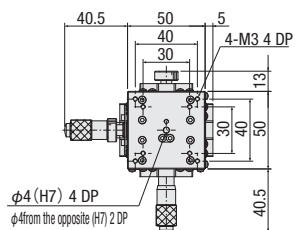
**B59-50A series**



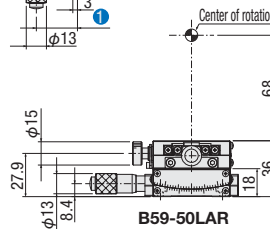
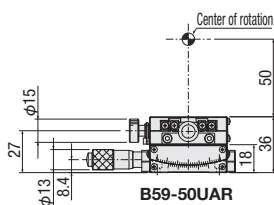
Model	WD (mm)	① (mm)
B59-50UA	50	26.5
B59-50LA	68	26.4



**B59-50AR series**



Model	WD (mm)	① (mm)
B59-50UAR	50	26.5
B59-50LAR	68	26.4



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

□ 25

□ 30

□ 40

□ 50

□ 60

□ 70

□ 80

□ 100

□ 120

Other

## Cross Roller Goniometer Stage (Micrometer Center Pushing Type) □70: B58/B59-70A Series

Manual goniometer stage

### 1-axis

B58-70A series (B58-70LA)



B58-70AR series (B58-70LAR)



RoHS

### 2-axis

B59-70A series (B59-70UA)



B59-70AR series (B59-70UAR)



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 70×70mm Stage

• Cross roller goniometer stage



Worm type  
B56-70 series  
▶ P.2-153~



Micrometer  
Side pushing type  
B58-70C series  
▶ P.2-165~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

Cross Roller

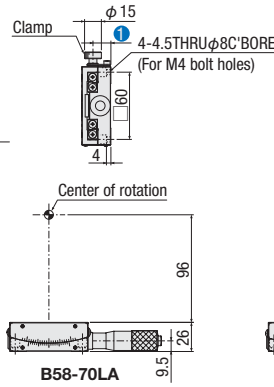
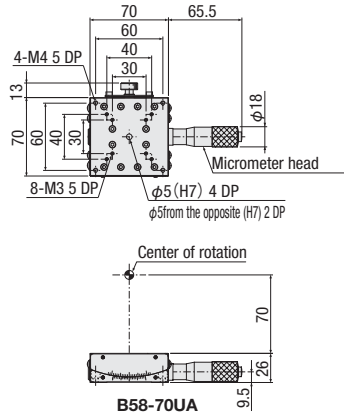
- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

### SPEC

Axis	1-axis					2-axis	
	B58-70UA	B58-70LA	B58-70WLA	B58-70WLA	B59-70UA	B59-70LA	
Model	B58-70UA	B58-70LA	B58-70WLA	B58-70WLA	B59-70UA	B59-70LA	
(Opposite hand)	B58-70UAR	B58-70LAR	B58-70WLAR	B58-70WLAR	B59-70UAR	B59-70LAR	
Stage table size	70×70mm						
Feeding position	Center						
Heights of the center of rotation	70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm		
Center of rotation precision	Under 0.01mm						
Travel distance	±3.0°						
Minimum reading of micrometer	≒24"/Scale	≒18"/Scale	≒15"/Scale	≒15"/Scale	(Up) ±3.0° (Down) ±3.0°	(Up) ±3.0° (Down) ±3.0°	
Guide	Cross roller guide						
Load capacity	5.0kgf [49.0N]				4.5kgf [44.1N]		
Allowable load for moment	Pitch	3.6N · m				3.6N · m	
	Yaw	2.8N · m				2.8N · m	
	Roll	5.7N · m				3.6N · m	
Moment rigidity	Pitch	0.17"/N · cm				0.23"/N · cm	
	Yaw	0.06"/N · cm				0.12"/N · cm	
	Roll	0.06"/N · cm				0.23"/N · cm	
Weight	0.52kg				1.04kg		
Main material—Surface finishing	Aluminum—White alumite processing						
Provided screws (Hex socket screws)	4 of M4—8						

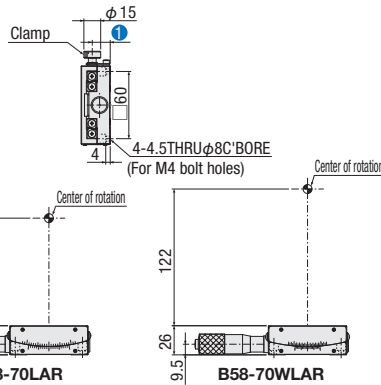
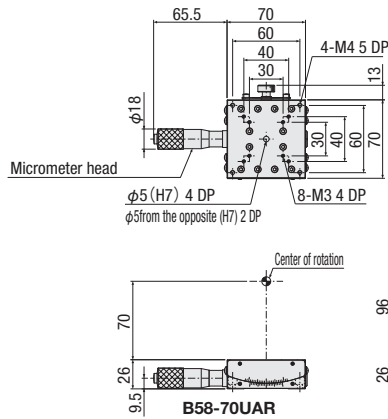
Dimensional outline drawings(1-axis)

**B58-70A series**



Model	WD (mm)	φ (mm)
B58-70UA	70	16
B58-70LA	96	17.5
B58-70WLA	122	

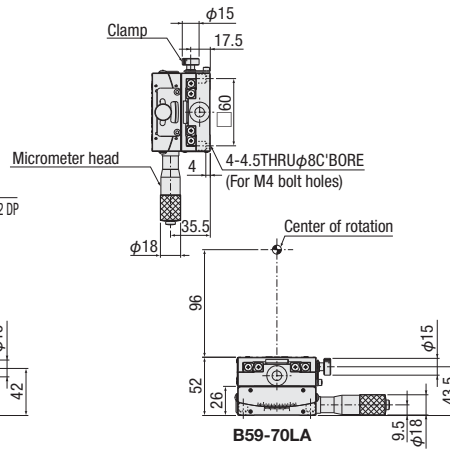
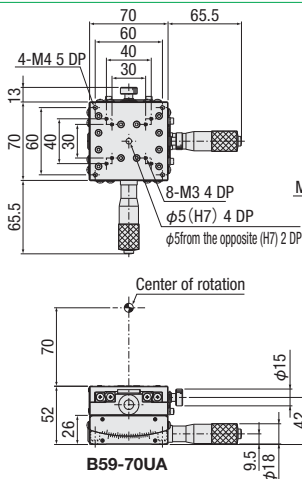
**B58-70AR series**



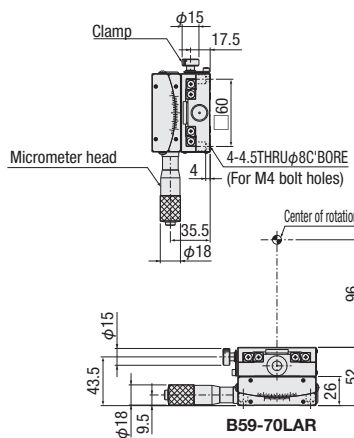
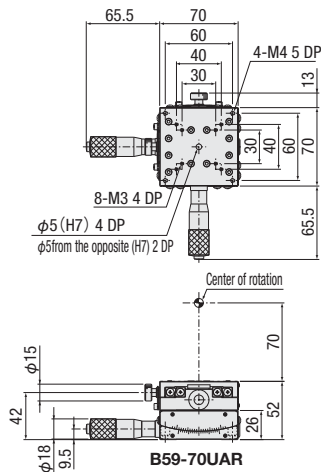
Model	WD (mm)	φ (mm)
B58-70UAR	70	16
B58-70LAR	96	17.5
B58-70WLAR	122	17.5

Dimensional outline drawings(2-axis)

**B59-70A series**



**B59-70AR series**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

70

80

100

120

Other



## Cross Roller Goniometer Stage (Micrometer Side Pushing Type) □40: B58/B59-40 Series

### 1-axis

B58-40C series (B58-40LC)



B58-40CR series (B58-40LCR)



### 2-axis

B59-40 series (B59-40W)



B59-40R series (B59-40WR)



■High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 40×40mm Stage

• Dovetail goniometer stage



B54-40 series  
P.2-141~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

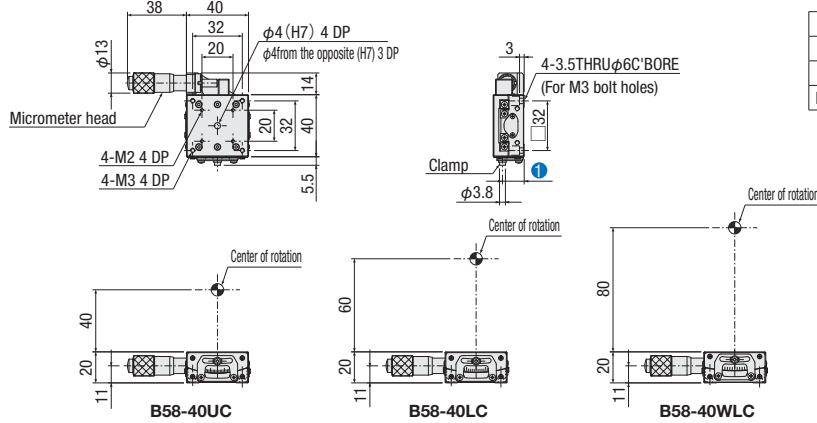
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

SPEC					
Axis	1-axis			2-axis	
Model	B58-40UC	B58-40LC	B58-40WLC	B59-40	B59-40W
(Opposite hand)	B58-40UCR	B58-40LCR	B58-40WLCR	B59-40R	B59-40WR
Stage table size	40×40mm				
Feeding position	Side				
Heights of the center of rotation	40±0.2mm	60±0.2mm	80±0.2mm	40±0.4mm	60±0.4mm
Center of rotation precision	Under 0.01mm				
Travel distance	±7.0°	±4.0°		(Up) ±7.0° (Down) ±4.0°	(Up) ±4.0° (Down) ±4.0°
Minimum reading of micrometer	≒42"/Scale	≒30"/Scale	≒23"/Scale	(Up) ≒42" (Down) ≒30"	(Up) ≒30" (Down) ≒23"
Guide	Cross roller guide				
Load capacity	3.0kgf [29.4N]			2.8kgf [27.4N]	
Allowable load for moment	Pitch	1.0N · m			1.0N · m
	Yaw	0.8N · m			0.8N · m
	Roll	0.9N · m			0.9N · m
Moment rigidity	Pitch	1.30"/N · cm			1.57"/N · cm
	Yaw	1.15"/N · cm			2.30"/N · cm
	Roll	0.27"/N · cm			1.57"/N · cm
Weight	0.13kg			0.26kg	
Main material—Surface finishing	Aluminum—Black alumite processing				
Provided screws (Hex socket screws)	4 of M3—6				

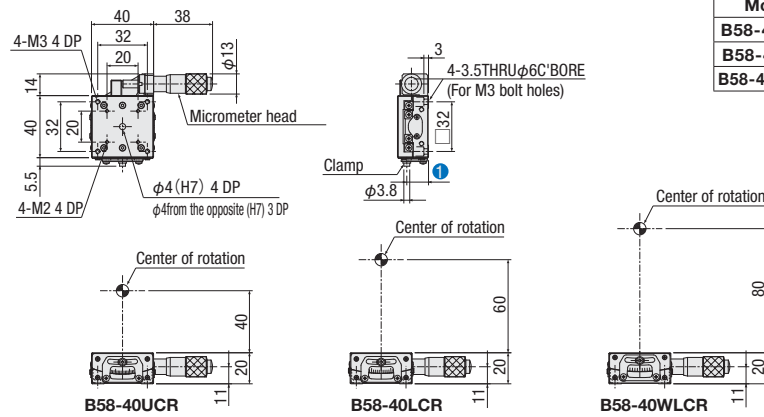
Dimensional outline drawings(1-axis)

**B58-40C series**



Model	WD (mm)	① (mm)
B58-40UC	40	14
B58-40LC	60	14
B58-40WLC	80	15

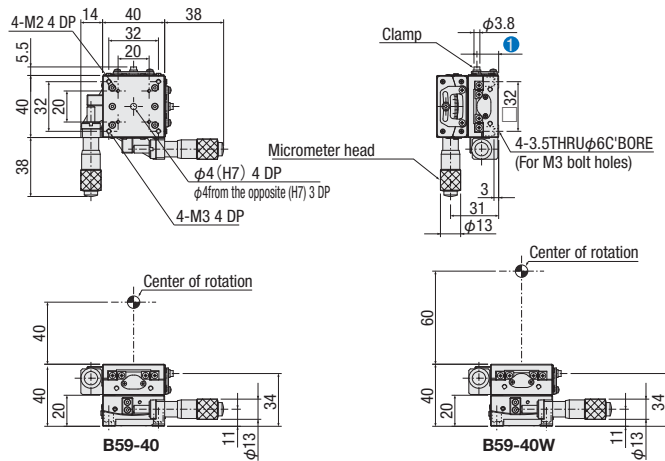
**B58-40CR series**



Model	WD (mm)	① (mm)
B58-40UCR	40	14
B58-40LCR	60	14
B58-40WLCR	80	15

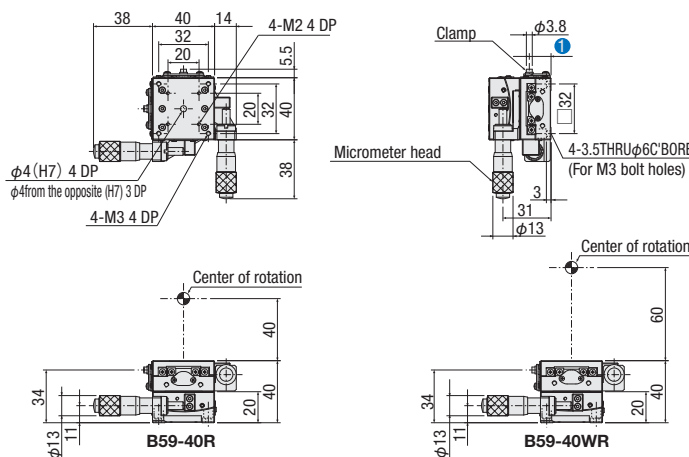
Dimensional outline drawings(2-axis)

**B59-40 series**



Model	WD (mm)	① (mm)
B59-40	40	14
B59-40W	60	15

**B59-40R series**



Model	WD (mm)	① (mm)
B59-40R	40	14
B59-40WR	60	15

Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

2

160

## Cross Roller Goniometer Stage (Micrometer Side Pushing Type) □50: B58/B59-50 Series

Manual goniometer stage

RoHS

### 1-axis

B58-50C series (B58-50LC)



B58-50CR series (B58-50LCR)



### 2-axis

B59-50 series (B59-50U)



B59-50R series (B59-50UR)



■High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 50×50mm Stage

• Dovetail goniometer stage



B54-50 series  
▶P.2-143~

• Cross roller goniometer stage



Worm type  
B56-50 series  
▶P.2-149~



Micrometer  
Center pushing type  
B58-50A series  
▶P.2-155~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

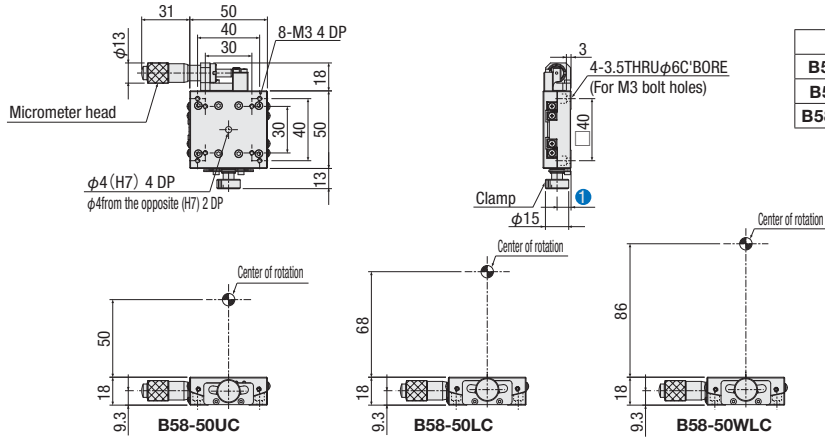
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

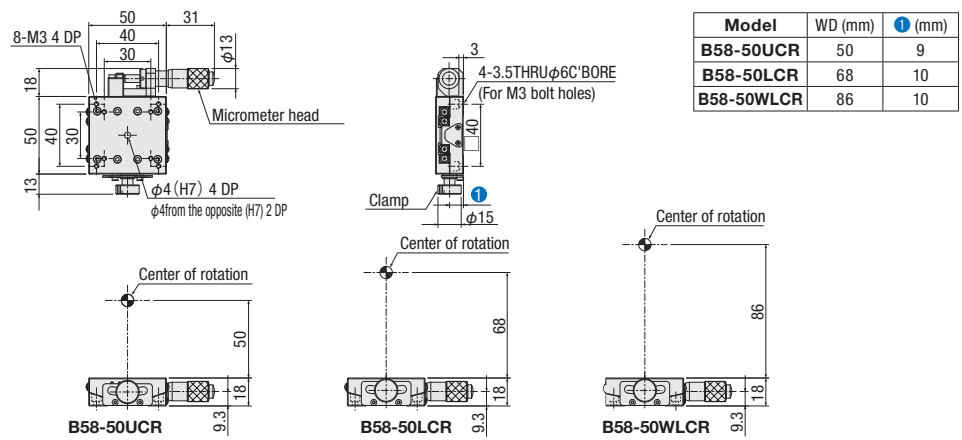
SPEC					
Axis	1-axis			2-axis	
Model	B58-50UC	B58-50LC	B58-50WLC	B59-50U	B59-50L
(Opposite hand)	B58-50UCR	B58-50LCR	B58-50WLCR	B59-50UR	B59-50LR
Stage table size	50×50mm				
Feeding position	Side				
Heights of the center of rotation	50±0.2mm	68±0.2mm	86±0.2mm	50±0.4mm	68±0.4mm
Center of rotation precision	Under 0.01mm			—	
Travel distance	±3.0°			(Up) ±3.0° (Down) ±3.0°	
Minimum reading of micrometer	≒35"/Scale	≒27"/Scale	≒22"/Scale	(Up) ≒35" (Down) ≒27"	(Up) ≒27" (Down) ≒22"
Guide	Cross roller guide				
Load capacity	3.0kgf [29.4N]			2.8kgf [27.4N]	
Allowable load for moment	Pitch	1.5N · m		1.5N · m	
	Yaw	1.2N · m		1.2N · m	
	Roll	2.5N · m		1.5N · m	
Moment rigidity	Pitch	0.60"/N · cm		0.97"/N · cm	
	Yaw	0.26"/N · cm		0.52"/N · cm	
	Roll	0.37"/N · cm		0.97"/N · cm	
Weight	0.23kg			0.46kg	
Main material—Surface finishing	Aluminum—White alumite processing				
Provided screws (Hex socket screws)	4 of M3—6				

Dimensional outline drawings(1-axis)

**B58-50C series**

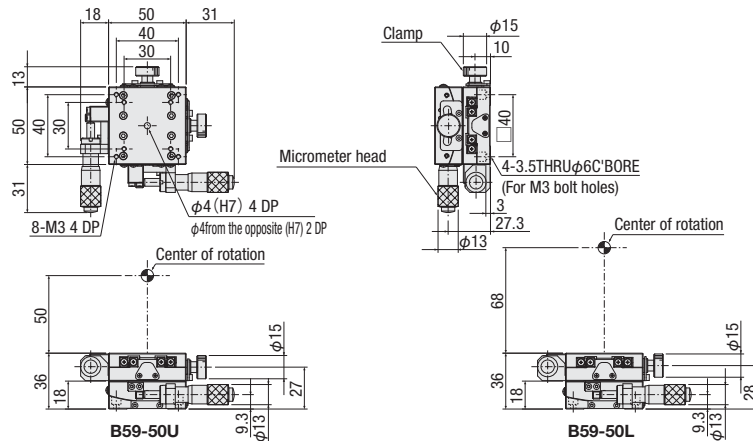


**B58-50CR series**

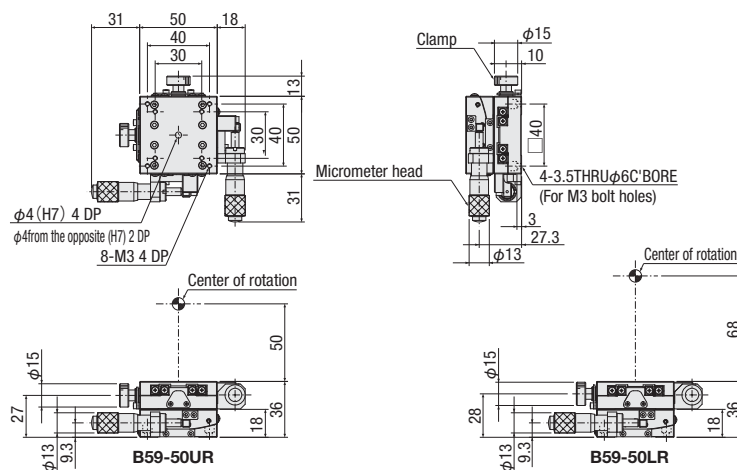


Dimensional outline drawings(2-axis)

**B59-50 series**



**B59-50R series**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

2

162

## Cross Roller Goniometer Stage (Micrometer Side Pushing Type) □60: B58/B59-60 Series

Manual goniometer stage

### 1-axis

B58-60C series (B58-60LC)



B58-60CR series (B58-60LCR)



RoHS

### 2-axis

B59-60 series (B59-60T)



B59-60R series (B59-60TR)



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 60×60mm Stage

• Dovetail goniometer stage



Worm type  
B54-60 series  
P.2-145~

• cross roller goniometer stage



Worm type  
B56-60U series  
P.2-151~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

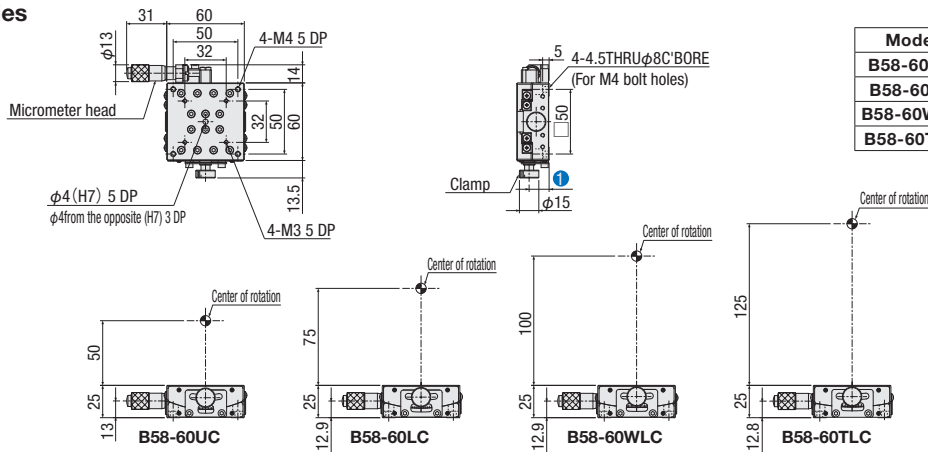
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

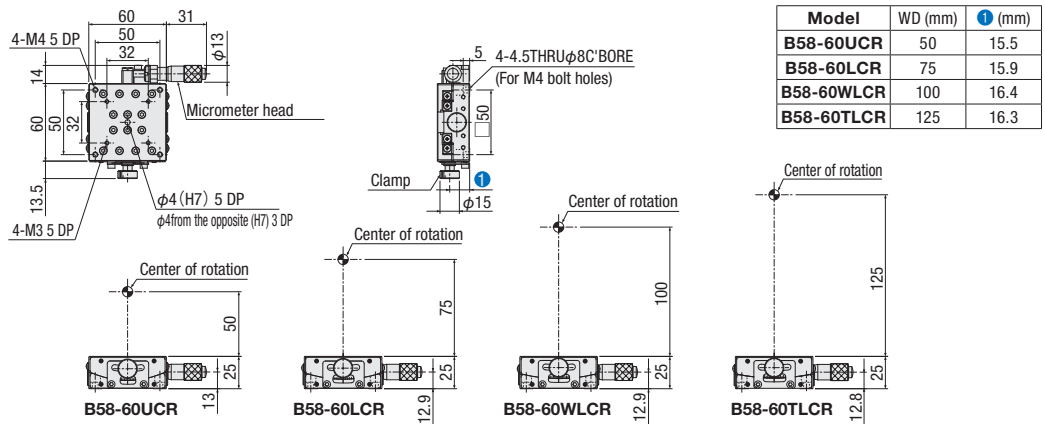
SPEC							
Axis	1-axis				2-axis		
Model	B58-60UC	B58-60LC	B58-60WLC	B58-60TLC	B59-60	B59-60W	B59-60T
(Opposite hand)	B58-60UCR	B58-60LCR	B58-60WLCR	B58-60TLCR	B59-60R	B59-60WR	B59-60TR
Stage table size	60×60mm						
Feeding position	Side						
Heights of the center of rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm	50±0.4mm	75±0.4mm	100±0.4mm
Center of rotation precision	Under 0.01mm						
Travel distance	±4.0°		±3.0°	±2.5°	(Up) ±4.0° (Down) ±4.0°	(Up) ±4.0° (Down) ±3.0°	(Up) ±3.0° (Down) ±2.5°
Minimum reading of micrometer	≒33"/Scale	≒24"/Scale	≒18"/Scale	≒15"/Scale	(Up) ≒33" (Down) ≒24"	(Up) ≒24" (Down) ≒18"	(Up) ≒18" (Down) ≒15"
Guide	Cross roller guide						
Load capacity	5.0kgf [49.0N]				4.7kgf [46.0N]		
Allowable load for moment	Pitch	1.5N · m				1.5N · m	
	Yaw	2.0N · m				2.0N · m	
	Roll	2.6N · m				1.5N · m	
Moment rigidity	Pitch	0.27"/N · cm				0.37"/N · cm	
	Yaw	0.09"/N · cm				0.18"/N · cm	
	Roll	0.10"/N · cm				0.37"/N · cm	
Weight	0.31kg		0.30kg		0.62kg		0.60kg
Main material—Surface finishing	Aluminum—Black alumite processing						
Provided screws (Hex socket screws)	4 of M4—10						

Dimensional outline drawings(1-axis)

**B58-60C series**

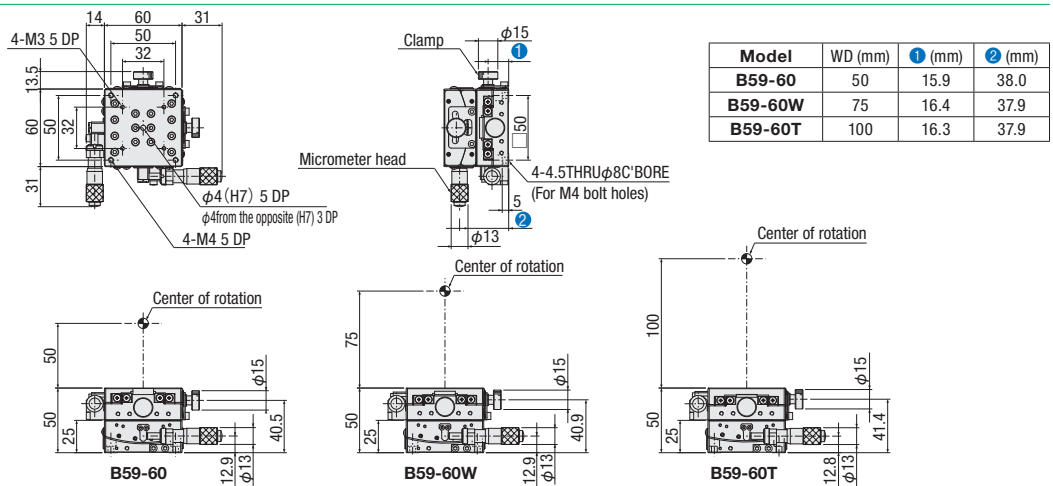


**B58-60CR series**

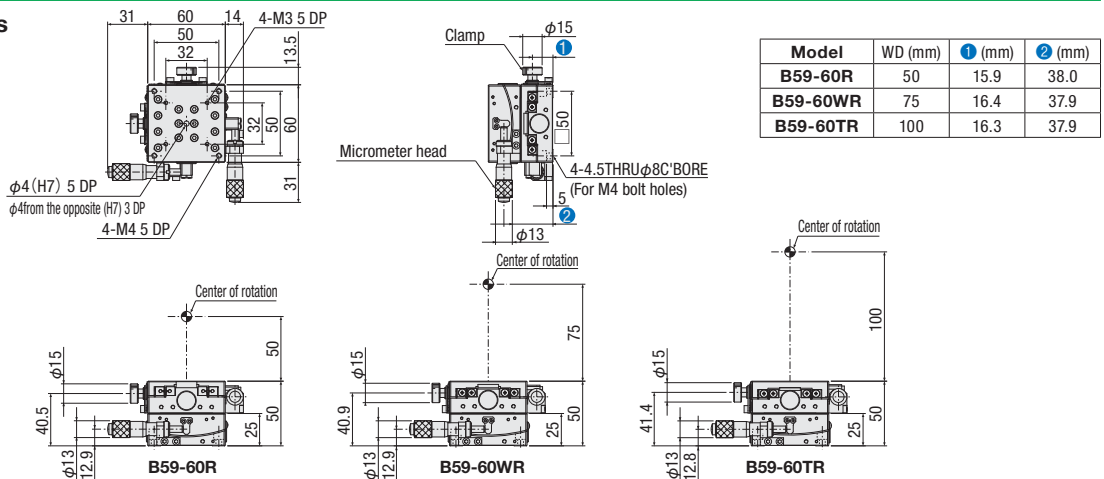


Dimensional outline drawings(2-axis)

**B59-60 series**



**B59-60R series**



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

25

30

40

50

60

70

80

100

120

Other

## Cross Roller Goniometer Stage (Micrometer Side Pushing Type) □70: B58/B59-70 Series

### 1-axis

B58-70C series (B58-70WLC)



B58-70CR series (B58-70WLCR)



### 2-axis

B59-70 series (B59-70U)



B59-70R series (B59-70UR)



■ High cost performance gonio stage which dovetail system is adapted for a travel guide, and worm gear system is adapted for feeding mechanism. Center of rotation runout accuracy is under 0.01mm(1-axis) Ideal for use in fine positioning.

### Other 70×70mm Stage

• Cross roller goniometer stage



Worm type  
B56-70 series  
▶ P.2-153~



Micrometer  
Center pushing type  
B58-70A series  
▶ P.2-157~

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

Dovetail

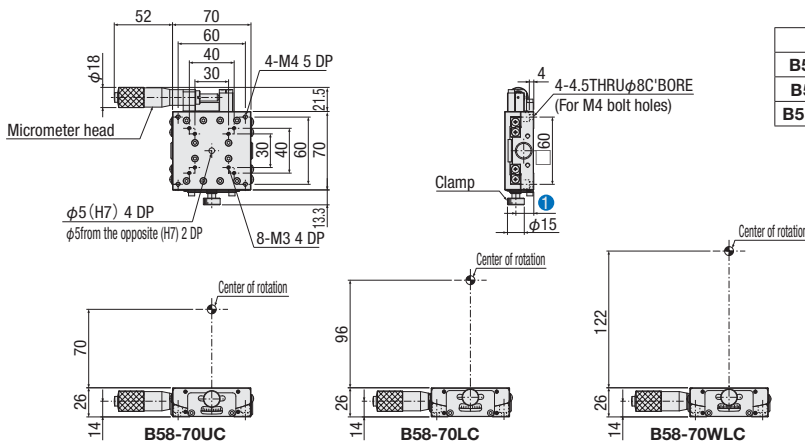
Cross Roller

- 25
- 30
- 40
- 50
- 60
- 70
- 80
- 100
- 120
- Other

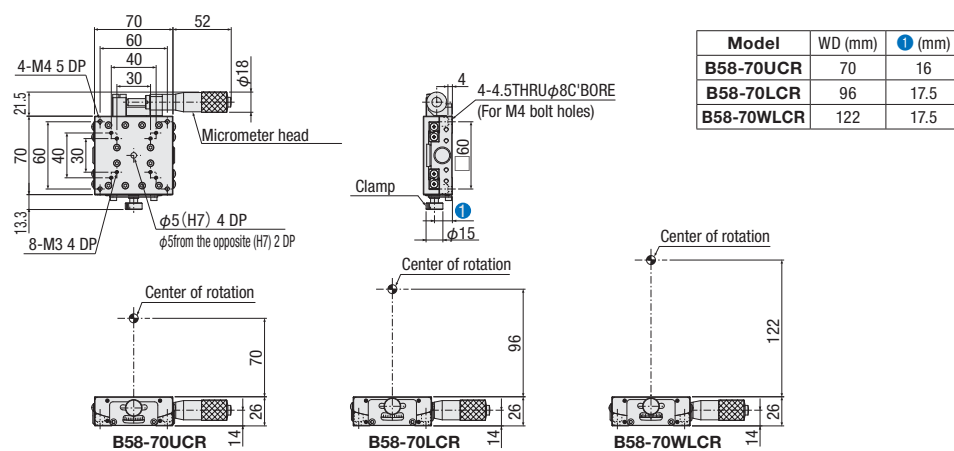
SPEC					
Axis	1-axis			2-axis	
Model	B58-70UC	B58-70LC	B58-70WLC	B59-70U	B59-70L
(Opposite hand)	B58-70UCR	B58-70LCR	B58-70WLCR	B59-70UR	B59-70LR
Stage table size	70×70mm				
Feeding position	Side				
Heights of the center of rotation	70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm
Center of rotation precision	Under 0.01mm			—	
Travel distance	±3.0°			(Up) ±3.0° (Down) ±3.0°	
Minimum reading of micrometer	≒25"/Scale	≒19"/Scale	≒15"/Scale	(Up) ≒25" (Down) ≒19"	(Up) ≒19" (Down) ≒15"
Guide	Cross roller guide				
Load capacity	5.0kgf [49.0N]			4.5kgf [44.1N]	
Allowable load for moment	Pitch	3.6N · m			3.6N · m
	Yaw	2.8N · m			2.8N · m
	Roll	5.7N · m			3.6N · m
Moment rigidity	Pitch	0.17"/N · cm			0.23"/N · cm
	Yaw	0.06"/N · cm			0.12"/N · cm
	Roll	0.06"/N · cm			0.23"/N · cm
Weight	0.53kg			1.06kg	
Main material—Surface finishing	Aluminum—White alumite processing				
Provided screws (Hex socket screws)	4 of M4—8				

Dimensional outline drawings (1-axis)

**B58-70C series**

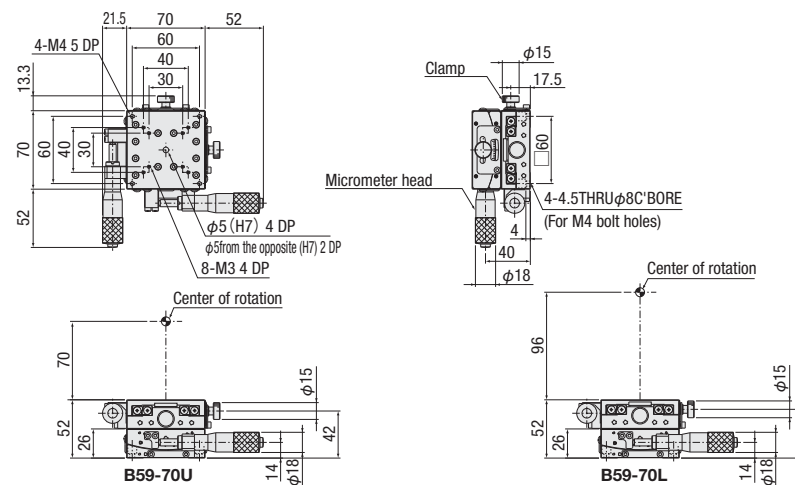


**B58-70CR series**

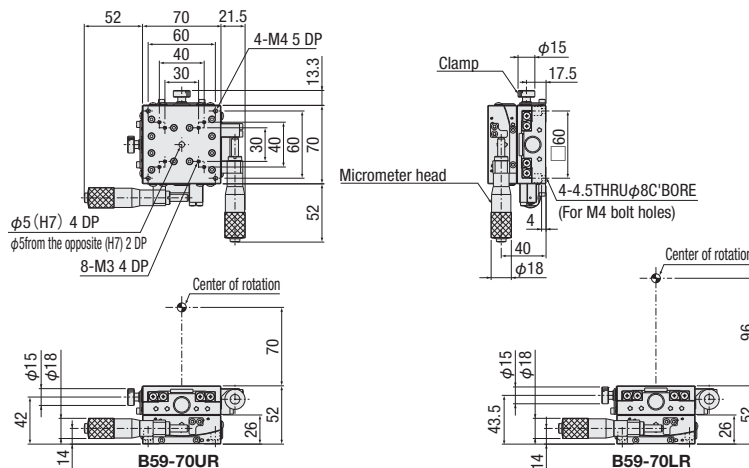


Dimensional outline drawings (2-axis)

**B59-70 series**



**B59-70R series**



Manual goniometer stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Dovetail

Cross Roller

- 25
- 30
- 40
- 50
- 70
- 80
- 100
- 120
- Other



## Manual Rotary Stage Guidance



Can be positioned a sample rotation from coarse to fine adjustment.  
Available angle scales on the side for repeatability positioning.  
(Square type excluded.)

### Features



#### Fitting type B43 ◀ P.2-171~

Fitting stage allows coarse 360 degree rotation and fine-control (micrometer head).  
Can be widely used for R&D and integration in devices.

Stage size	φ24mm	φ38mm	φ60mm	φ85mm	φ110mm
------------	-------	-------	-------	-------	--------



#### Cross roller bearing type B44/BS43 ◀ P.2-173~

Stages that use crossed roller bearing allows coarse 360 degree rotation and fine-control(micrometer head).

The rigidity is higher than a fitting type.

Selectable stages made of aluminum or stainless steel.

Stage size	φ60mm
------------	-------



#### Transmission hole type B47 ◀ P.2-173

Stage that use crossed roller bearing allows coarse 360 degree rotation and fine-control (micrometer head). There is a transmission hole in the center of the stage for passing laser beam and organization of the wires.

Stage size	φ100mm
------------	--------



#### Square type BRE ◀ P.2-169~

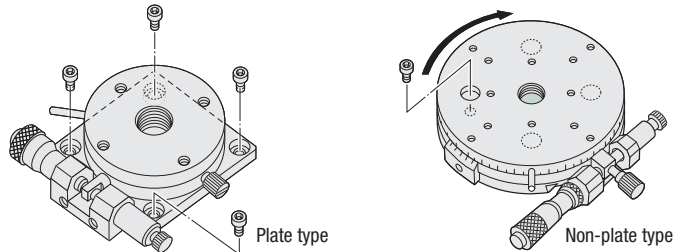
A square rotary stage that can be readily combined with a square linear stage and goniometer.

Stage size	40×40mm	60×60mm
------------	---------	---------

## For use correctly

### ▽How to mount

- Plate type..... Fix by supplied screw to the 4 places hole on the lower plate.
- Non-plate type..... Move the bolt hole on the top surface roughly to align it with bolt holes on the lower surface of the stage.

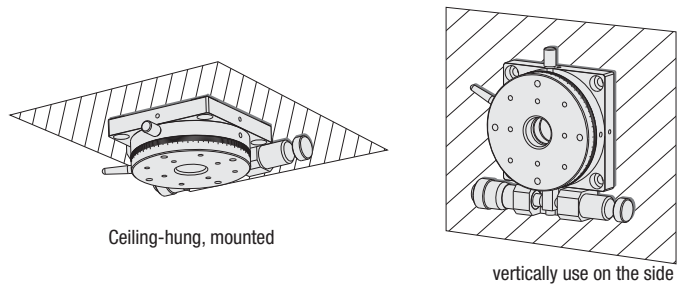


### ▽About object on the upper or lower stage.

Stage surface might be deformed and mounting unflat object and set to the unflat place can affect to be deformed stage surface and decreasing accuracy.

### ▽Position of stage mounting

All products SPEC shows must be shown flat setting condition.  
 Pay attention to mount such as up side down, vertical on the side and horizontal on the side.  
 Load capacity and accuracy might be changed by the positioning.  
 Please feel free to ask us for more information.



#### • Posture characteristic list for each products

Travel guide	Inverted and reversed	Side horizontal	vertically use on the side
Fitting	△	△	△
Cross roller	○	△	△
Ball bearing	×	×	×

○: Available under limit of load or moment  
 △: Accuracy might be decreased under limit of load or moment  
 ×: Not available

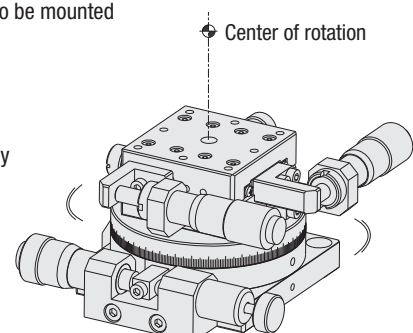
## How to align rotating center axis

The stage deliver their inherent performance by aligning the center axis of another device or work to be mounted as much as possible.

We recommend that you align the center axis using the method shown below.

- Determine the position in which the center deviation becomes the smallest using the dial gauge by rotating the rotary stage.
- Fix the stage or work. The center of axis can be fine-adjusted easily by combining XY stages.

※ No mounting reference surface on stage main body.



## Rotary Stage BRE Series □40□60: BRE04020/BRE06020

RoHS



BRE04020



BRE06020

Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

□25

□30

□40

□50

□60

□70

□80

□100

□120

Other

1 Model

# BRE04020

1

2

1 Stage table size

04	40mm
06	60mm

2 Travel distance

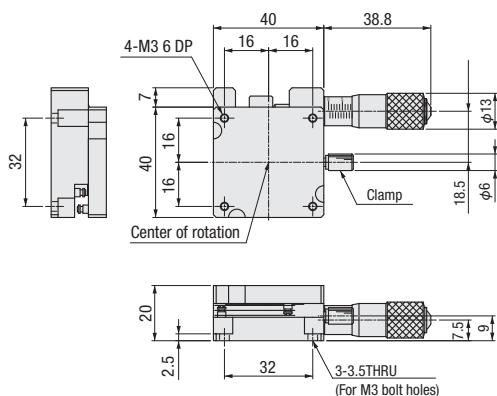
020	20°
-----	-----

### SPEC

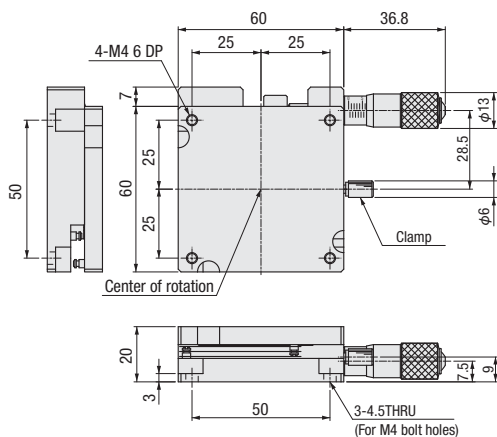
Model	BRE04020	BRE06020
Stage table size	40×40mm	60×60mm
Travel distance	±10°	±10°
Minimum reading of micrometer	≒1'51"	≒1'12"
Travel guide	Fitting method	Fitting method
Load capacity	1kgf [9.8N]	3kgf [29.4N]
Parallelism	50μm	50μm
Weight	0.14kg	0.26kg
Main material—Surface finishing	Aluminum—Black alumite processing	Aluminum—Black alumite processing
Provided screws (Hex socket screws)	3 of M3—6	3 of M4—8

**Dimensional outline drawings**

**BRE04020**



**BRE06020**



Manual linear stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Linear Ball

Cross Roller

Dovetail

25

30

40

50

60

70

80

100

120

Other

2

170

## Rotary Stage (Fitting Type) $\phi 24 \sim 110$ : B43 Series

Manual rotation stage

RoHS

B43-25



B43-38N



B43-60N



B43-85N



B43-110N



■ Cross roller bearing stage that is available a rough motion 360 deg. rotation and micromotion (micrometer head). Low price. Ideal for use in R&D, integrating device and much more.

• Square rotation type (BRE series)

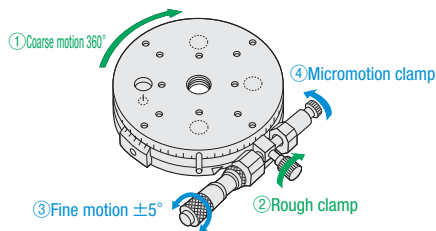


▶ P.2-169~

### How to use a rotary stage

Micromotion positioning after rough positioning

- ① A rough adjustment to the target angle with feeding knob
- ② Squeeze a rough clamp and fix.
- ③ A micromotion adjustment to the target angle with micrometer.
- ④ Squeeze a micromotion clamp and fix.



X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Fitting Type

Cross Roller

$\phi 24$

$\phi 38$

$\phi 60$

$\phi 85$

$\phi 100$

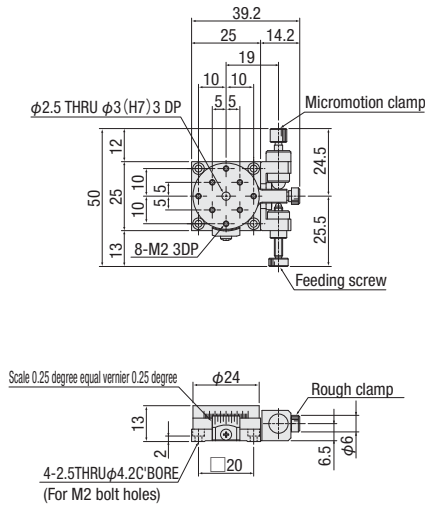
$\phi 110$

### SPEC

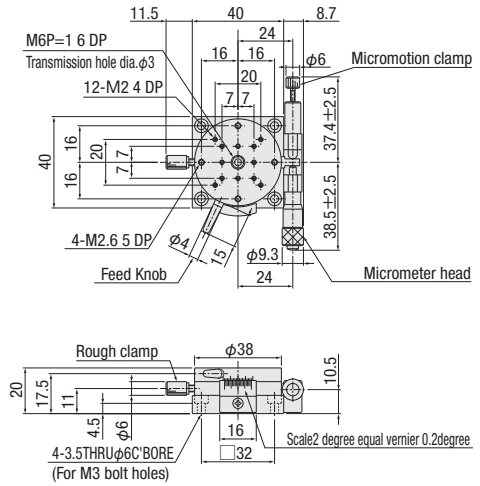
Model	B43-25	B43-38N	B43-60N	B43-85N	B43-110N
(Opposite hand)	B43-25R	B43-38NR	B43-60NR	B43-85NR	B43-110NR
Stage table size	$\phi 24\text{mm}$	$\phi 38\text{mm}$	$\phi 60\text{mm}$	$\phi 85\text{mm}$	$\phi 110\text{mm}$
Travel distance	Coarse motion $360^\circ$ Fine motion $\pm 3^\circ$		Coarse motion $360^\circ$ Fine motion $\pm 5^\circ$		
Vernier minimum reading	Vernier scale $0.25^\circ$		Vernier scale $0.2^\circ$		Vernier scale $0.1^\circ$
Minimum reading capability	$\approx 1.50^\circ/\text{Rotation}$	$\approx 1'26''/\text{Scale}$	$\approx 55''/\text{Scale}$	$\approx 43''/\text{Scale}$	$\approx 34''/\text{Scale}$
Guide	Fitting method				
Load capacity	1.0kgf [9.8N]		3.0kgf [29.4N]	4.0kgf [39.2N]	5.0kgf [49.0N]
Allowable load for moment	$0.12\text{N} \cdot \text{m}$	$0.3\text{N} \cdot \text{m}$	$0.7\text{N} \cdot \text{m}$	$1.2\text{N} \cdot \text{m}$	$1.5\text{N} \cdot \text{m}$
Moment rigidity	$8.11''/\text{N} \cdot \text{cm}$	$3.56''/\text{N} \cdot \text{cm}$	$0.41''/\text{N} \cdot \text{cm}$	$0.22''/\text{N} \cdot \text{cm}$	$0.17''/\text{N} \cdot \text{cm}$
Parallelism	$50\mu\text{m}$			$20\mu\text{m}$	
Eccentricity amount	$50\mu\text{m}$			$50\mu\text{m}$	
Runout amount	$20\mu\text{m}$			$20\mu\text{m}$	
Weight	0.03kg	0.09kg	0.28kg	0.48kg	0.75kg
Main material—Surface finishing	Aluminum—Black alumite processing				
Provided screws (Hex socket screws)	4 of M2—6	4 of M3—8	4 of M4—10	4 of M4—8	4 of M4—8

Dimensional outline drawings

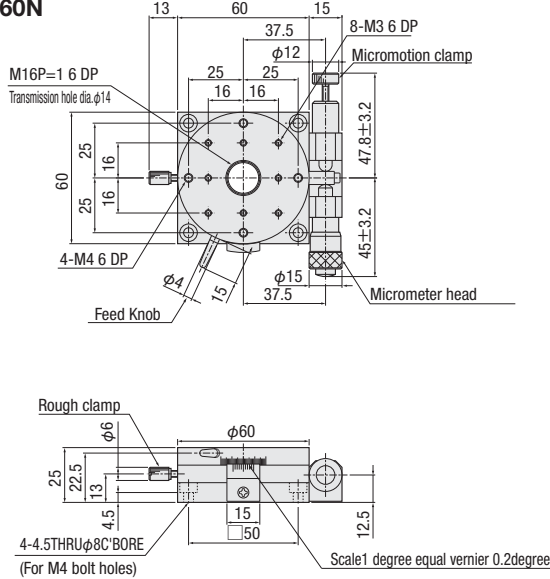
**B43-25**



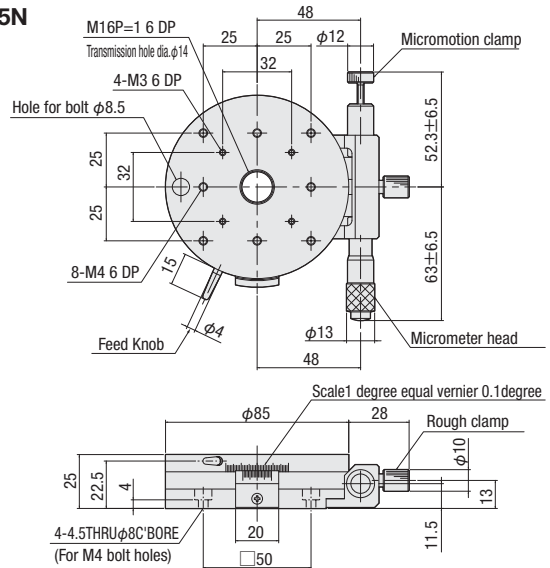
**B43-38N**



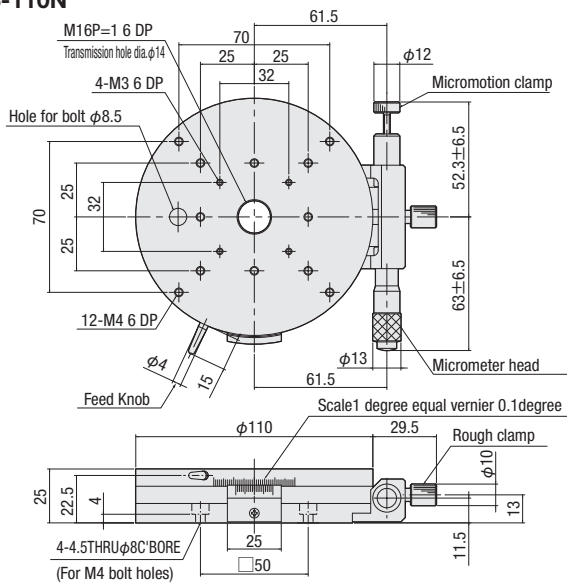
**B43-60N**



**B43-85N**



**B43-110N**



X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

Goniometer

Rotary

Unit

Accessories

Fitting  
Type

Cross  
Roller

φ 24

φ 38

φ 60

φ 85

φ 100

φ 110

2

172

# Manual Stage

## Rotary Stage (Cross Roller Bearing Type) $\phi 85 \cdot 100$ : B44/B47 Series

Manual Rotation Stage

B44-85N



B47-100AN



Transmission hole type

Available coarse motion 360 degree and fine motion (micrometer head). Rigidity is better than fitting type.

RoHS

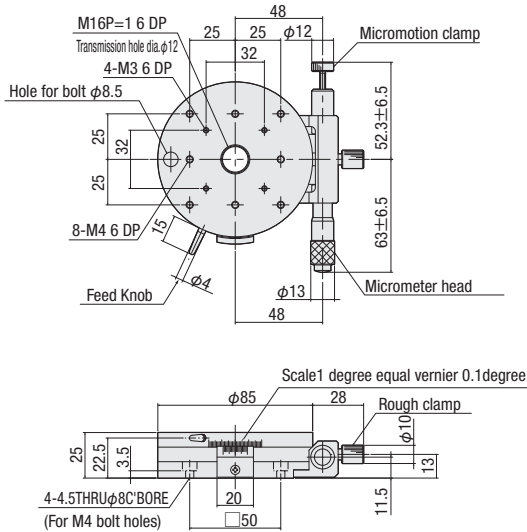
Transmission hole XY-axis cross roller guide B27 series P.2-077~

### Dimensional outline drawings

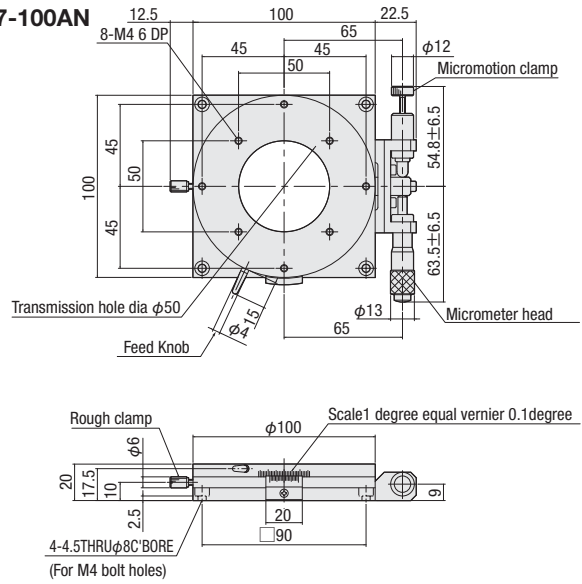
**SURUGA SEIKI**

CAD 3D·2D

B44-85N



B47-100AN



- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories

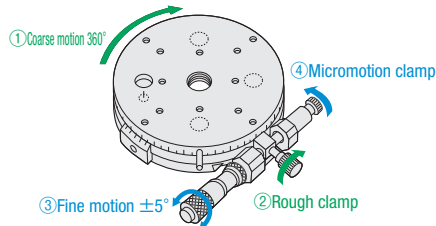
Fitting Type

Cross Roller

### How to use a rotary stage

Micromotion positioning after rough positioning

- ① A rough adjustment to the target angle with feeding knob
- ② Squeeze a rough clamp and fix.
- ③ A micromotion adjustment to the target angle with micrometer.
- ④ Squeeze a micromotion clamp and fix.



SPEC		
Model	B44-85N	B47-100AN
(Opposite hand)	B44-85NR	B47-100ANR
Stage table size	$\phi 85$ mm	$\phi 100$ mm
Travel distance	Coarse motion 360° Fine motion $\pm 5^\circ$	
Vernier minimum reading	Vernier scale 0.1°	
Minimum reading of micrometer	$\approx 43''$ /Scale	$\approx 32''$ /Scale
Guide	Cross roller bearing	
Load capacity	6.0kgf [58.8N]	
Allowable load for moment	5.0N · m	
Moment rigidity	0.36''/N · cm	0.13''/N · cm
Parallelism	50 $\mu$ m	
Eccentricity amount	50 $\mu$ m	
Runout amount	20 $\mu$ m	
Weight	0.43kg	0.45kg
Main material—Surface finishing	Aluminum—Black alumite processing	
Provided screws (Hex socket screws)	4 of M4—8	4 of M4—6

# Rotary Stage (Cross Roller Bearing Type (Stainless Type)) $\phi 60$ : BS43 Series

BS43-60



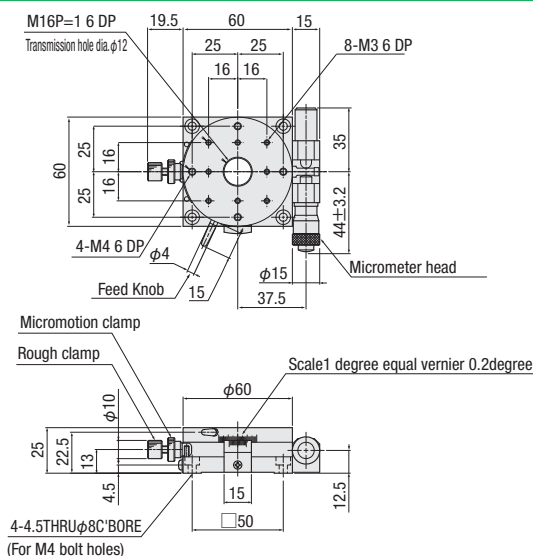
RoHS

■ Available coarse motion 360 degree and fine motion (micrometer head).  
High rigidity of materials because of stainless made.

**SURUGA SEIKI**

CAD  
3D·2D

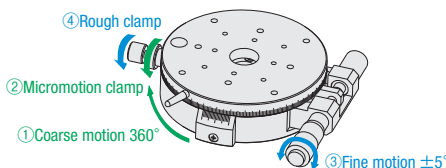
BS43-60



## How to use a rotary stage

Micromotion positioning after rough positioning

- ① A rough adjustment to the target angle with feeding knob
- ② Squeeze a rough clamp and fix.
- ③ A micromotion adjustment to the target angle with micrometer.
- ④ Squeeze a micromotion clamp and fix.



## SPEC

SPEC	
Model	BS43-60
(Opposite hand)	BS43-60R
Stage table size	$\phi 60$ mm
Travel distance	Coarse motion 360° Fine motion $\pm 5^\circ$
Vernier minimum reading	Vernier scale 0.2°
Minimum reading of micrometer	$\approx 5''$ / Scale
Guide	Cross roller bearing
Load capacity	5.0kgf [49.0N]
Allowable load for moment	5.0N · m
Moment rigidity	0.15'' / N · cm
Parallelism	50 $\mu$ m
Eccentricity amount	50 $\mu$ m
Runout amount	20 $\mu$ m
Weight	0.58kg
Main material—Surface finishing	Stainless
Provided screws (Hex socket screws)	4 of M4—8

Manual rotation stage

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

Fitting Type

Cross Roller

$\phi 24$

$\phi 38$

$\phi 60$

$\phi 85$

$\phi 100$

$\phi 110$

2

174



## Multi-axis Stage Unit

■ There are variety of stage unit.  
It is easy to select.

XYθ unit    B210-60CN    θXYunit    B230-60N    XYZθz unit    B240-60CN    XYZθxθy unit    B270-60C-L



RoHS

Manual stage unit

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

Accessories

SPEC														
NO.	Axis	Model	Load capacity (kgf [N])	Top Table surface Size (mm)	Mounted on base surface Size (mm)	External dimension (mm)			Center of rotation High(mm)	Unit				
						W	D	H		XY	Z	θx	θy	θz
1	3	B210-40CN	0.9 [8.8]	φ38	32×32	98.5	80.9	42	—	B23-40C P.2-073~	—	—	—	B43-38N P.2-171~
2		B210-60CN	2.7 [26.4]	φ60	50×50	102.5	97.9	47	—	B23-60C P.2-073~	—	—	—	B43-60N P.2-171~
3		B210-80CN	3.5 [34.3]	φ85	70×70	151	131.7	47	—	B23-80C P.2-075~	—	—	—	B43-85N P.2-171~
4		B210-100CN	3.5 [34.3]	φ100	90×90	152.5	151.7	42	—	B23-100C P.2-075~	—	—	—	B47-100AN P.2-173
5		B220-100CN	6.0 [58.8]	φ100	90×90	161	151.7	50	—	B27-100C P.2-077~	—	—	—	B47-100AN P.2-173
6		B230-38N	0.9 [8.8]	25×25	32×32	68.2	73.9	50	—	B21-25CN P.2-069~	—	—	—	B43-38N P.2-171~
7		B230-60N	1.0 [9.8]	40×40	50×50	98.5	91.9	47	—	B23-40C P.2-073~	—	—	—	B43-60N P.2-171~
8	4	B240-40AN	0.7 [6.8]	φ38	32×32	112.2	116.8	82	—	B23-40A P.2-073~	B33-40A P.2-082	—	—	B43-38N P.2-171~
9		B240-60AN	1.7 [16.6]	φ60	50×50	133.5	135.5	87	—	B23-60A P.2-073~	B33-60A P.2-082	—	—	B43-60N P.2-171~
10		B240-80AN	2.3 [22.5]	φ85	70×70	206.5	195.7	102	—	B23-80A P.2-075~	B33-80A P.2-083	—	—	B43-85N P.2-171~
11		B240-40CN	0.7 [6.8]	φ38	32×32	98.5	95.8	82	—	B23-40C P.2-073~	B33-40A P.2-082	—	—	B43-38N P.2-171~
12		B240-60CN	1.7 [16.6]	φ60	50×50	102.5	103.3	87	—	B23-60C P.2-073~	B33-60A P.2-082	—	—	B43-60N P.2-171~
13		B240-80CN	2.3 [22.5]	φ85	70×70	151	137.7	102	—	B23-80C P.2-075~	B33-80A P.2-083	—	—	B43-85N P.2-171~
14	5	B250-40C-L	0.3 [2.9]	40×40	32×32	98.5	96	97	25	B23-40C P.2-073~	B33-40A P.2-082	B54-40U2N P.2-141~	B54-40UN P.2-141~	—
15		B250-40C-W	0.2 [1.9]	40×40	32×32	98.5	96	102	40	B23-40C P.2-073~	B33-40A P.2-082	B54-40UN P.2-141~	B54-40LN P.2-141~	—
16		B250-60C-L	0.76 [7.4]	60×60	50×50	102.5	103	107	35	B23-60C P.2-073~	B33-60A P.2-082	B54-60U2N P.2-145~	B54-60UN P.2-145~	—
17		B250-60C-W	0.9 [8.8]	60×60	50×50	102.5	103	102	60	B23-60C P.2-073~	B33-60A P.2-082	B54-60UN P.2-145~	B54-60LN P.2-145~	—
18		B270-40C-L	0.5 [4.9]	40×40	32×32	100.5	96.5	102	40	B23-40C P.2-073~	B33-40A P.2-082	B58-40UC P.2-159~	B58-40LC P.2-159~	—
19		B270-40C-W	0.5 [4.9]	40×40	32×32	100.5	96.5	102	60	B23-40C P.2-073~	B33-40A P.2-082	B58-40LC P.2-159~	B58-40WLC P.2-159~	—
20		B270-60C-L	1.4 [13.7]	60×60	50×50	113.5	109	112	50	B23-60C P.2-073~	B33-60A P.2-082	B58-60UC P.2-163~	B58-60LC P.2-163~	—
21		B270-60C-W	1.4 [13.7]	60×60	50×50	113.5	109	112	75	B23-60C P.2-073~	B33-60A P.2-082	B58-60LC P.2-163~	B58-60WLC P.2-163~	—
22	B270-60C-T	1.4 [13.7]	60×60	50×50	113.5	109	112	100	B23-60C P.2-073~	B33-60A P.2-082	B58-60WLC P.2-163~	B58-60TLC P.2-163~	—	

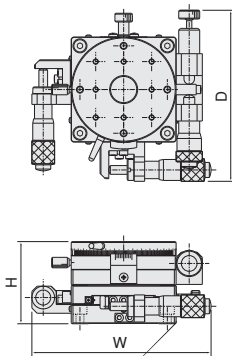
※Size might be changed due to micrometer travel range.

Please feel free to contact us

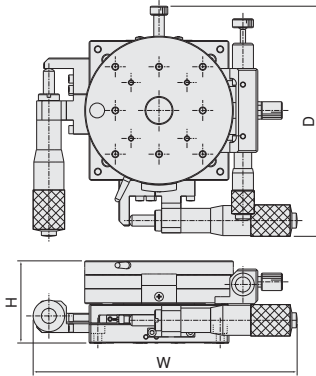
**TEL: +81-3-6711-5014    FAX: +81-3-6711-5021**  
**E-Mail: e-ost@suruga-g.co.jp**

**Dimensional outline drawings**

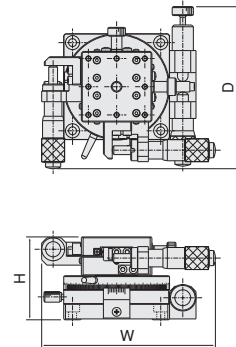
**B210 series (B210-40/60CN)**



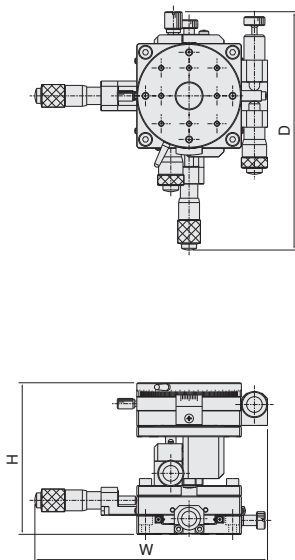
**B210,220 series (B210-80/100CN/B220-100CN)**



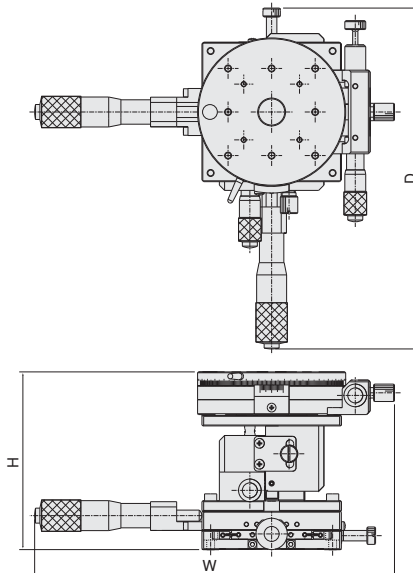
**B230 series (B230-38/60CN)**



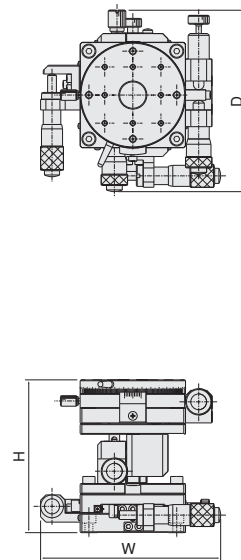
**B240 series (B240-40/60AN)**



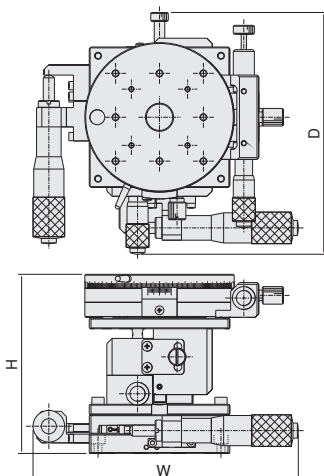
**B240 series (B240-80AN)**



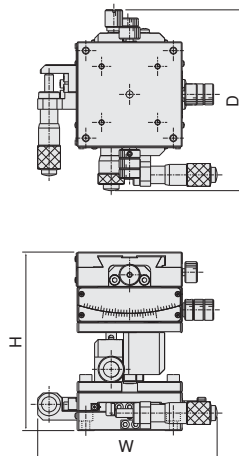
**B240 series (B240-40/60CN)**



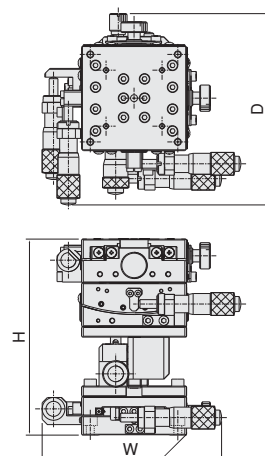
**B240 series (B240-80CN)**



**B250 series (B250-60C-□)**



**B270 series (B270-60C-□)**



X

XY

Z

Horizontal  
Z

XZ

Horizontal  
XZ

XYZ

Horizontal  
XYZ

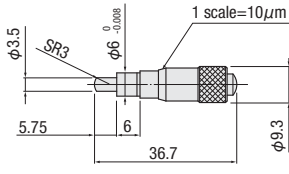
Goniometer

Rotary

Unit

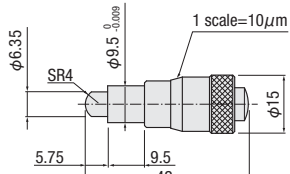
Accessories

**Micrometer head B80-1**



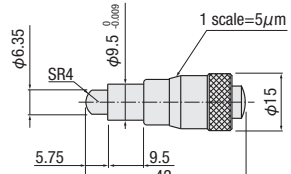
Stroke (mm)	±3.25
Minimum scale (mm)	0.01
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.01

**Micrometer head B80-2**



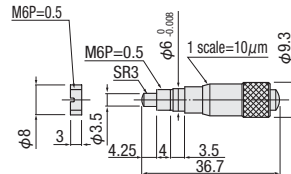
Stroke (mm)	±3.25
Minimum scale (mm)	0.01
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.03

**Micrometer head B80-3**



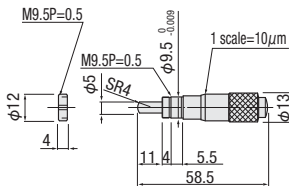
Stroke (mm)	±3.25
Minimum scale (mm)	0.005
Screw pitch (mm/1 rotation)	0.25
Weight (kg)	0.03

**Micrometer head B80-4**



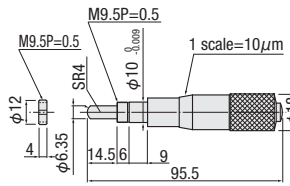
Stroke (mm)	±3.25
Minimum scale (mm)	0.01
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.01

**Micrometer head B81-2**



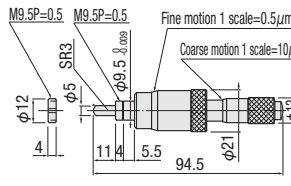
Stroke (mm)	±6.5
Minimum scale (mm)	0.01
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.03

**Micrometer head B82-1**



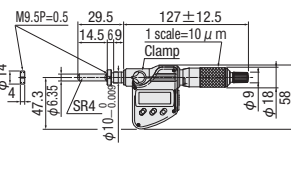
Stroke (mm)	±12.5
Minimum scale (mm)	0.01
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.09

**Coarse-fine micrometer B83-1**



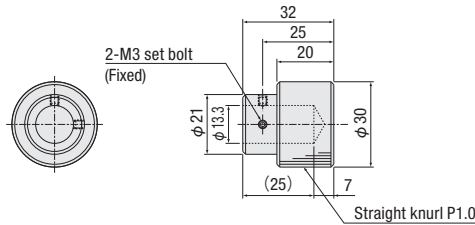
Stroke	Rough (mm)	±6.5
	micromotion (mm)	0.2
Minimum scale	Rough (mm)	0.01
	micromotion (mm)	0.0005
Screw pitch (mm/1 rotation)		0.5
Weight (kg)		0.1

**Degimatic micrometer B84-1**



Stroke (mm)	0~25
Minimum (mm)	0.001
Micrometer scale (mm)	0.01
Difference (µm)	±2
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.235

**Micrometer knob B90-1**



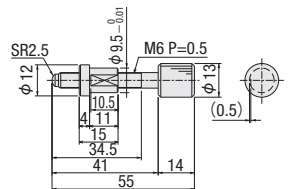
Attachable on  $\phi 13\text{mm}$  micrometer. Made by resin.  
Improvement operation depending on mounting 30mm micrometer. It can be supported long time operation.

# Feeding Screw

CAD

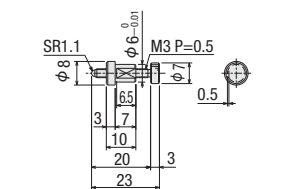
RoHS

**Feeding screw B85-1**



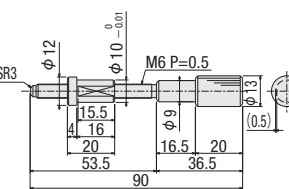
Stroke (mm)	±6.5
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.03

**Feeding screw B85-2**



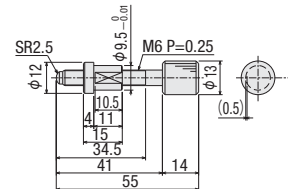
Stroke (mm)	±3.2
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.005

**Feeding screw B85-3**



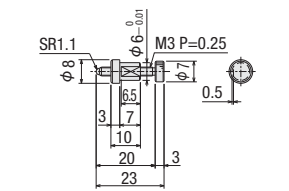
Stroke (mm)	±12.5
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.05

**Feeding screw (Fine pitch) B86-1**



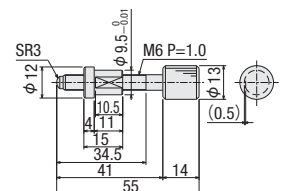
Stroke (mm)	±6.5
Screw pitch (mm/1 rotation)	0.25
Weight (kg)	0.03

**Feeding screw (Fine pitch) B86-2**



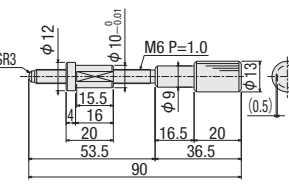
Stroke (mm)	±3.2
Screw pitch (mm/1 rotation)	0.25
Weight (kg)	0.005

**Feeding screw (Long pitch) B87-1**



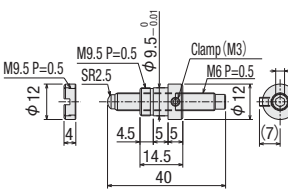
Stroke (mm)	±6.5
Screw pitch (mm/1 rotation)	1.0
Weight (kg)	0.03

**Feeding screw (Long pitch) B87-3**



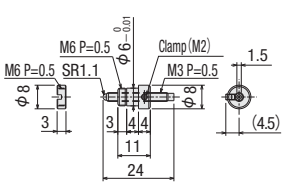
Stroke (mm)	±12.5
Screw pitch (mm/1 rotation)	1.0
Weight (kg)	0.05

**Feeding screw (Handled by hex wrench) B88-1**



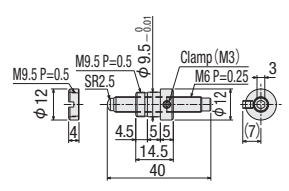
Stroke (mm)	±6.5
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.015

**Feeding screw (Handled by hex wrench) B88-2**



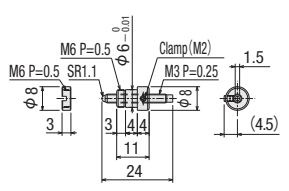
Stroke (mm)	±3.2
Screw pitch (mm/1 rotation)	0.5
Weight (kg)	0.005

**Feeding screw (Fine pitch: Handled by hex wrench) B89-1**



Stroke (mm)	±6.5
Screw pitch (mm/1 rotation)	0.25
Weight (kg)	0.015

**Feeding screw (Fine pitch: Handled by hex wrench) B89-2**



Stroke (mm)	±3.2
Screw pitch (mm/1 rotation)	0.25
Weight (kg)	0.005

Accessories

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

Unit

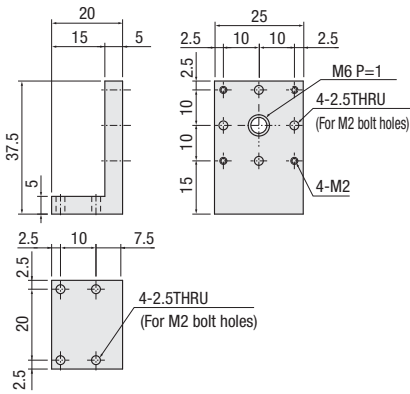
Accessories

## Z-axis Bracket

**Z-axis Bracket A47-1N**



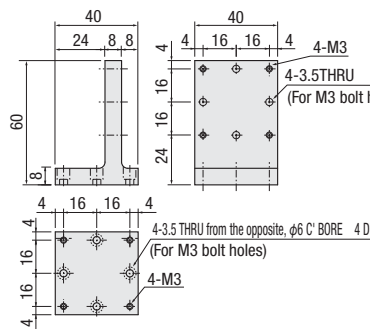
Z-axis bracket for □25mm stage.



**Z-axis Bracket A47-2**



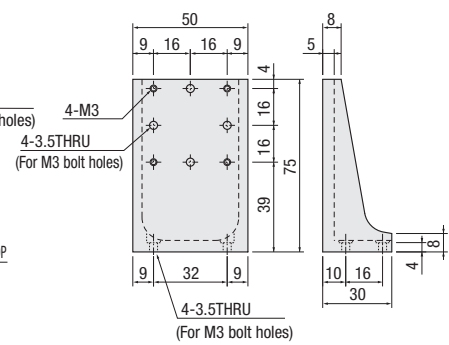
Z-axis bracket for □40mm linear stage. Attachable each bracket surface.



**Z-axis Bracket A47-4**



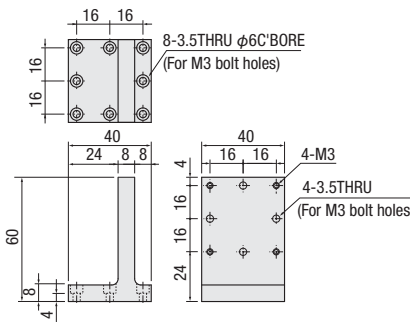
Z-axis bracket for □40mm linear stage.



**Z-axis Bracket A47-106**



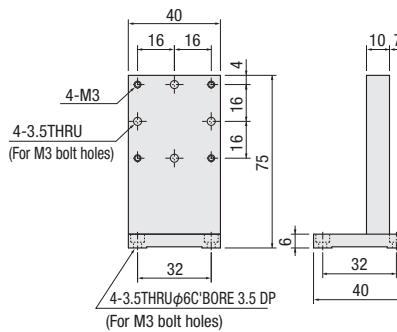
Z-axis bracket for □40mm stage.



**Stainless Z-axis Bracket AS47-2**



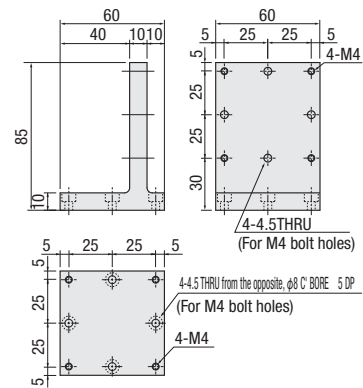
Z-axis bracket for □40mm linear stage. Attachable each bracket surface.



**Z-axis Bracket A47-3**



Z-axis bracket for □60mm linear stage. Attachable each bracket surface.



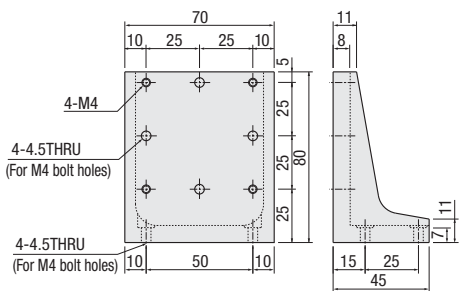
### SPEC

Model	A47-1N	A47-2	A47-4	A47-106	AS47-2	A47-3
Main material—Surface finishing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Stainless	Aluminum—Black alumite processing
Weight	0.02kg	0.07kg	0.08kg	0.07kg	0.3kg	0.2kg
Provided screws (Hex socket screws)	4 of M2—8	4 of M3—8	4 of M3—8	4 of M3—8	4 of M3—6	4 of M4—10

**Z-axis Bracket A47-5**



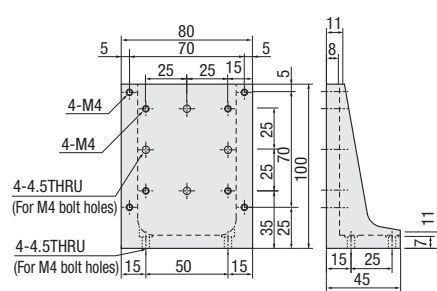
Z-axis bracket for □60mm linear stage.



**Z-axis Bracket A47-6/ASS80Z-1**



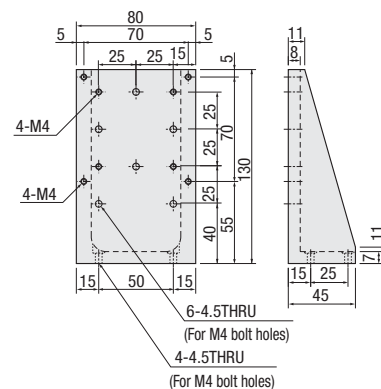
For □80mm stage.  
A47-6: BSB16/For B11-80  
ASS80Z-1: For BSS16-80



**Z-axis Bracket A47-7**



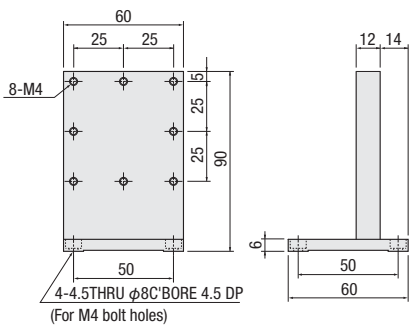
It becomes Z-axis stage using □80mm side pushing, coarse motion micrometer and long stroke type (B12-60A,B),



**Stainless Z-axis Bracket AS47-3**



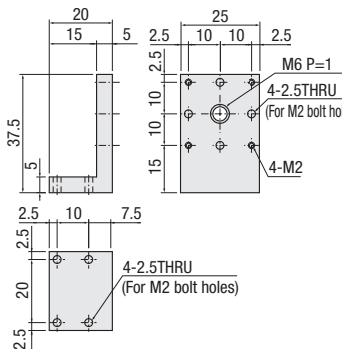
Z-axis bracket for □60mm linear stage. Attachable each bracket surface.



**Z-axis Bracket ASS25Z-1/ASB25Z-1**



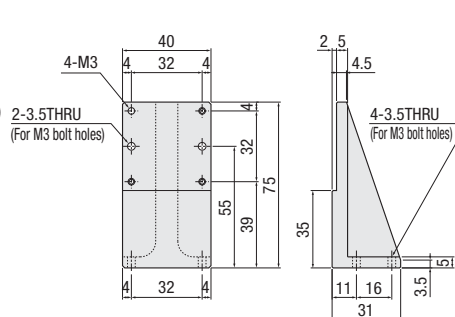
For SS stage □25mm  
ASS25Z-1: For BSS16-25  
ASB25Z-1: For BSB16-25



**Z-axis Bracket ASS40Z-1/ASB40Z-1**



For □40mm linear stage  
ASS40Z-1: For BSS16-40  
For PG413  
ASB40Z-1: For BSB16-40



**SPEC**

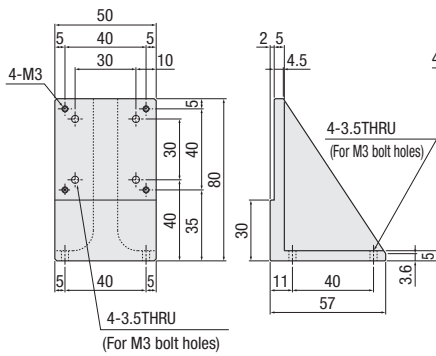
Model	A47-5	A47-6	ASS80Z-1	A47-7	AS47-3	ASS25Z-1	ASB25Z-1	ASS40Z-1	ASB40Z-1
Main material—Surface finishing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—White alumite processing	Aluminum—Black alumite processing	Stainless	Aluminum—White alumite processing	Aluminum—Black alumite processing	Aluminum—White alumite processing	Aluminum—Black alumite processing
Weight	0.19kg	0.29kg	0.29kg	0.41kg	0.5kg	0.02kg	0.02kg	0.1kg	0.1kg
Provided screws (Hex socket screws)	4 of M4—12	4 of M4—12	4 of M4—12	4 of M4—12	4 of M4—6	4 of M2—8	4 of M2—8	4 of M3—10	4 of M3—10

## Z-axis Bracket

**Z-axis Bracket  
ASS50Z-1**



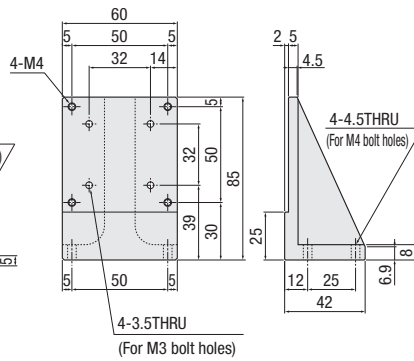
For □50mm linear stage  
ASS50Z-1: For BSS16-50  
For PG513 series



**Z-axis Bracket  
ASS60Z-1/ASB60Z-1**



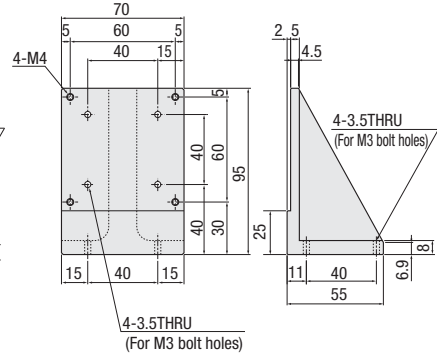
For □60mm linear stage  
ASS60Z-1: For BSS16-60  
For PG615 series  
ASB60Z-1: For BSB16-60



**Z-axis Bracket  
ASS70Z-1**



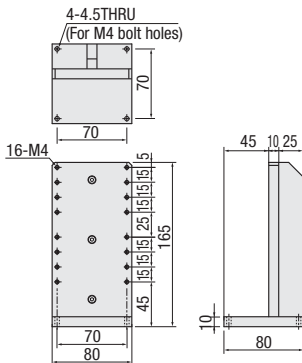
For □70mm linear stage  
ASS70Z-1: For BSS16-70  
For PG715 series



**Z-axis Bracket  
A47-101**



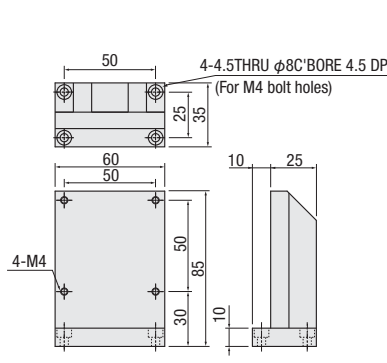
Z-axis bracket for motorized stage. Compatible stage  
KS102-30, KS102-70.



**Z-axis Bracket  
A47-112**



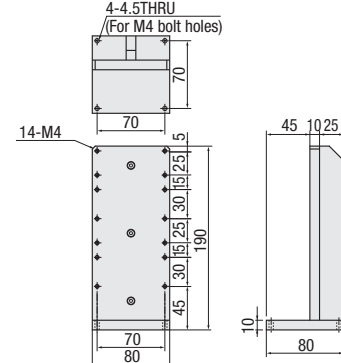
Z-axis bracket for motorized stage KXC06020/KS101-30  
series.



**Z-axis Bracket  
A47-105**



Z-axis bracket for motorized stage. Compatible stage  
KS102-100



### SPEC

Model	ASS50Z-1	ASS60Z-1	ASB60Z-1	ASS70Z-1	A47-101	A47-112	A47-105
Material—Surface finishing	Aluminum—White alumite processing	Aluminum—White alumite processing	Aluminum—Black alumite processing	Aluminum—White alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing
Weight	0.2kg	0.2kg	0.2kg	0.3kg	0.6kg	0.22kg	0.67kg
Provided screws (Hex socket screws)	4 of M3—10	4 of M4—12	4 of M4—12	4 of M3—12	4 of M4—16	4 of M4—12	4 of M4—16

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

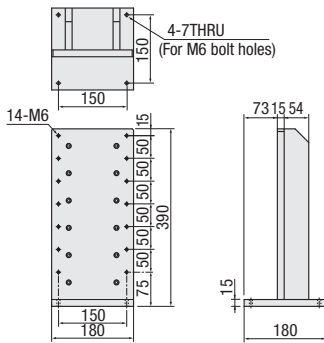
Unit

Accessories

**Z-axis Bracket  
AZTB180A-390**



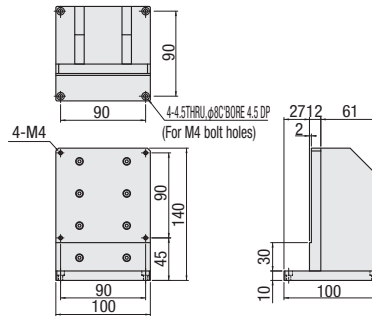
Z-axis bracket for motorized stage. Compatible stage KXS18100, KXS18200 and KXS18300



**Z-axis Bracket  
A47-1040**



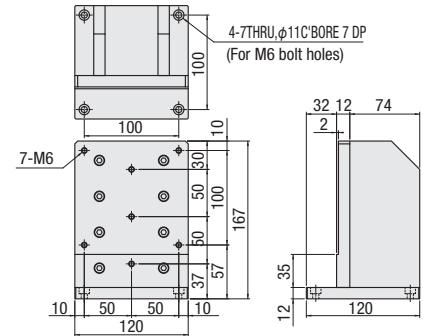
Z-axis bracket for motorized stage. Compatible stage KX1040



**Z-axis Bracket  
A47-1250**



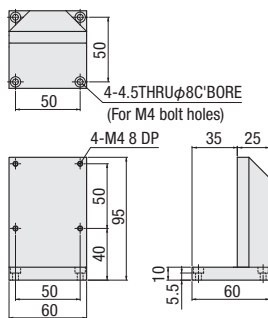
Z-axis bracket for motorized stage. Compatible stage KX1250



**Z-axis Bracket  
AZTW60A-95**



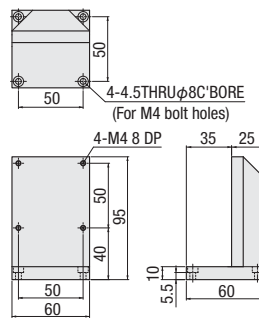
Z-axis bracket for motorized stage. Compatible stage KXG06020 and KXG06030



**Z-axis Bracket  
AZTB60A-95**



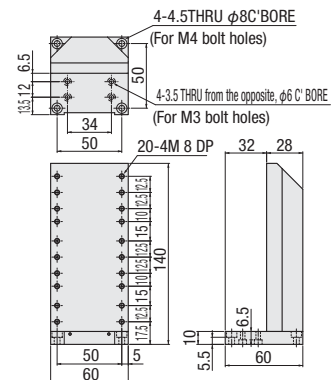
Z-axis bracket for motorized stage. Compatible stage KXC06020



**Z-axis Bracket  
AZTW60A-140**



Z-axis bracket for motorized stage. Compatible stage KXL06030, KXL06050 and KXL06075



SPEC						
Model	AZTB180A-390	A47-1040	A47-1250	AZTW60A-95	AZTB60A-95	AZTW60A-140
Material—Surface finishing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—White alumite processing	Aluminum—Black alumite processing	Aluminum—White alumite processing
Weight	5.58kg	1.04kg	1.80kg	0.36kg	0.36kg	0.72kg
Provided screws (Hex socket screws)	4 of M6—25	4 of M4—10	4 of M6—12	4 of M4—10	4 of M4—10	4 of M4—10

X

XY

Z

Horizontal Z

XZ

Horizontal XZ

XYZ

Horizontal XYZ

Goniometer

Rotary

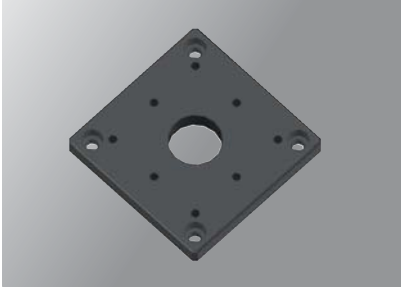
Unit

Accessories



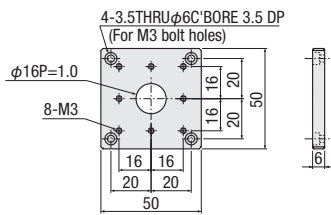
## Adaptor Plate

■ Adaptor plate  
A49-50B-1/A49-50

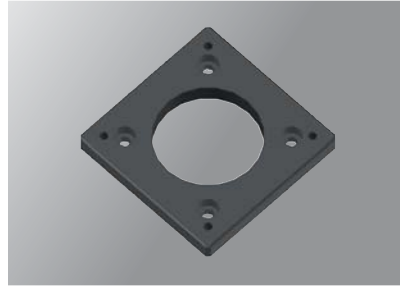


This black adaptor plate is attached 40 x 40mm stage on a 50 x 50mm stage.

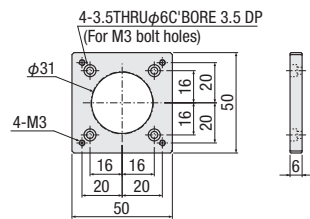
※White almite treatment for A49-50



■ Adaptor plate  
A49-50B-2



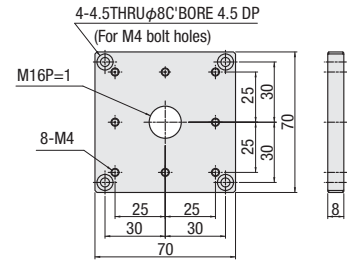
This black adaptor plate is attached 50 x 50mm stage on a 40×40 · 60×60 · φ60 · φ75mm stage.



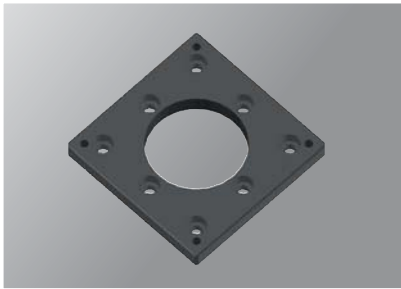
■ Adaptor plate  
A49-70



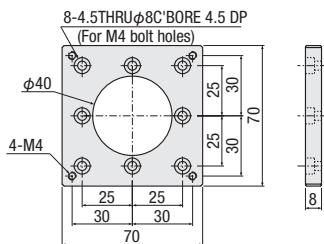
This is a white adaptor plate for attachment 70 x 70mm and 60 x 60mm stage.



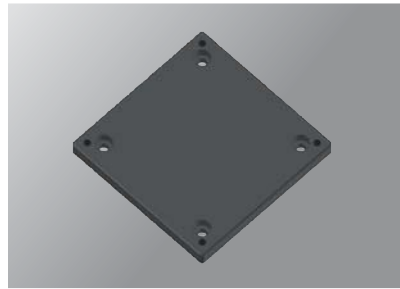
■ Adaptor plate  
A49-70B-1



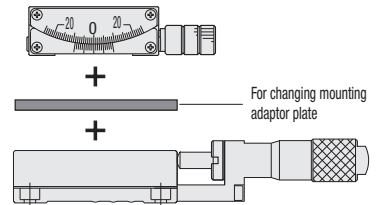
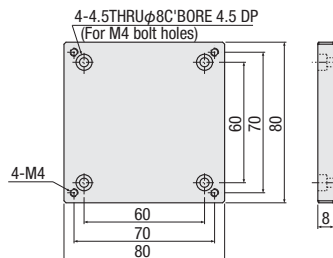
This black adaptor plate is attached 70 x 70mm stage on a 60×60 · 80×80 · 100×100mm · φ75 · φ100mm stage.



■ Adaptor plate  
A49-80



This black adaptor plate is attached 70×70mm on a 80×80mm stage and φ75mm rotation stage.

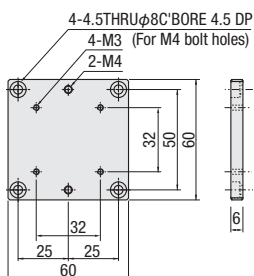


SPEC						
Model	A49-50B-1	A49-50B-2	A49-50	A49-70	A49-70B-1	A49-80
Main material—Surface finishing	Aluminum—Black almite processing	Aluminum—Black almite processing	Aluminum—White almite processing	Aluminum—White almite processing	Aluminum—Black almite processing	Aluminum—Black almite processing
Weight	0.05kg	0.05kg	0.05kg	0.11kg	0.11kg	0.13kg
Provided screws (Hex socket screws)	4 of M3—8	4 of M3—8	4 of M3—8	4 of M4—8	4 of M4—8	4 of M4—8

■ Adaptor plate  
B05-A



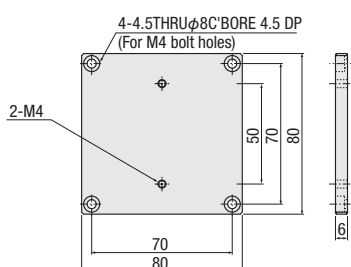
Lower plate for dovetail stage B05-11NHM, B06-11M, B05-41NM, B05-21KM



■ Adaptor plate  
B06-03A



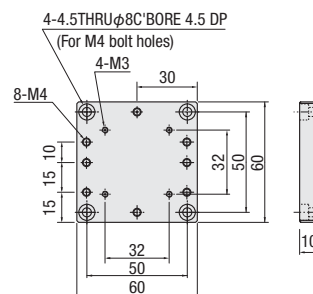
Lower plate for dovetail stage B06-11BM



■ Spacer □60 for optical axis height matching  
A49-A



Lower plate for dovetail stage B05-11BM



SPEC			
Model	B05-A	B06-03A	A49-A
Main material—Surface finishing	Aluminum—Black alumite processing	Aluminum—Black alumite processing	Aluminum—Black alumite processing
Weight	0.05kg	0.10kg	0.09kg
Provided screws (Hex socket screws)	4 of M4—6	4 of M4—6	4 of M4—10

Accessories

- X
- XY
- Z
- Horizontal Z
- XZ
- Horizontal XZ
- XYZ
- Horizontal XYZ
- Goniometer
- Rotary
- Unit
- Accessories