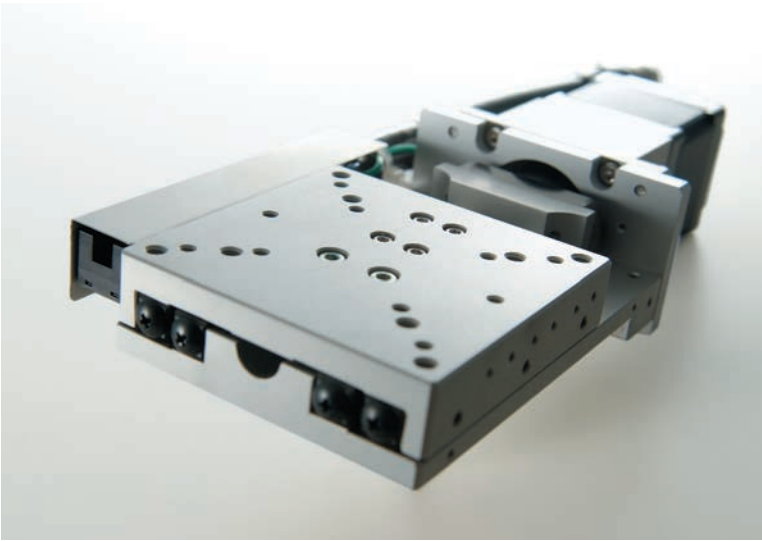


Cross Roller Guide Guidance



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.



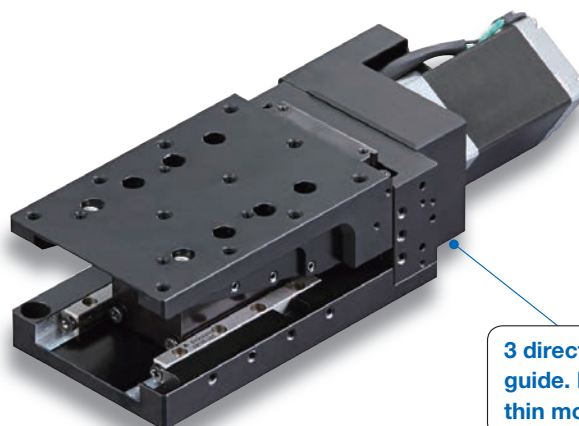
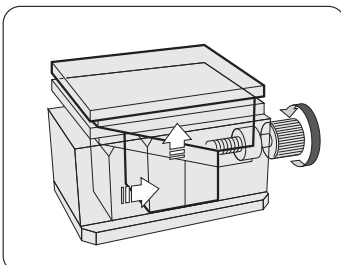
■ High precision

- ◎ 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.

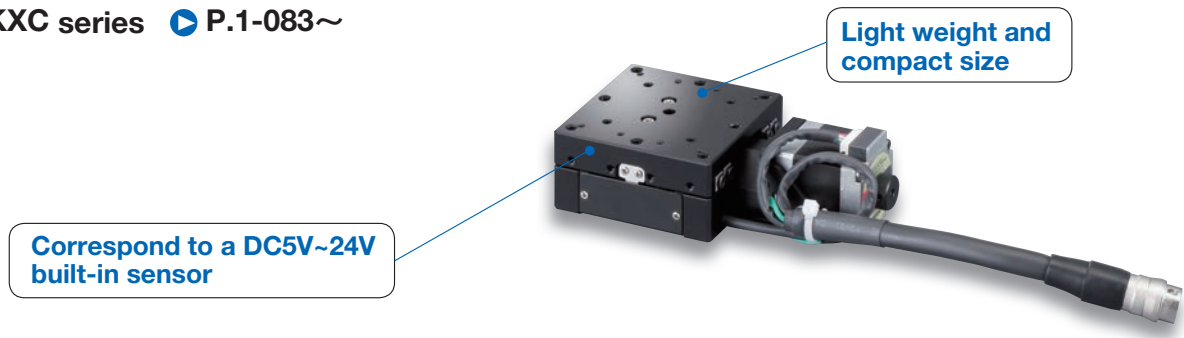
Wedge type image



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 α 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

KXC04015-C



KXC04015-PA



KXC06020-C



KXC06020-F



KXC06020-G



KXC06020-PA



See page P.009

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 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 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

ϕ 40

ϕ 50

ϕ 60

ϕ 70

ϕ 80

ϕ 100

ϕ 120

Other

SPEC

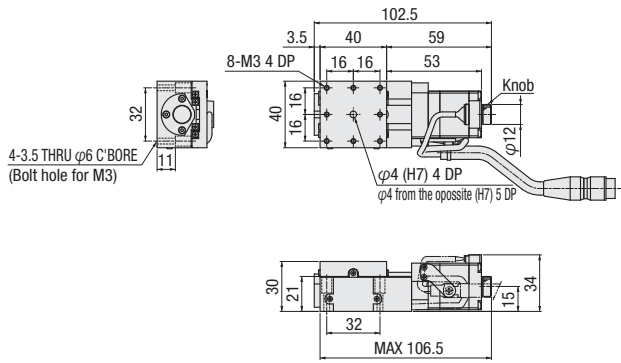
Model	KXC04015-C	KXC04015-PA	KXC06020-C	KXC06020-F	KXC06020-G	KXC06020-PA	
Travel length	15mm		20mm				
Table size	40×40mm		60×60mm				
Feed screw (Ball screw)	ϕ 6 lead 1		ϕ 8 lead 1				
Guide	Crossed roller guide						
Main materials-Finishing	Aluminum—Black almite finishing						
Weight	0.31kg	0.36kg	0.44kg	0.54kg	0.44kg	0.49kg	
Resolution (Pulse)	Full/Half	2 μ m/1 μ m	1 μ m (Set to 1000P/R)	2 μ m/1 μ m		1 μ m/0.5 μ m	1 μ m (Set to 1000P/R)
	Microstep	0.1 μ m (1/20 on resolution)	—	0.1 μ m (1/20 on resolution)		0.05 μ m (1/20 on resolution)	—
MAX speed	10mm/sec		20mm/sec				
Uni-directional positioning accuracy	Within 10 μ m		Within 5 μ m				
Repeatability positioning accuracy	Within \pm 0.5 μ m		Within \pm 0.3 μ 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 μ m						
Backlash	Within 0.5 μ m						
Straightness	Within 3 μ m						
Parallelism	Within 30 μ m						
Motion parallelism	Within 10 μ 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.

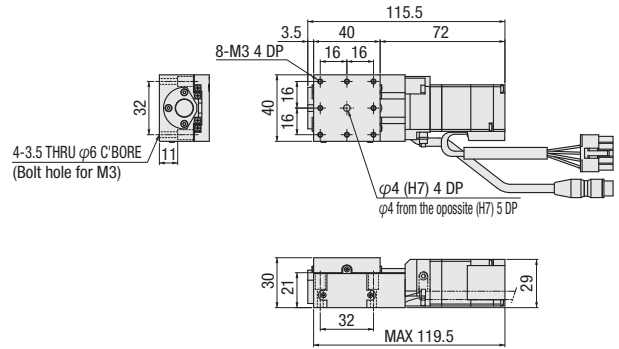
※ Motor code [PA] includes the driver, motor and sensor cable.

Dimensional outline drawings

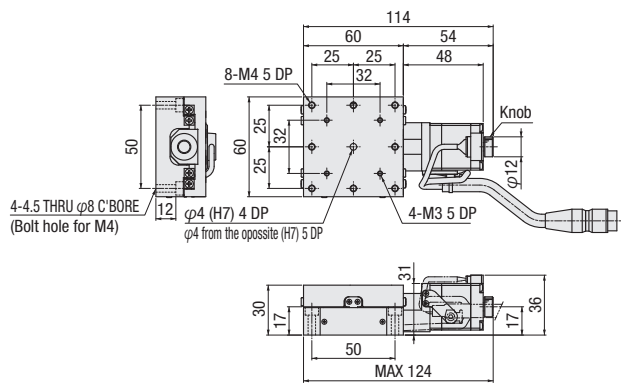
KXC04015-C



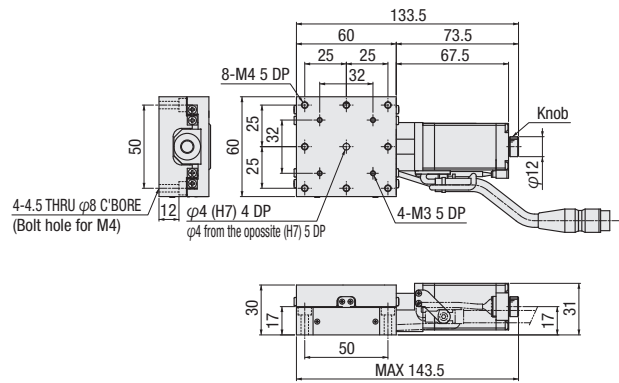
KXC04015-PA



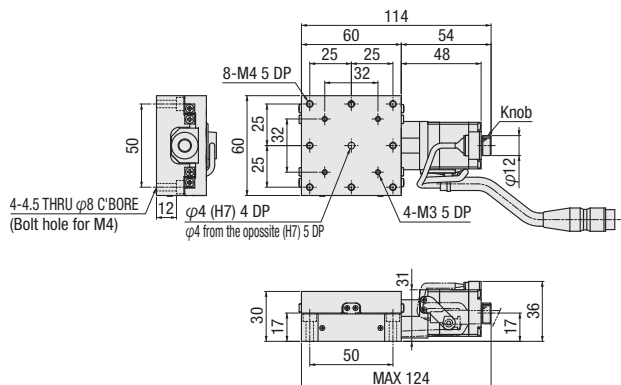
KXC06020-C



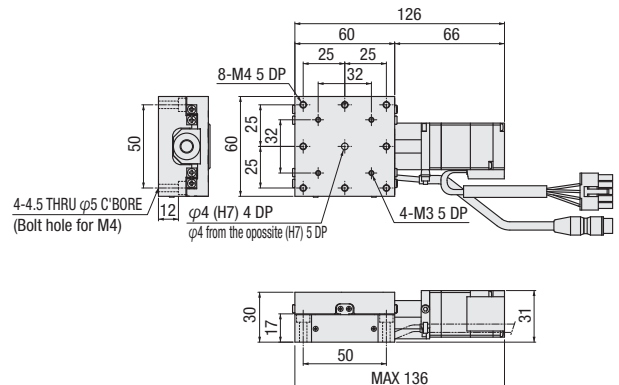
KXC06020-F



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-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

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 KYC04, 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

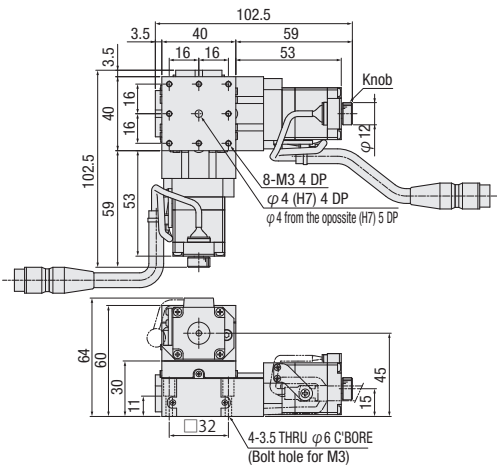
Model	KYC04015-C	KYC04015-PA	KYC06020-C	KYC06020-F	KYC06020-G	KYC06020-PA
Travel length	15mm		20mm			
Table size	40×40mm		60×60mm			
Feed screw (Ball screw)	φ6 lead 1		φ8 lead 1			
Guide	Crossed roller guide					
Main materials-Finishing	Aluminum—Black almite finishing					
Weight	0.63kg	0.73kg	0.90kg	1.10kg	0.90kg	1.00kg
Resolution (Pulse)	Full/Half	2 μm/1 μm	2 μm/1 μm		1 μm/0.5 μm	1 μm (Set to 1000P/R)
	Microstep	0.1 μm (1/20 on resolution)	—	0.1 μm (1/20 on resolution)	0.05 μm (1/20 on resolution)	—
MAX speed	10mm/sec		20mm/sec			
Load capacity	4.5kgf [44.1N]					
Perpendicularity	Within 7.5 μm/Full stroke		Within 10 μm/Full stroke			
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			
Uni-directional positioning accuracy	Within 10 μm		Within 5 μm			
Repeatability positioning accuracy	Within ±0.5 μm		Within ±0.3 μm			
Lost motion	—		Within 1 μm			
Backlash	—		Within 0.5 μm			
Straightness	—		Within 3 μm			

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

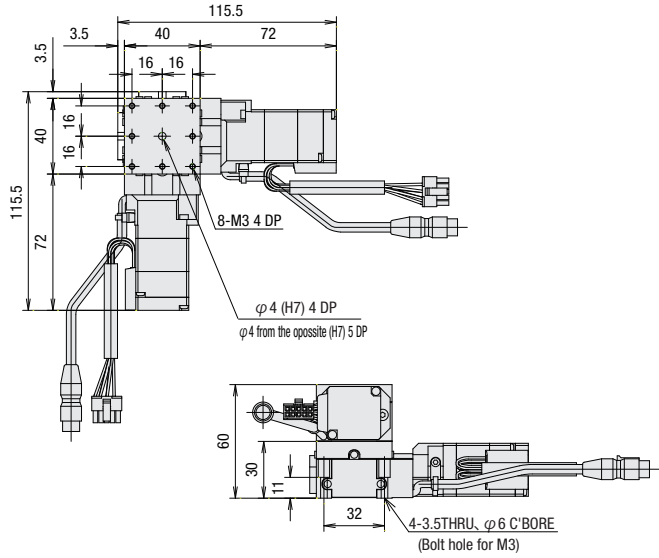
※ Motor code [PA] includes the driver, motor and sensor cable.

Dimensional outline drawings

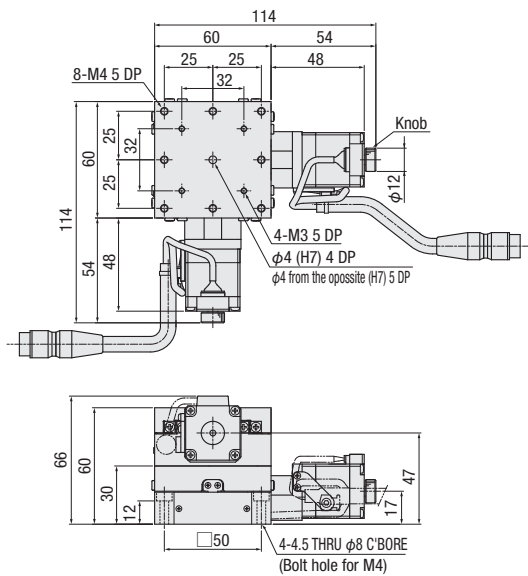
KYC04015-C



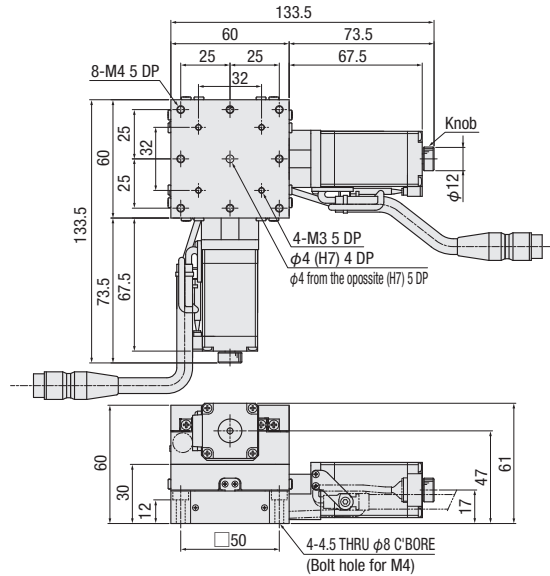
KYC04015-PA



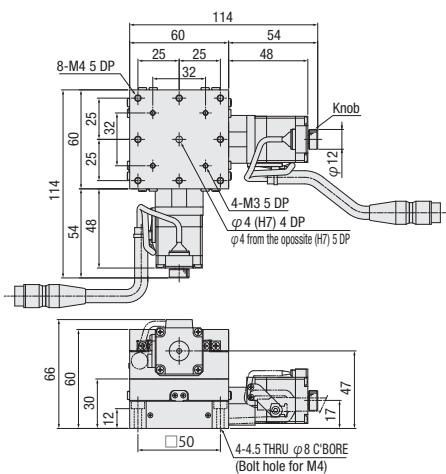
KYC06020-C



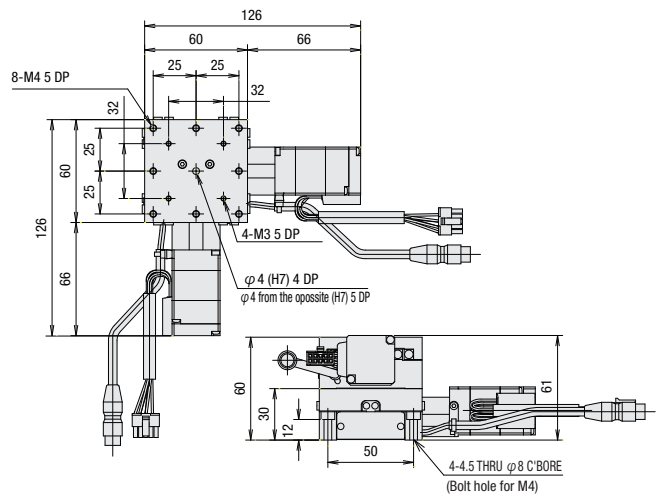
KYC06020-F



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

RoHS

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

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 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 KZC04, 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).

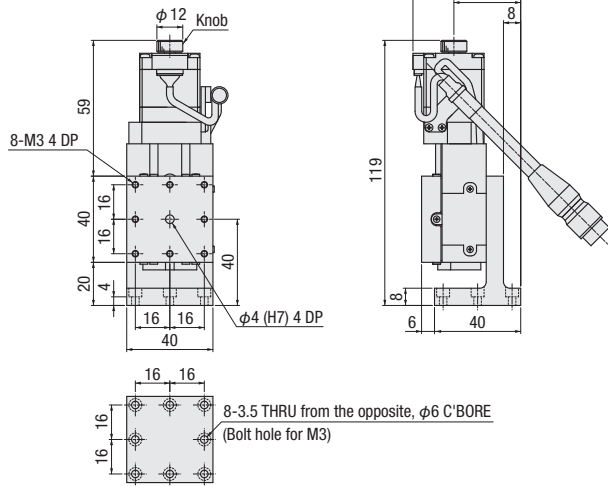
SPEC

Model		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						
Accuracy specification	Weight	0.38kg	0.43kg	0.80kg	0.90kg	0.80kg	0.85kg	
	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]						
	Vertical degree	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—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 1μm				
	Backlash	—		Within 0.5μm				
	Straightness	—		Within 3μm				

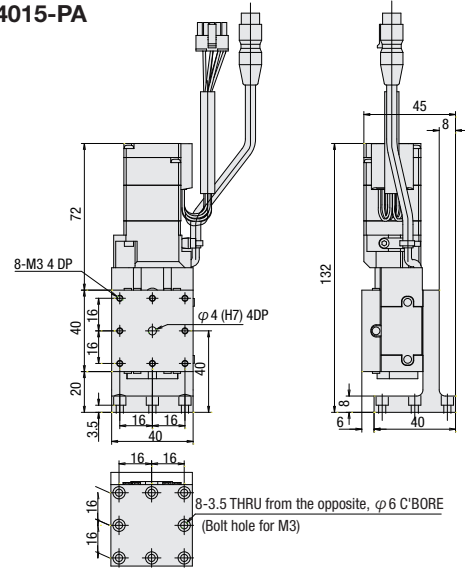
※ Motor code [C·F·G] not include the cable. Choose the cable from cable code table.
※ Motor code [PA] includes the driver, motor and sensor cable.

Dimensional outline drawings

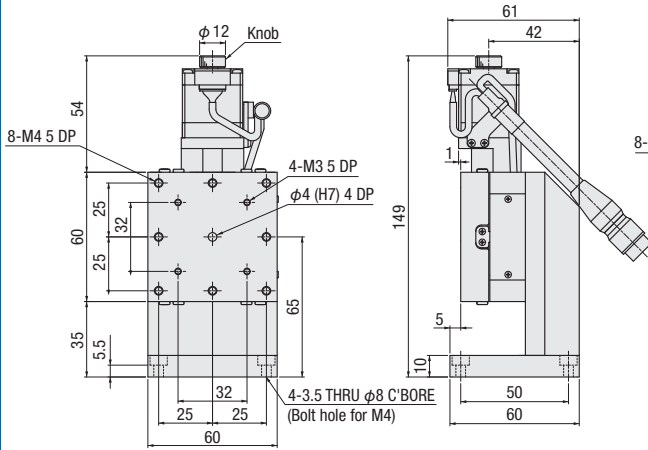
KZC04015-C



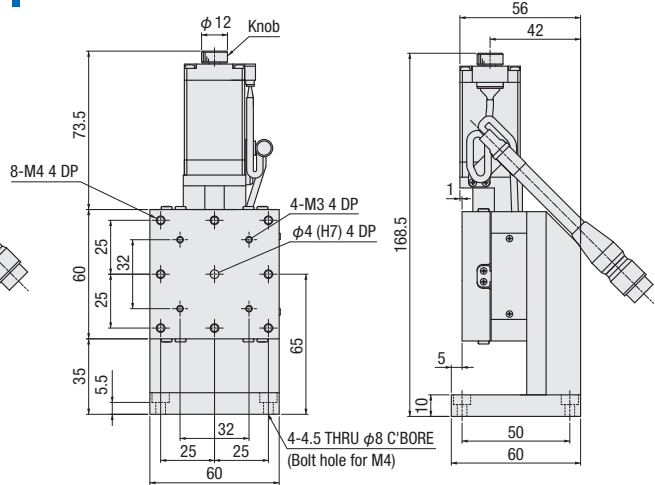
KZC04015-PA



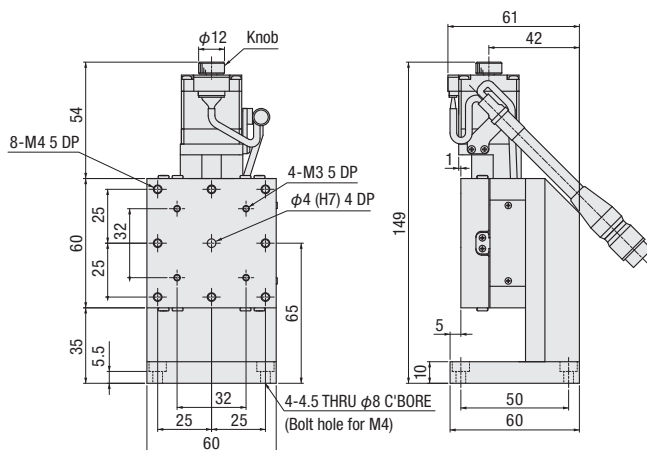
KZC06020-C



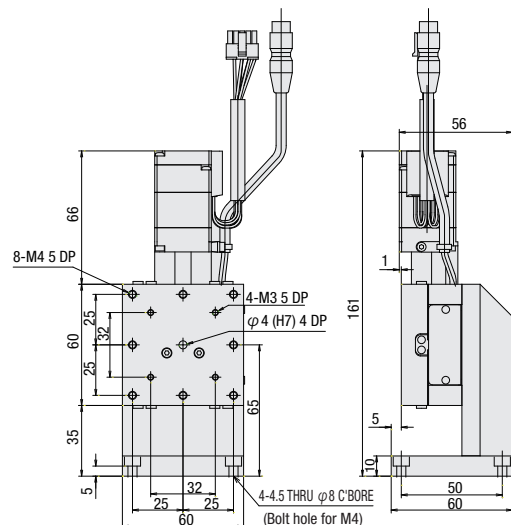
KZC06020-F



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

1

088

XYZ-axis Cross Roller Guide: KWC04015/KWC06020

KWC04015-C



KWC04015-PA



KWC06020-LC



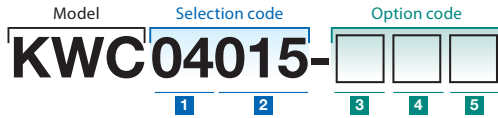
KWC06020-LF



KWC06020-LG



KWC06020-LPA



▶ 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 KWC04, 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).

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

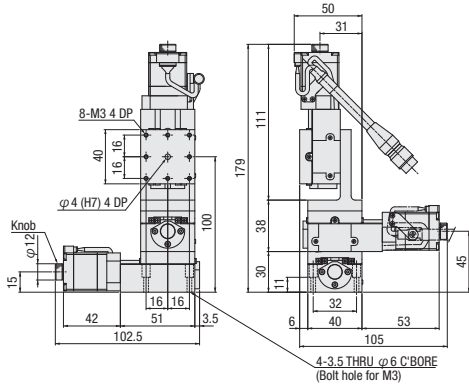
SPEC

Model	KWC04015-C	KWC04015-PA	KWC06020-LC	KWC06020-LF	KWC06020-LG	KWC06020-LPA
(Opposite hand)	-		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	2 μm/1 μm	1 μm (Set to 1000P/R)	2 μm/1 μm		1 μm/0.5 μm
	Microstep	0.1 μm (1/20 on resolution)	—	0.1 μm (1/20 on resolution)	0.05 μm (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°			
Limit sensor	Installed					
Origin sensor	Installed					
Slit origin sensor	—					
Provided screw (Hexagon-headed bolt)	4 of M3—16		4 of M4—16			
Uni-directional positioning accuracy	Within 10 μm		Within 5 μm			
Repeatability positioning accuracy	Within ±0.5 μm		Within ±0.3 μm			
Lost motion	Within 1 μm					
Backlash	Within 0.5 μm					
Straightness	Within 3 μm					

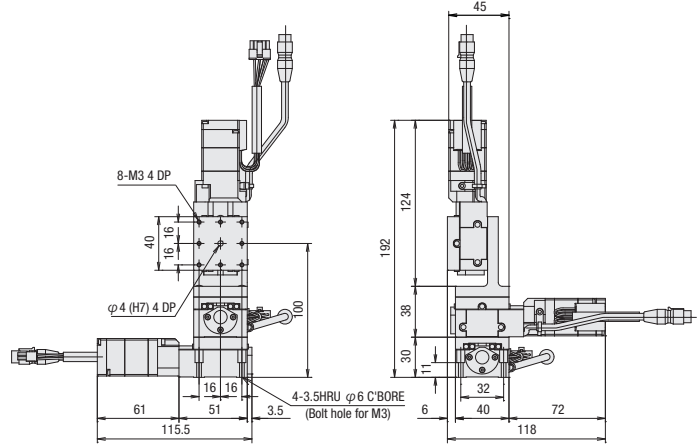
※Motor code [C·F·G] not include the cable. Choose the cable from cable code table.
※Motor code [PA] includes the driver, motor and sensor cable.

Dimensional outline drawings

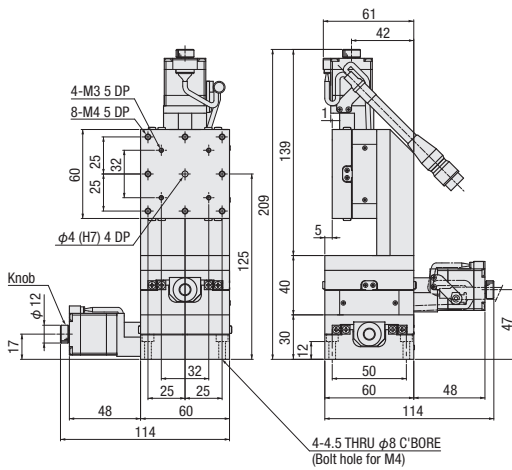
KWC04015-C



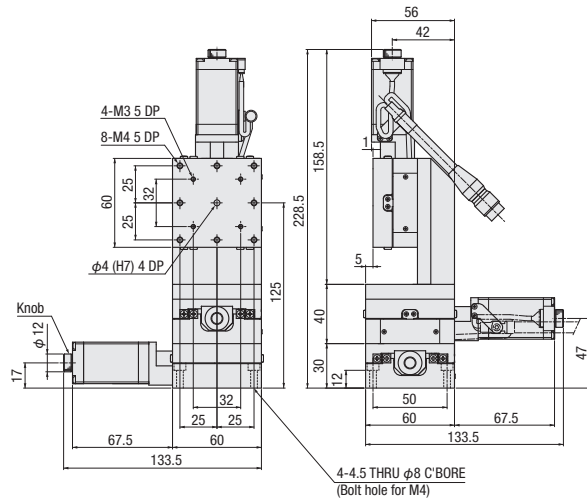
KWC04015-PA



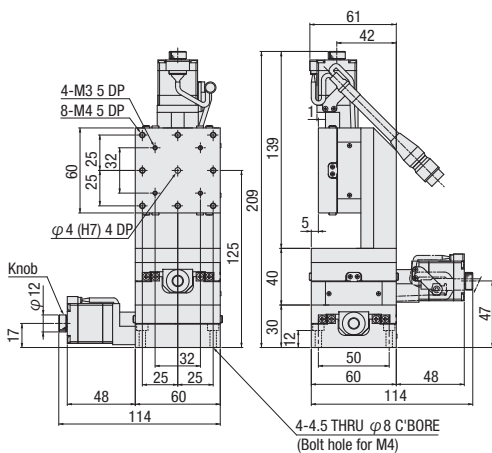
KWC06020-LC



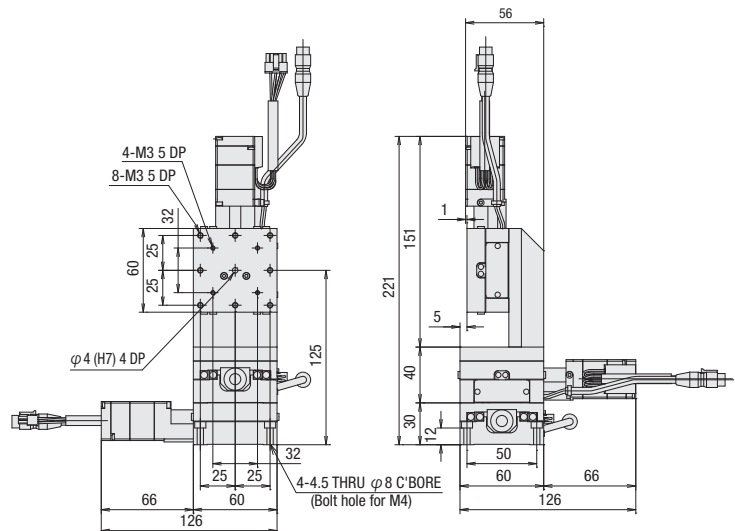
KWC06020-LF



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

$\phi 40$

$\phi 50$

$\phi 60$

$\phi 70$

$\phi 80$

$\phi 100$

$\phi 120$

Other

1

090

Electrical Specification: KXC04015/KXC06020

Electrical specification

Models		KXC04015-C	KXC06020-C	KXC06020-F	KXC06020-G	KXC04015-PA	KXC06020-PA	
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase				α 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 Compatible receiving contact	HR10A-10P-12S (73) (Hirose Electric Co.,Ltd.)				HR10A-7P-6S (73)		
Sensor	Limit sensor	Installed						
	Origin sensor	Installed						
	Slit origin sensor	-						
	Model	Photo microsensor EE-SX4320 (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 substrate K-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.

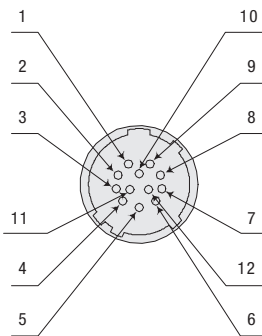
Note

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

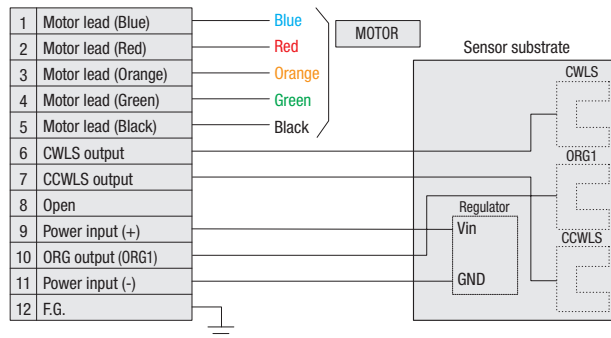
We have a variety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

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

Pin allocation (The same)

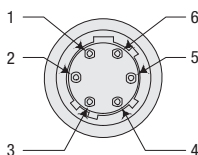


Connection diagram (The same)

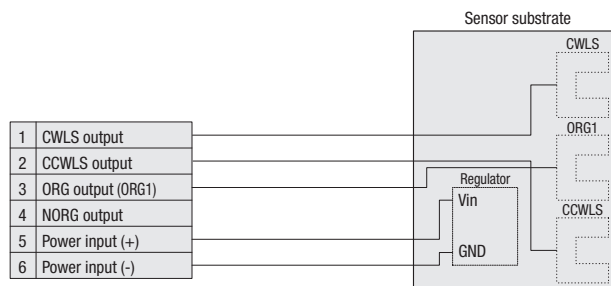


Motor code: PA (α step) Motor cable model: CC030VA2R2 ▶ P.1-211

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

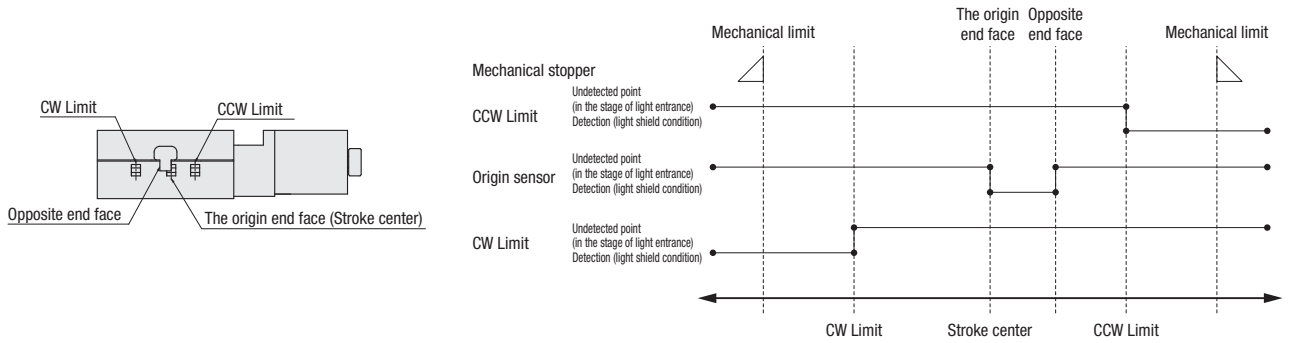
φ80

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
KXC04015	Return to origin	8.5	7.7	0	2	7.7	8.5
KXC06020	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.

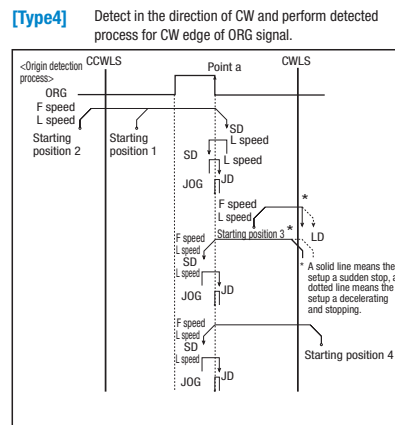
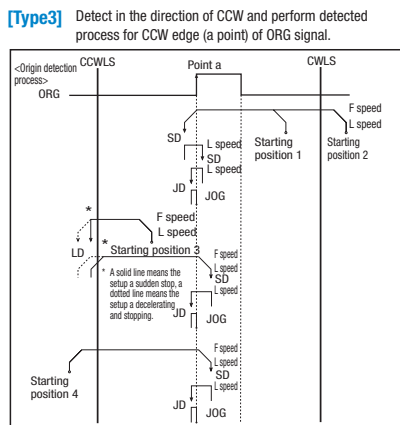
Note: The timing chart shows only timing of sensor, it is not for output signal logic.
 Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

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~

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



- 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

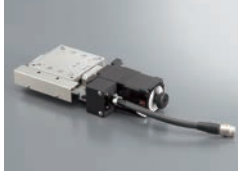
Motorized Stage

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

Motorized Stage

RoHS

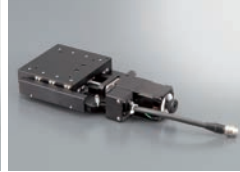
KX0725C-L



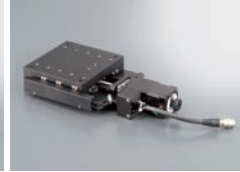
KX0830C-L



KX1040C-L



KX1250C-L



KX0725C-R



KX0830C-R



KX1040C-R



KX1250C-R



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

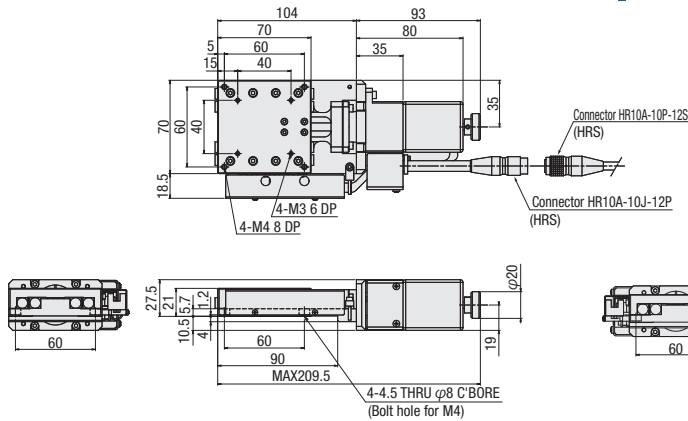
Other

SPEC

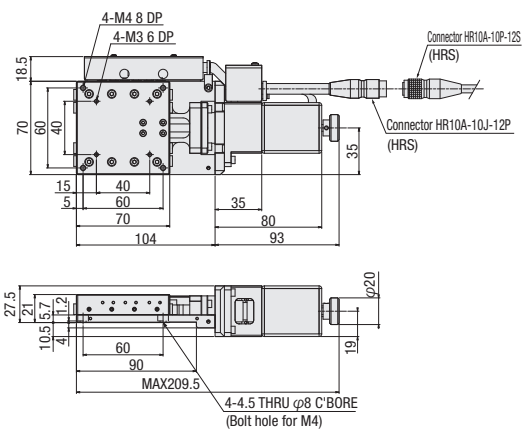
Model	KX0725C-L5	KX0830C-L5	KX1040C-L5	KX1250C-L5
(Opposite hand)	KX0725C-R5	KX0830C-R5	KX1040C-R5	KX1250C-R5
Travel length	25mm	30mm	40mm	50mm
Table size	70×70mm	80×80mm	100×100mm	120×120mm
Feed screw	Ball screwφ6 lead 1			
Guide	Crossed roller guide			
Main materials-Finishing	Aluminum—White almitine 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	

Dimensional outline drawings

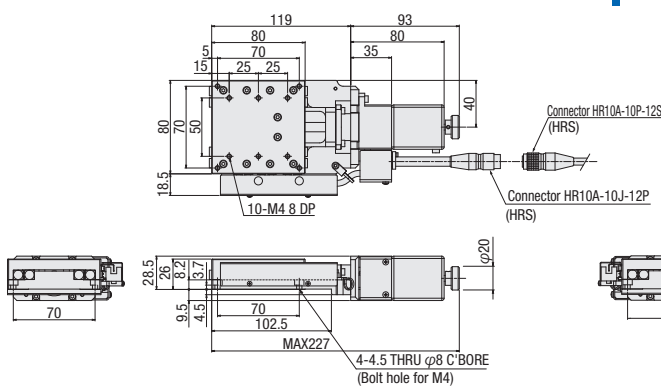
KX0725C-L



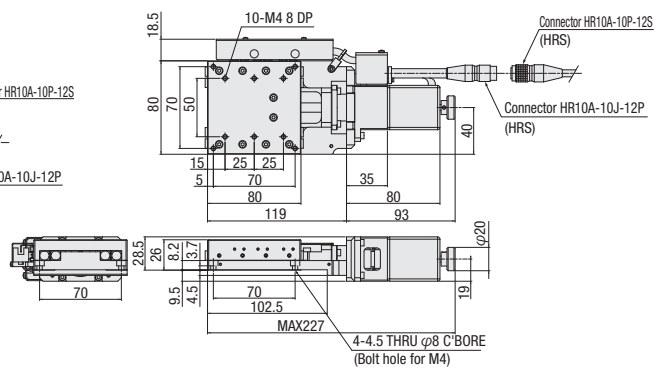
KX0725C-R



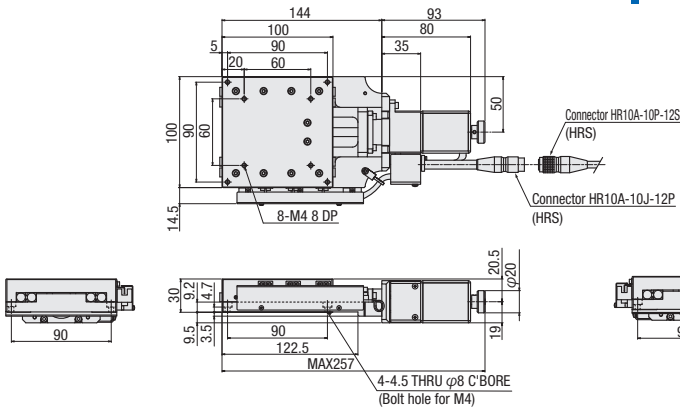
KX0830C-L



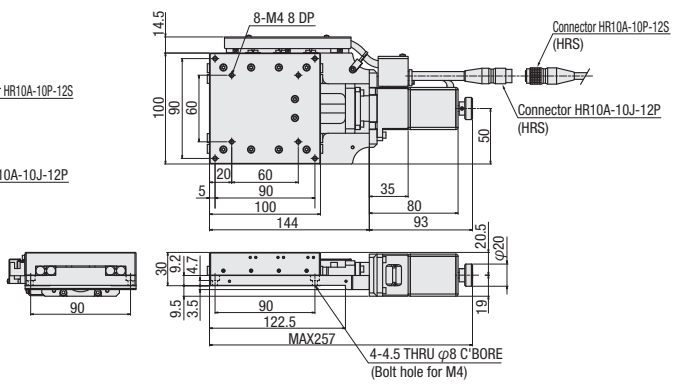
KX0830C-R



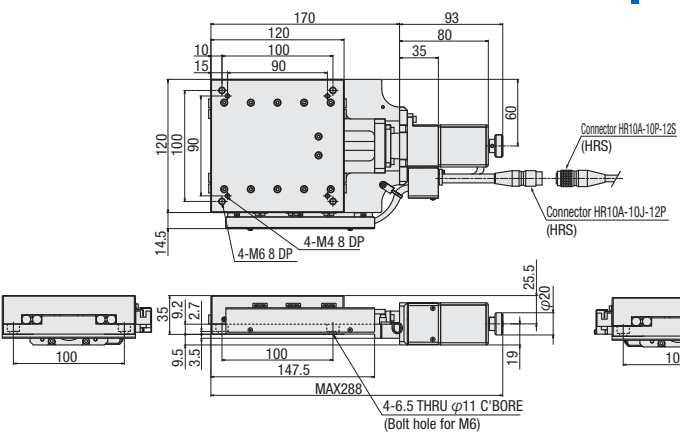
KX1040C-L



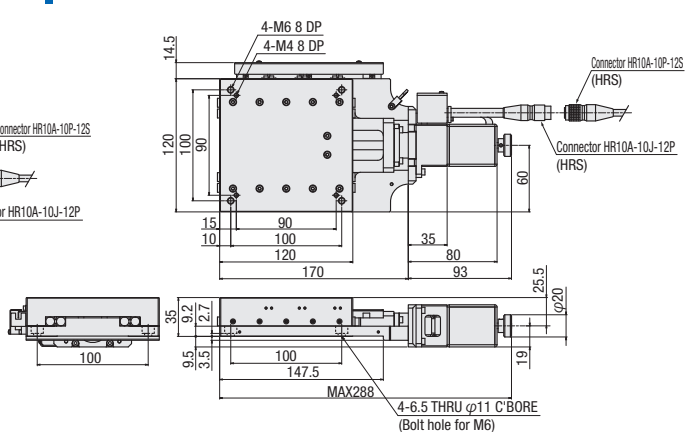
KX1040C-R



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

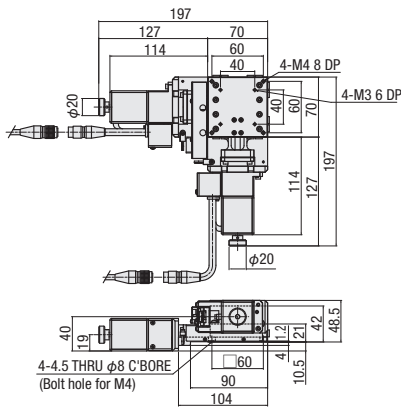
Other

1
095

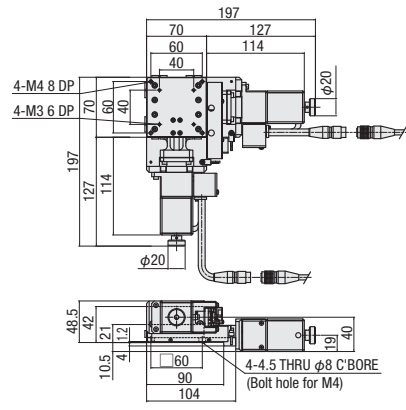
		SPEC			
Model		KY0725C-L5	KY0830C-L5	KY1040C-L5	KY1250C-L5
(Opposite hand)		KY0725C-R5	KY0830C-R5	KY1040C-R5	KY1250C-R5
Mechanical specification	Travel length	25mm	30mm	40mm	50mm
	Table size	70×70mm	80×80mm	100×100mm	120×120mm
	Feed screw	Ball screw φ6 lead 1		Ball screw φ8 lead 1	
	Guide	Crossed roller 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)	1 μm/0.5 μm			
		0.05 μm (1/20 on resolution)			
	MAX speed	10mm/sec			
	Load capacity	10kgf [98N]	15kgf [147N]	20kgf [196N]	25kgf [245N]
Perpendicularity		Within 30 μm/Full stroke			
Sensor	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
Supplied accuracy specification	Uni-directional positioning accuracy	Within 5 μm			
	Repeatability positioning accuracy	Within ±0.3 μm			
	Lost motion	Within 1 μm			
	Backlash	Within 0.5 μm			
	Straightness	Within 1 μm			
	Pitching/Yawing	Within 20" / Within 15"			

Dimensional outline drawings

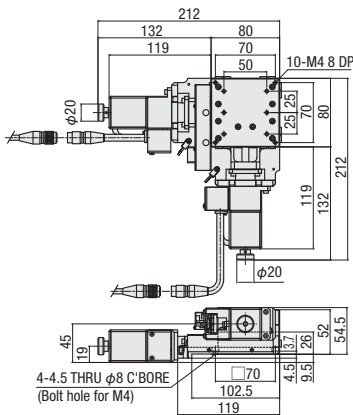
KY0725C-L



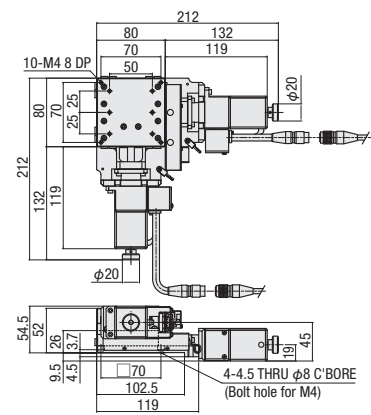
KY0725C-R



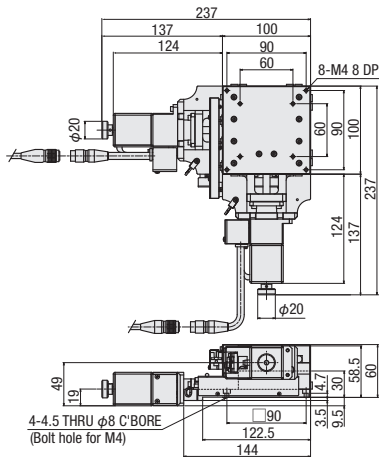
KY0830C-L



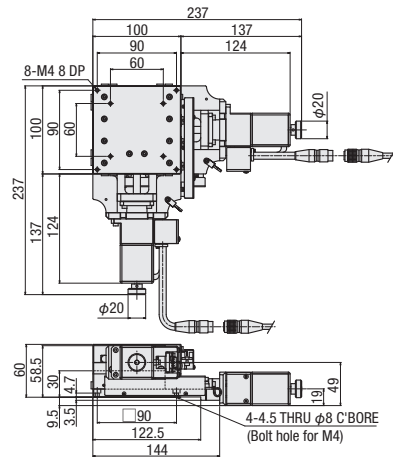
KY0830C-R



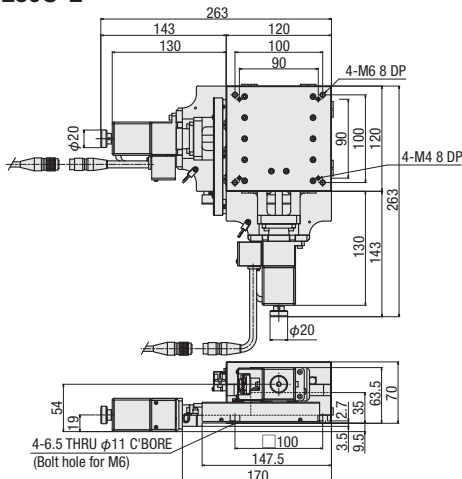
KY1040C-L



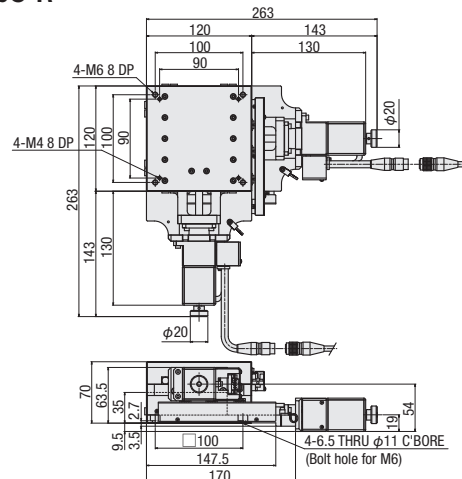
KY1040C-R



KY1250C-L



KY1250C-R



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

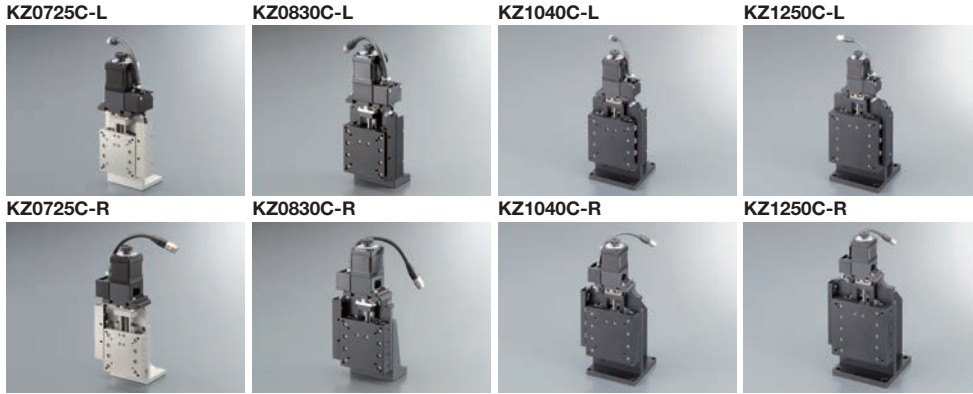
Other

Motorized Stage

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

Motorized Stage

RoHS



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

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).

- Linear Ball
- CAVE-X Linear ball

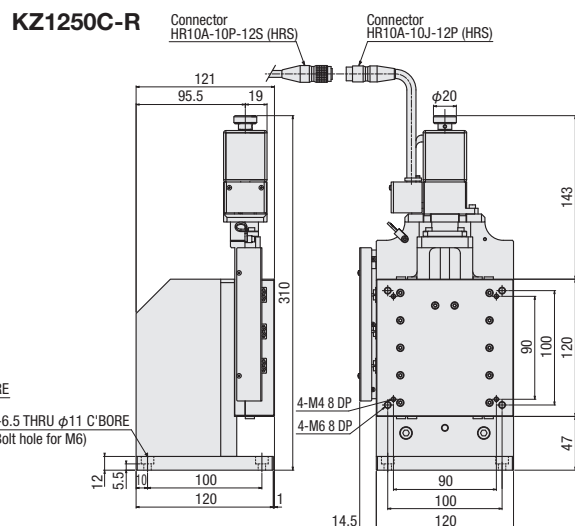
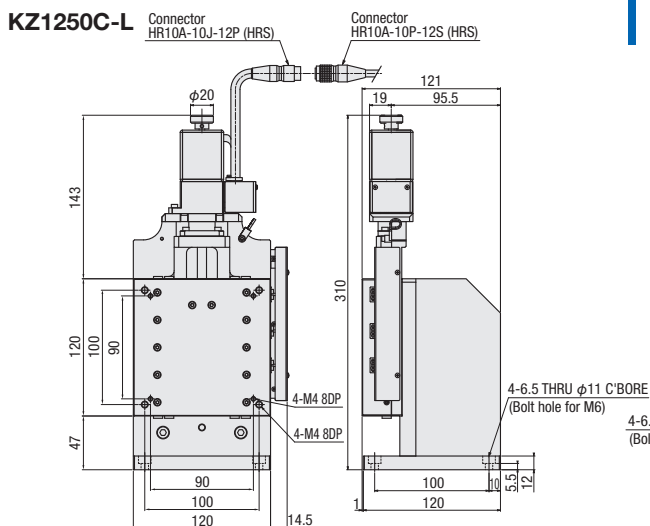
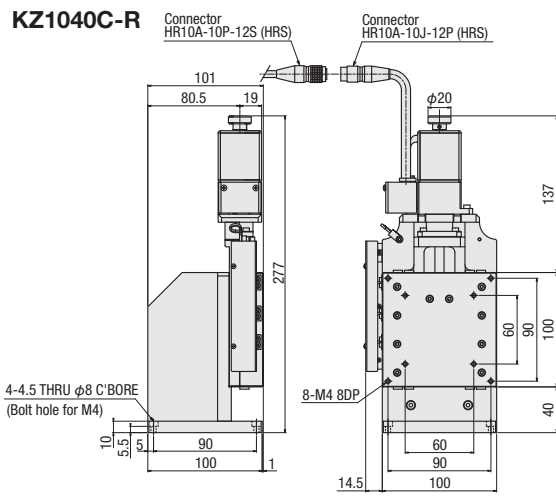
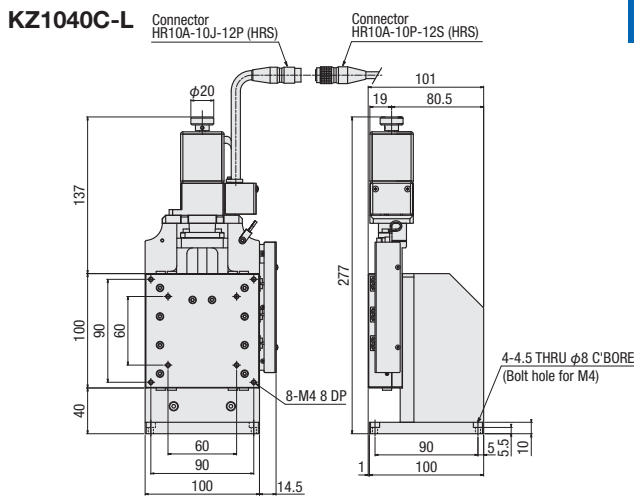
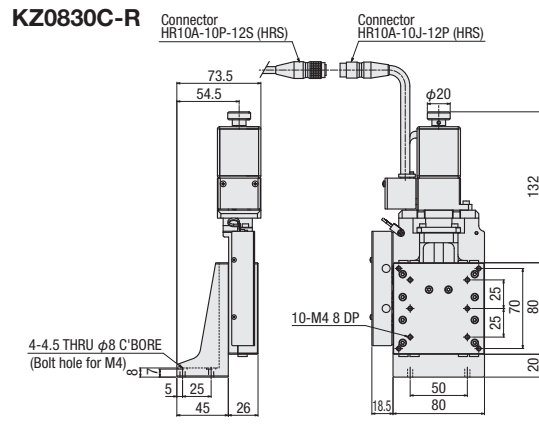
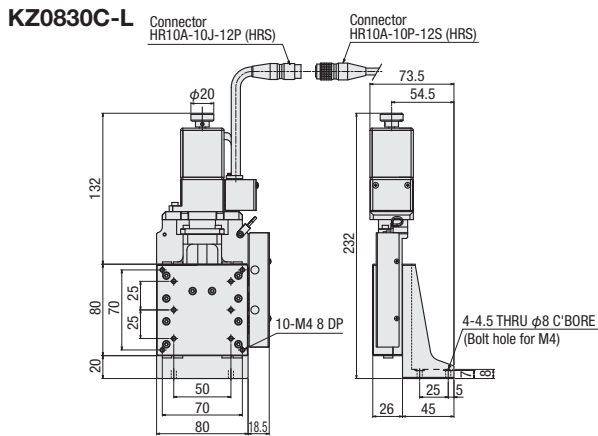
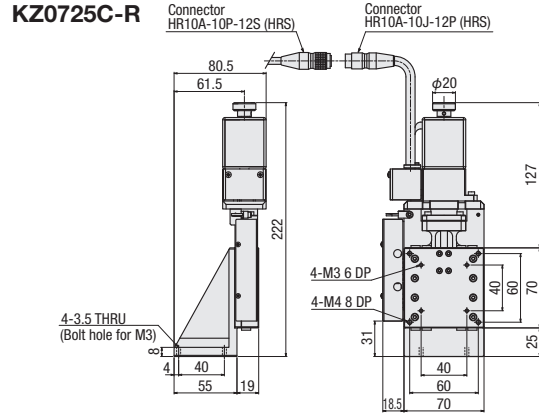
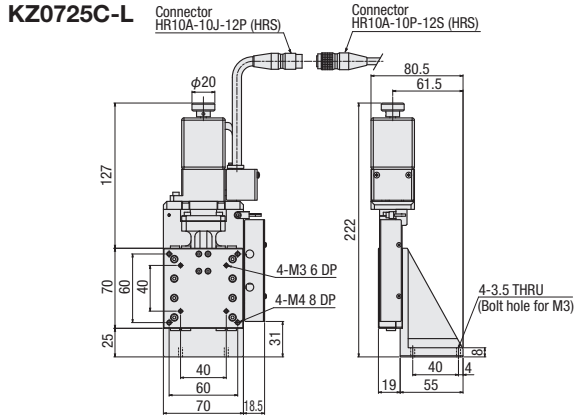
- Cross Roller

- Slide Guide

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

SPEC					
Model	KZ0725C-L5	KZ0830C-L5	KZ1040C-L5	KZ1250C-L5	
(Opposite hand)	KZ0725C-R5	KZ0830C-R5	KZ1040C-R5	KZ1250C-R5	
Mechanical specification	Travel length	25mm	30mm	40mm	
	Table size	70×70mm	80×80mm	100×100mm	
	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)	1μm/0.5μm			
		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			
Sensor	Repeatability positioning accuracy	Within ±0.3μm			
	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

Electrical Specification: KX0725C/KX0830C/KX1040C/KX1250C

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-L25 (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 2V or less when the load current is 50mA Residual voltage 1V 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.

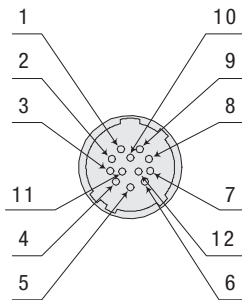
{ Output transistor ON when the detection (light entrance) (Continuity): 3=ON,4=OFF
// OFF (Non-continuity): 3=OFF,4=ON

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

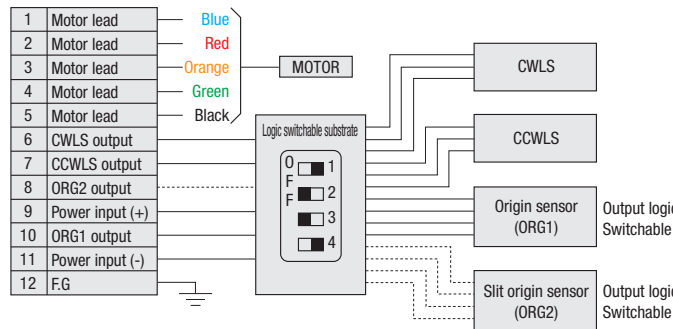
*2 Motor model is our own management model.

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

Pin allocation



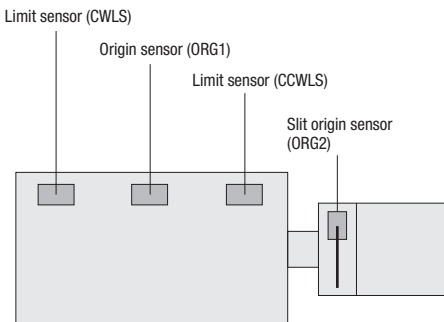
Connection diagram



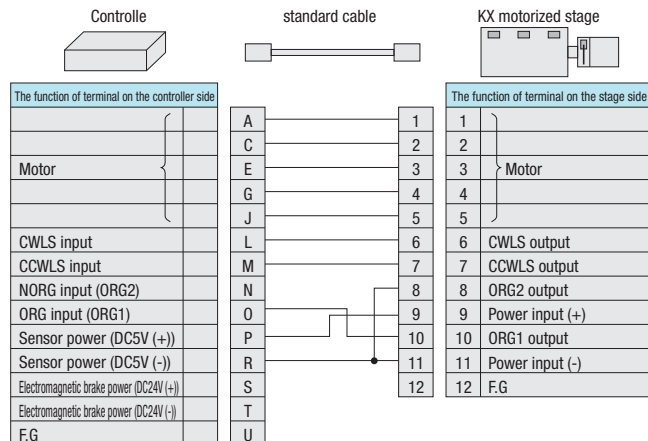
*Broken line area does not work when use standard cable

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.



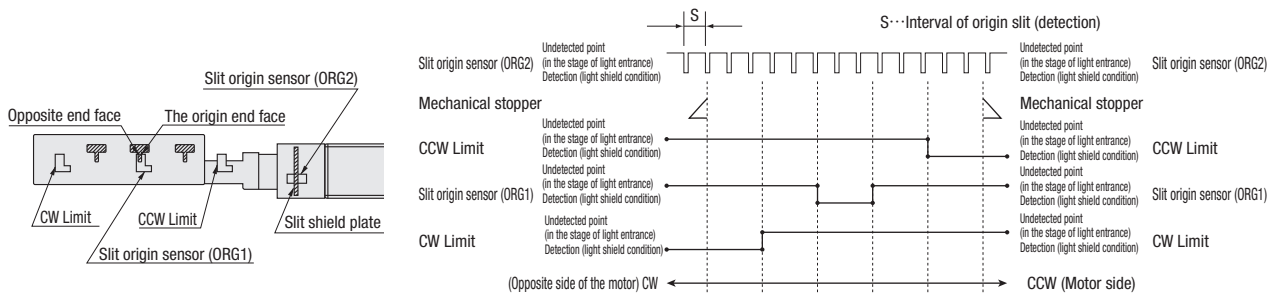
The CWLS (pin#6) and CCWLS (pin#7) on the motorized stage side are connected to CWLS (Lpin) and CCWLS (Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection, 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
KX0725C	Return to origin	15	13.3	0	2	13.3	15
KX0830C	Return to origin	17.5	15.8	0	2	15.8	17.5
KX1040C	Return to origin	22.5	20.8	0	2	20.8	22.5
KX1250C	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 incorrectly. Choose your best one whatever you need according to be recommended as below.

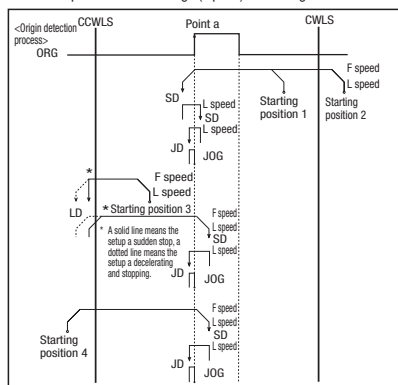
KX0725C/KX0830C/KX1040C/KX1250C recommended return to origin **Return to origin sequence P.1-201~**

- 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.

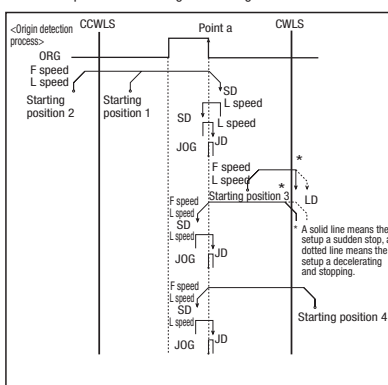
Select return to origin type from the followings when use the slit origin sensor (ORG2).

- 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.

[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



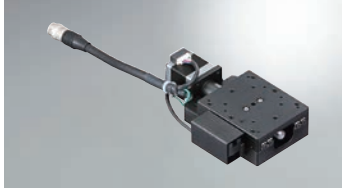
DS112/102

X-axis Cross Roller Guide: KS101-30

Motorized Stage

RoHS

KS101-30LC



KS101-30LMS



KS101-30LPA



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

1	X-axis
2 Travel	
30	30mm

3 Sensor cover location

Code	Specification
L	L position
R	Opposite hand

4 Motor option

Code	Specification
C	Standard
MS	<input type="checkbox"/> 38 Microstep
PA	<input type="checkbox"/> 28 α step
QA	<input type="checkbox"/> 42 α 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 (α step)	—
5A	5m (α step)	—
2R	Robot cable 2m (α step)	—
5R	Robot cable 5m (α 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).

		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 ϕ 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)	2 μ m / 1 μ m	1 μ m / 0.5 μ m	1 μ m (Set to 1000P/R)	
Accuracy specification	Full/Half Microstep	—	0.05 μ m (1/20 on resolution)	—	
	MAX speed	20mm/sec	10mm/sec	20mm/sec	
	Uni-directional positioning accuracy	Within 5 μ m			
	Repeatability positioning accuracy	Within \pm 0.3 μ m			
	Load capacity	5.0kgf [49N]			
	Moment stiffness	Pitch 0.15/yaw 0.08/roll 0.07 ["/N · cm]			
	Lost motion	Within 1 μ m			
	Backlash	Within 0.5 μ m			
Sensor	Straightness	Within 3 μ m			
	Parallelism	Within 30 μ m			
	Motion parallelism	Within 10 μ m			
	Pitching/Yawing	Within 25"/Within 20"			
	Limit sensor	Installed			
Origin sensor	Installed				
Slit origin sensor	—				
Provided screw (Hexagon-headed bolt)		4 of M4—16			

* The price includes a driver for α step. Motor cable sold separately. Please order from cable option 2A,5A,2R and 5R. Sensor cable attached only receiving connector. See page ▶ P.1-107~.
 * The controller for α 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

ϕ 40

ϕ 50

ϕ 60

ϕ 70

ϕ 80

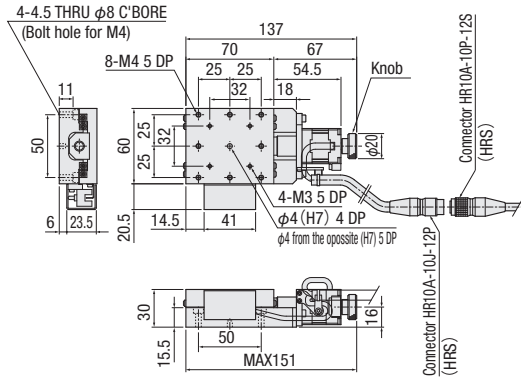
ϕ 100

ϕ 120

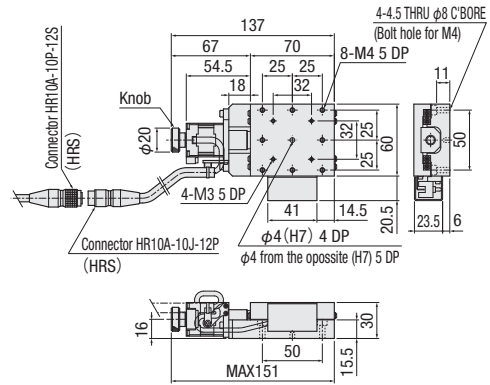
Other

Dimensional outline drawings

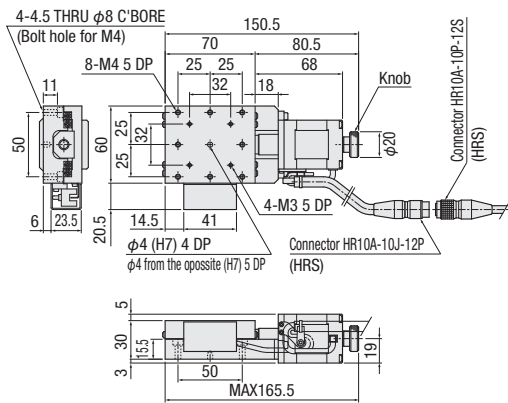
KS101-30LC



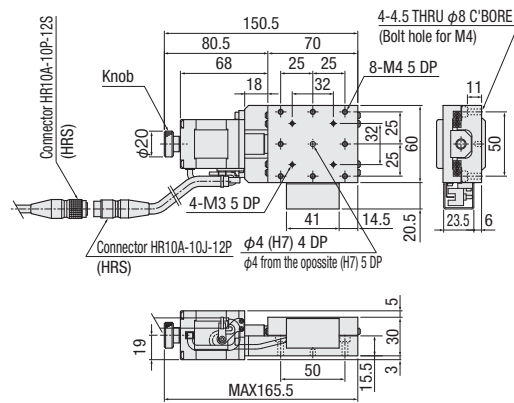
KS101-30RC



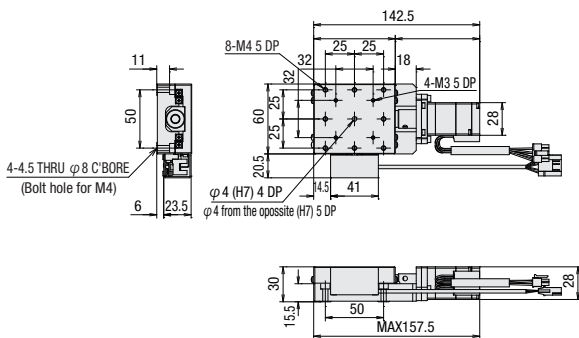
KS101-30LMS



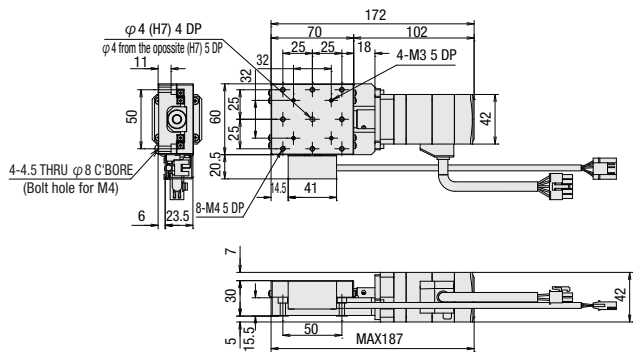
KS101-30RMS



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

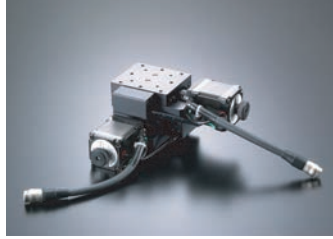
102

XY-axis Cross Roller Guide: KS201-30

KS201-30LC



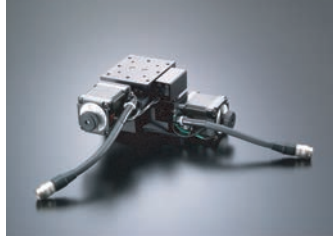
KS201-30LMS



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

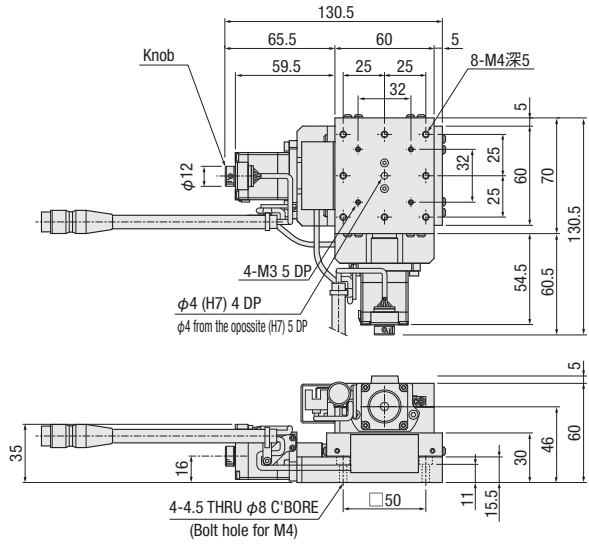
* One end loose position to only stage opposite side.
 * If you choose the option specification, please add the difference to standard price.
 * See page P.1-207, 209~ for more cable details.
 * Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

SPEC

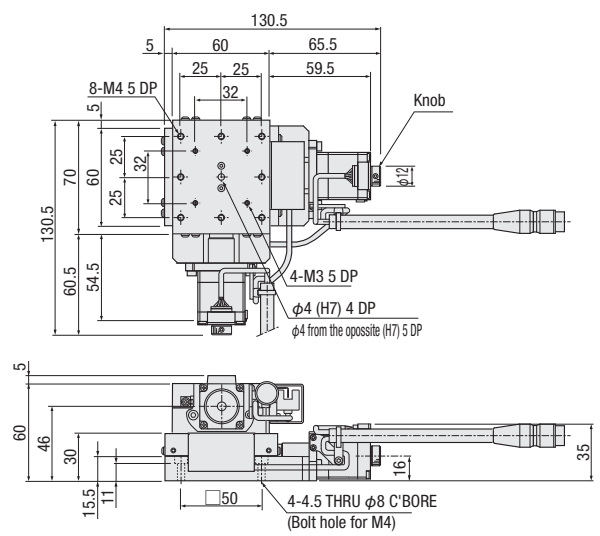
Model	KS201-30LC-5	KS201-30LMS-5
(Opposite hand)	KS201-30RC-5	KS201-30RMS-5
Mechanical specification	30mm	
Travel length	30mm	
Table size	60×70mm	
Feed screw	Ball screw φ8 lead 1	
Guide	Crossed roller guide	
Main materials-Finishing	Aluminum—Black almite finishing	
Weight	1.12kg	1.5kg
Resolution (Pulse)	2μm/1μm	1μm/0.5μm
MAX speed	20mm/sec	10mm/sec
Load capacity	4.5kgf [44.1N]	
Perpendicularity	Within 15μm/Full stroke	
Pitching/Yawing	Within 25"/Within 20"	
Sensor	Installed	
Limit sensor	Installed	
Origin sensor	Installed	
Slit origin sensor	—	
Provided screw (Hexagon-headed bolt)	4 of M4—16	
Synthetic accuracy specification	Within 5μm	
Uni-directional positioning accuracy	Within ±0.3μm	
Repeatability positioning accuracy	Within 1μm	
Lost motion	Within 0.5μm	
Backlash	Within 3μm	
Straightness	Within 3μm	

Dimensional outline drawings

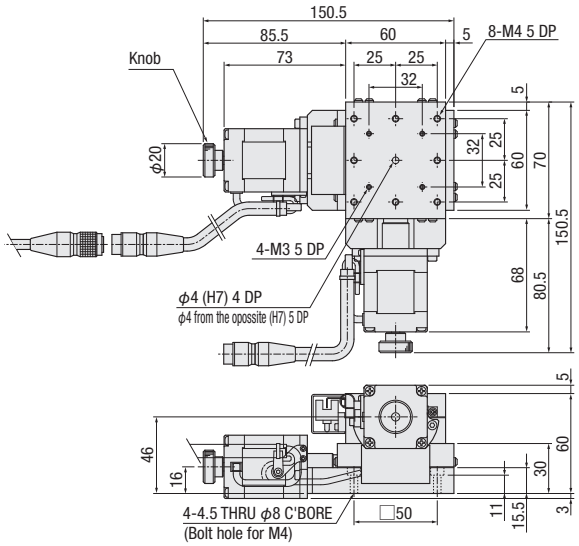
KS201-30LC



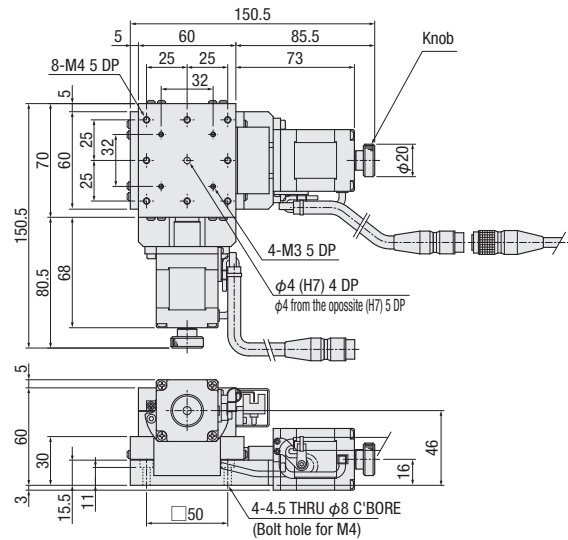
KS201-30RC



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



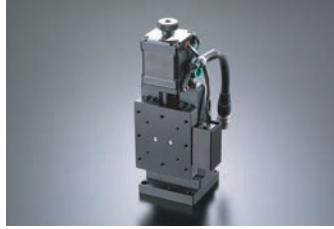
KS301-30LMS



KS301-30RC



KS301-30RMS



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

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).

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

SPEC				
Model	KS301-30LC-5		KS301-30LMS-5	
(Opposite hand)	KS301-30RC-5		KS301-30RMS-5	
Mechanical specification	Travel length	30mm		
	Table size	60×70mm		
	Feed screw	Ball screw φ8 lead 1		
	Guide	Crossed roller guide		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy	Weight	0.89kg	1.07kg	
	Resolution (Pulse)	Full/Half 2μm/1μm	1μm/0.5μm	
	MAX speed	—	0.05μm (1/20 on resolution)	
	Load capacity (Excitation)	20mm/sec	10mm/sec	
	Vertical degree	3.0kgf [29.4N]		
Sensor	Pitching/Yawing	Within 15μm/Full stroke		
	Limit sensor	Within 25°/Within 20"		
	Origin sensor	Installed		
	Slit origin sensor	Installed		
	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

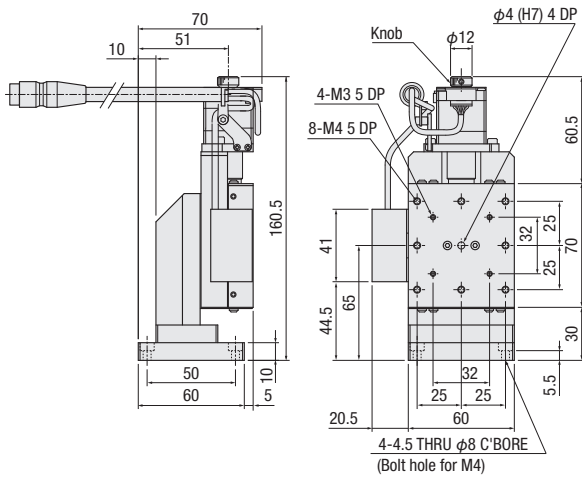
φ100

φ120

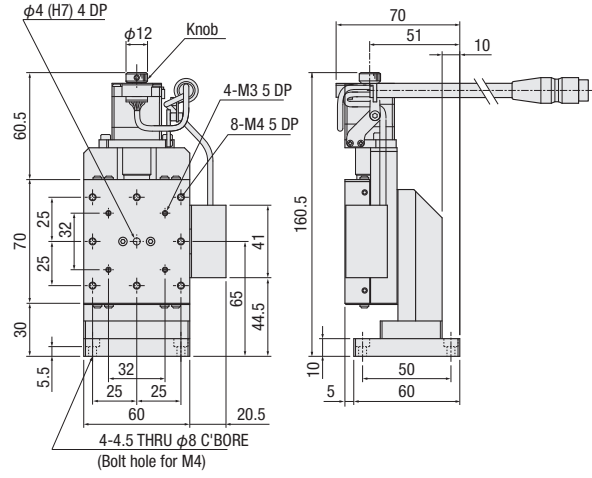
Other

Dimensional outline drawings

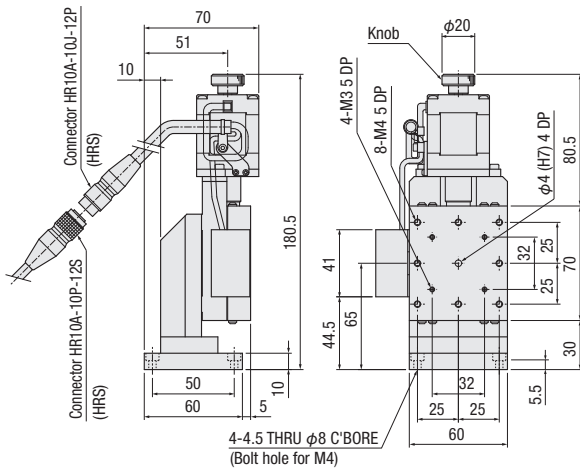
KS301-30LC



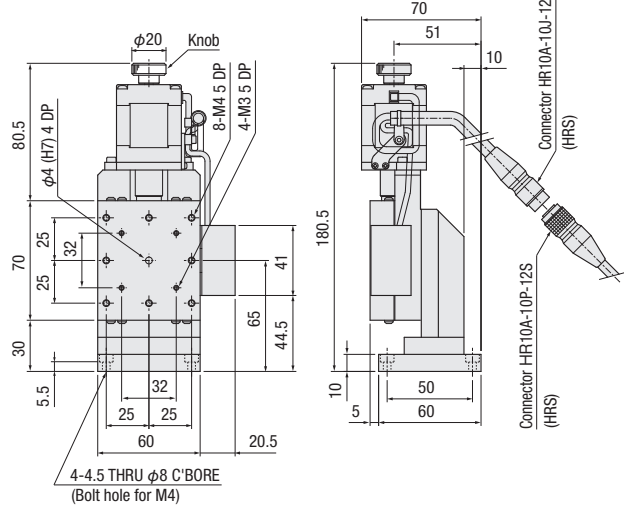
KS301-30RC



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)	
	Driver type	P.1-205~		ARD-K	ARD-A
Connector	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.)	
	Compatible receiving contact	—		170205-1 (Tyco Electronics Japan G.K.)	
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	—			
	Model	Photo microsensor PM-L25 (Panasonic Industrial Devices SUNX)			
	Power voltage	DC5~24V or less ±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 2V or less when the load current is 50mA Residual voltage 1V or less when the load current is 16mA			
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)			

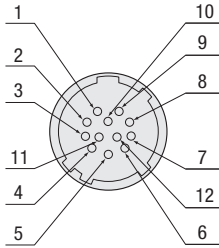
*1 See page P.1-213~ for details of single motor specification

*2 Model is our own management model.

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

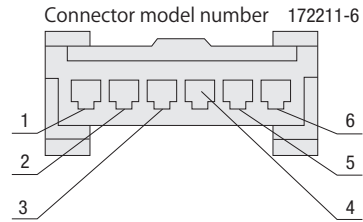
Pin allocation

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



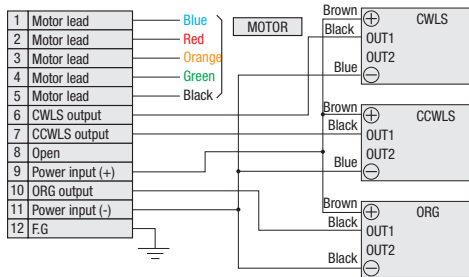
Pin allocation (sensor)

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



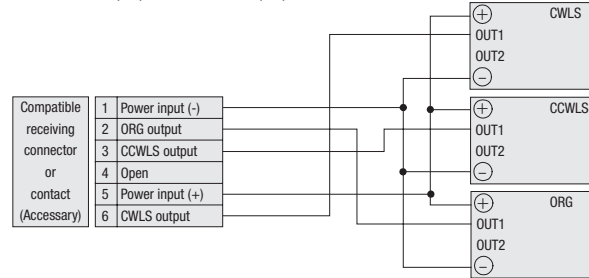
Connection diagram

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

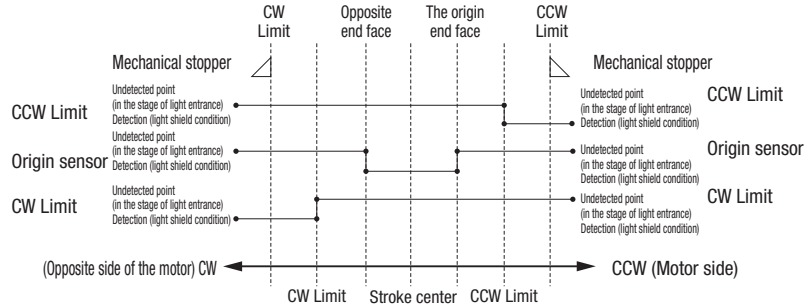
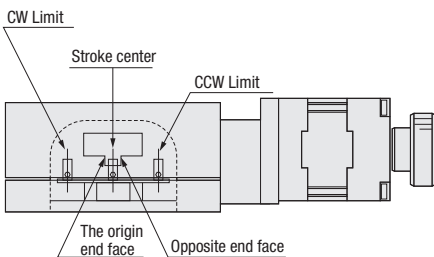


Connection diagram (sensor)

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



Timing chart



Unit [mm]	Reference coordinate	Direction of CW ← → Direction of CCW						
		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.

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

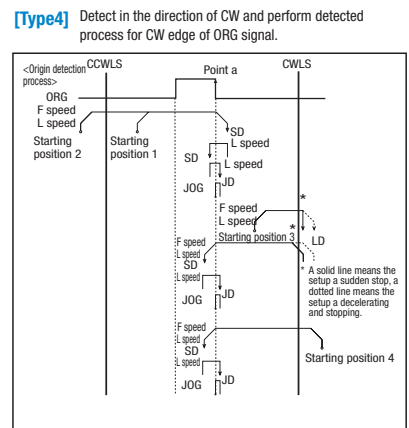
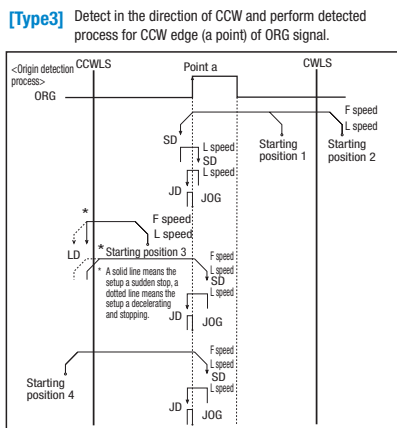
- X
- XY
- Z
- Horizontal Z
- XYZ
- Goniometer
- Rotary
- Unit
- Controller

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~

DC24V type input

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

AC100V input

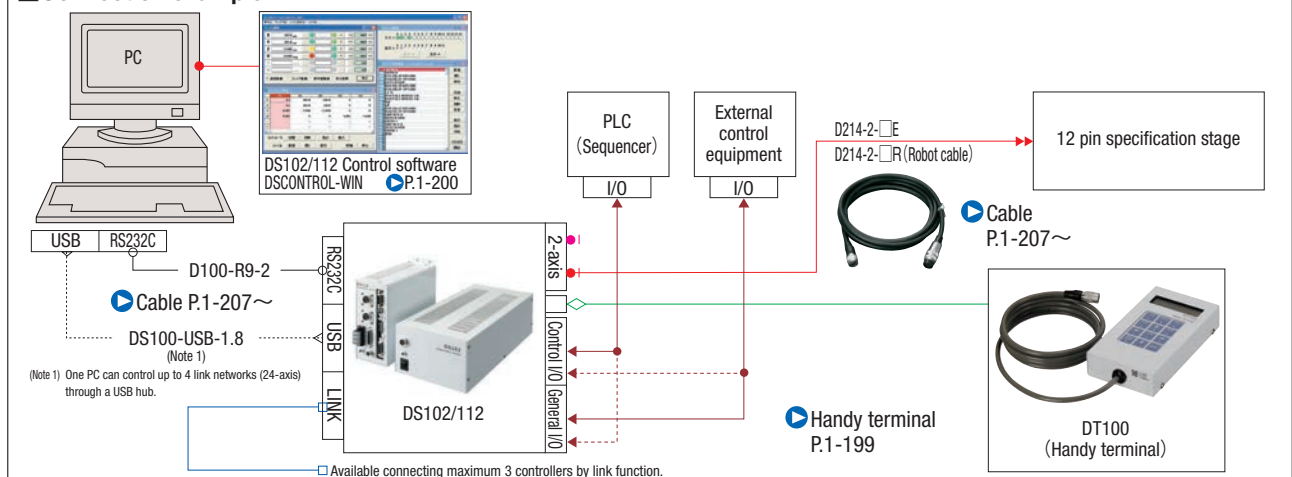
Model	RKD507-A
Divisions	1~1/250 (16 steps)

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

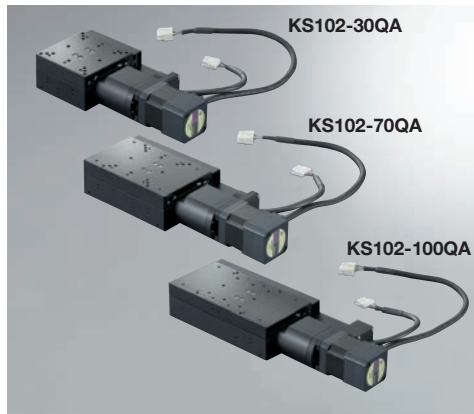
Connection example



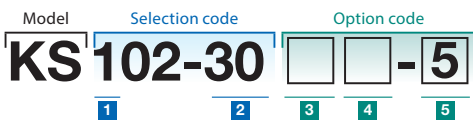
- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

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 α step

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

■ Please contact us

- Available motor with electromagnetic brake
- Resolution is 2 μ 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 (α step)	—
5A	5m (α step)	—
2R	Robot cable 2m (α step)	—
5R	Robot cable 5m (α 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

ϕ 40

ϕ 50

ϕ 60

ϕ 70

ϕ 80

ϕ 100

ϕ 120

Other

SPEC

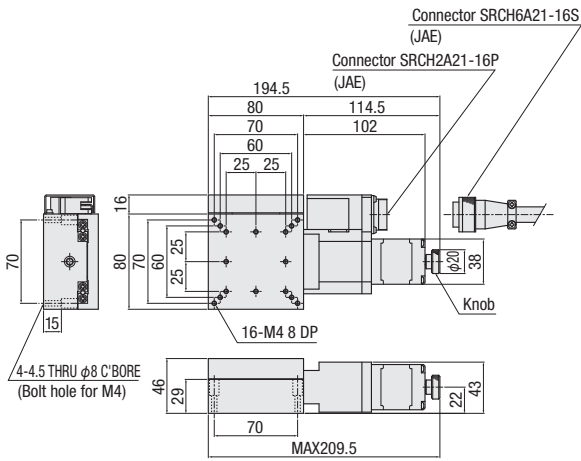
Model	KS102-30-5	KS102-70-5	KS102-100-5	KS102-30QA	KS102-70QA	KS102-100QA
(Opposite hand)	KS102-30R-5	KS102-70R-5	KS102-100R-5	KS102-30RQA	KS102-70RQA	KS102-100RQA
Travel length	30mm	70mm	100mm	30mm	70mm	100mm
Table size	80×80mm	80×130mm	80×160mm	80×80mm	80×130mm	80×160mm
Feed screw	Ball screw ϕ 8 lead 1					
Guide	Crossed roller guide					
Main materials-Finishing	Aluminum – Black almitite finishing					
Weight	1.4kg	1.8kg	2.1kg	1.6kg	2.0kg	2.3kg
Resolution (Pulse)	1 μ m/0.5 μ m			1 μ m (Set to 1000P/R)		
Resolution (Microstep)	0.05 μ m (1/20 on resolution)					
MAX speed	10mm/sec					
Uni-directional positioning accuracy	Within 5 μ m		Within 10 μ m	Within 5 μ m		Within 10 μ m
Repeatability positioning accuracy	Within \pm 0.3 μ 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 μ m					
Backlash	Within 0.5 μ m					
Parallelism	Within 30 μ m					
Motion parallelism	Within 10 μ m	Within 15 μ m		Within 10 μ m	Within 15 μ 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 α 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~.

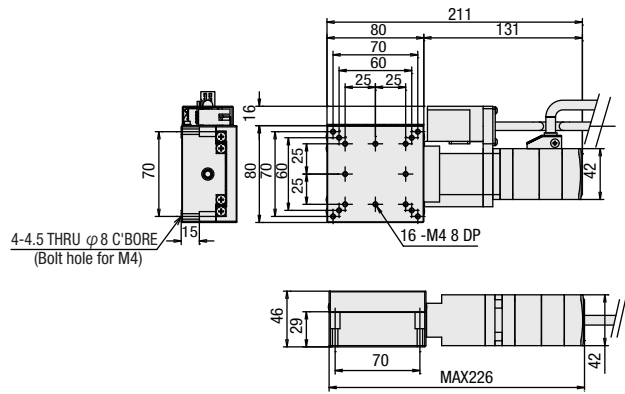
* The controller for α step drive is not supplied.

Dimensional outline drawings

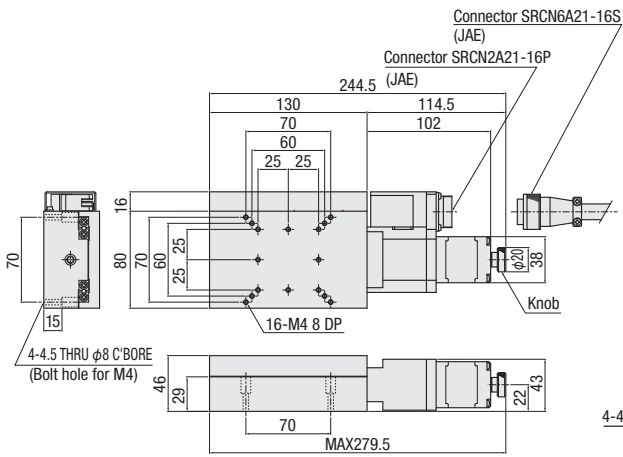
KS102-30



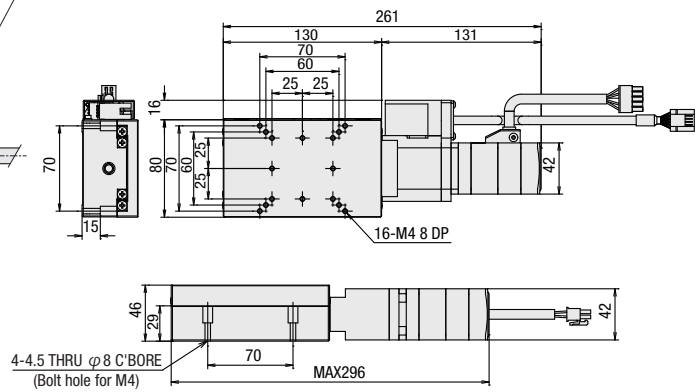
KS102-30QA



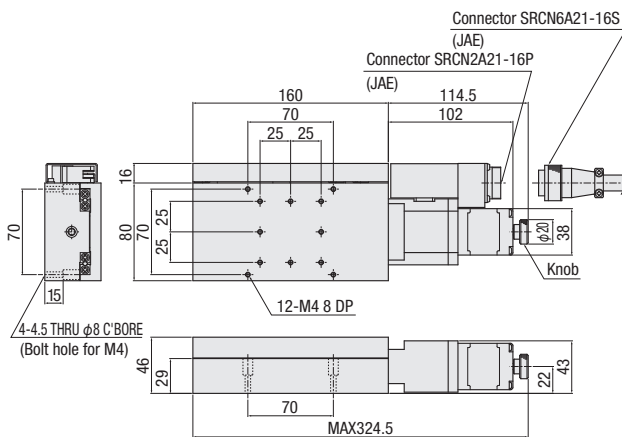
KS102-70



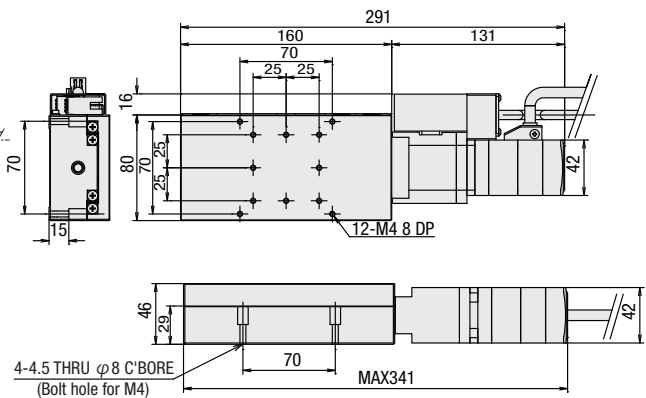
KS102-70QA



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

Motorized Stage

Electrical Specification: KS102

Electrical specification

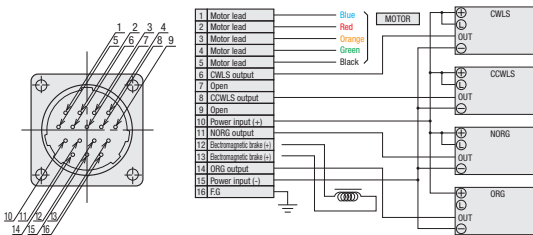
Models		KS102-30	KS102-70	KS102-100	KS102-30QA	KS102-70QA	KS102-100QA
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)			α step motor (Oriental Motor Co.,Ltd.)		
	Model	C7214-9015-1 (□38mm) Model is our own management model.			ARM46AC (□42mm)		
	Step angle	0.36°			0.36° (Set 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)					
	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 16mA					
Output logic	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 2 μm/Pulse(full)

Pin allocation

Connection diagram



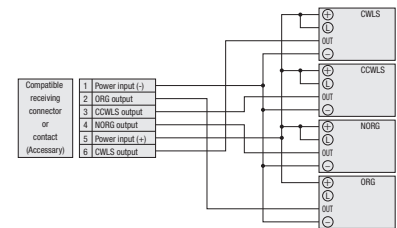
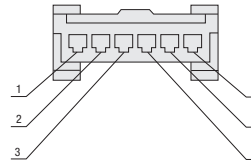
*No.12 and 13 is open without electromagnetic brake.

Pin allocation (sensor)

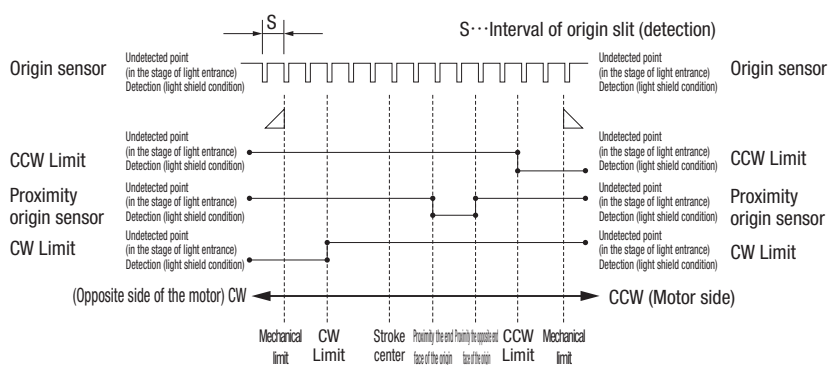
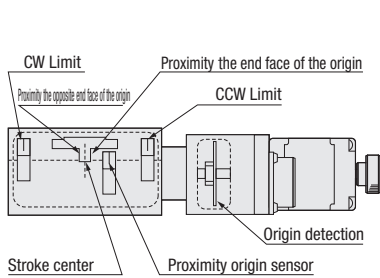
Connection diagram (sensor)

KS102-□□QA

Connector model number 172211-6



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	Return to origin	—	23	7	0	6	9	—	
φ50	Return to origin	—	16	0	7	13	16	—	
φ60	Return to origin	—	63	27	0	6	9	—	
φ70	Return to origin	—	36	0	27	33	36	—	
φ80	Return to origin	—	93	42	0	6	9	—	
φ100	Return to origin	—	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

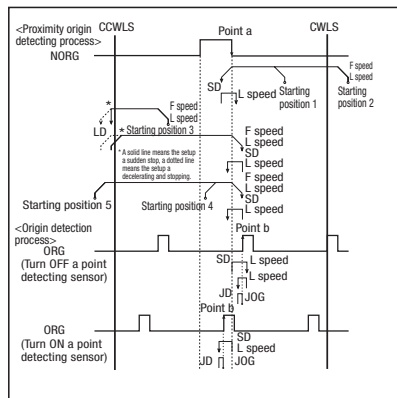
Method for return to origin

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.

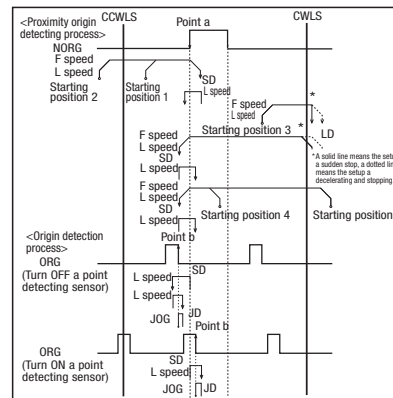
KS102 recommended return to origin Return to origin sequence P.1-206~

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

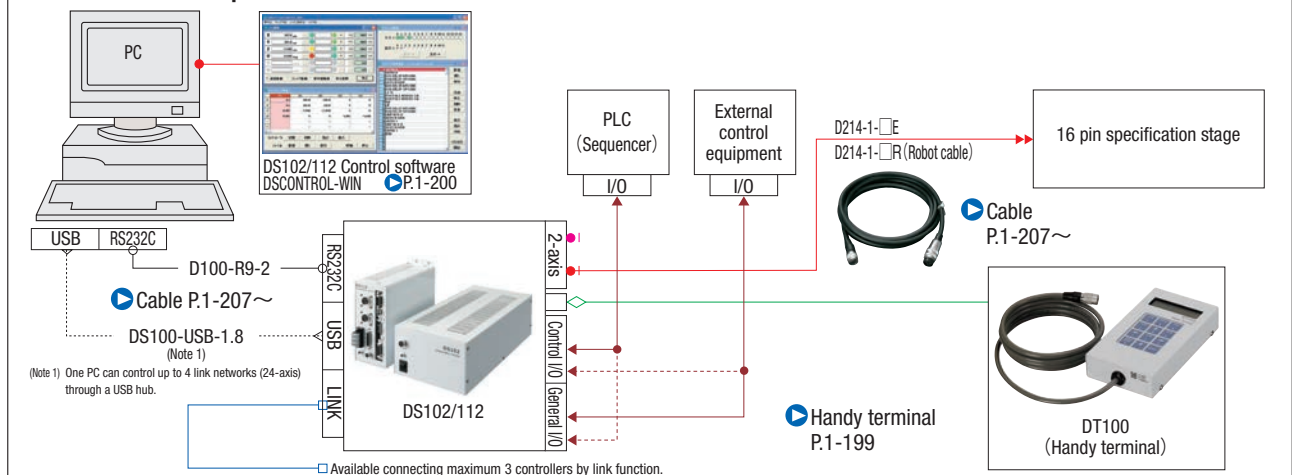
Model	RKD507-A
Divisions	1~1/250 (16 steps)

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



- Linear Ball
- CAVE-X Linear ball
- Cross Roller
- Slide Guide
- φ40
- φ50
- φ60
- φ70
- φ80
- φ100
- φ120
- Other

Motorized Stage

Horizontal Z-axis Stage: KHE04006-C/KHE06008-C(Linear ball guide)

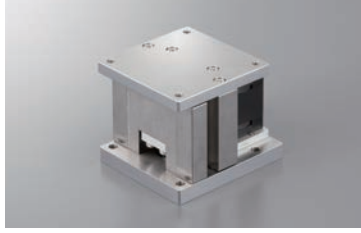
Motorized Stage

RoHS

KHE04006



KHE06008



* The photo shows an image.
The holes and the shape may differ in certain respects from the actual product.

X

XY

Z

Horizontal Z

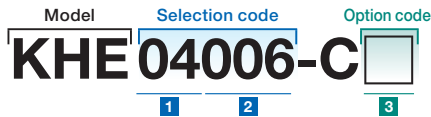
XYZ

Goniometer

Rotary

Unit

Controller



● Cable P.1-207~
● Electrical specification P.1-115~

1 Table size

04	□40mm
06	□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

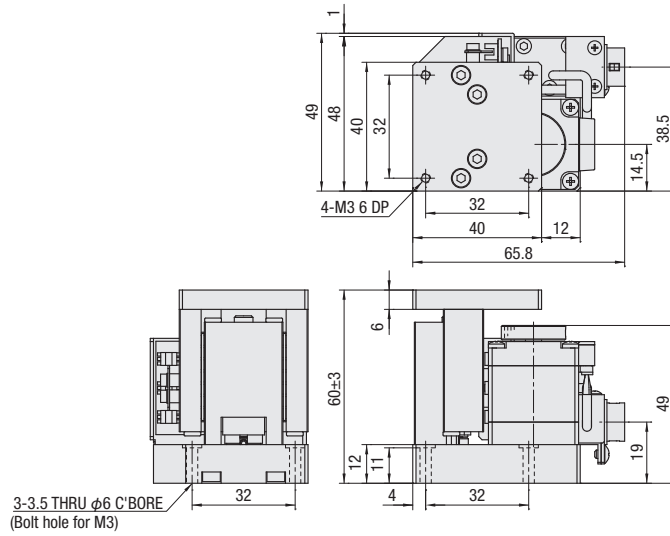
Other

SPEC

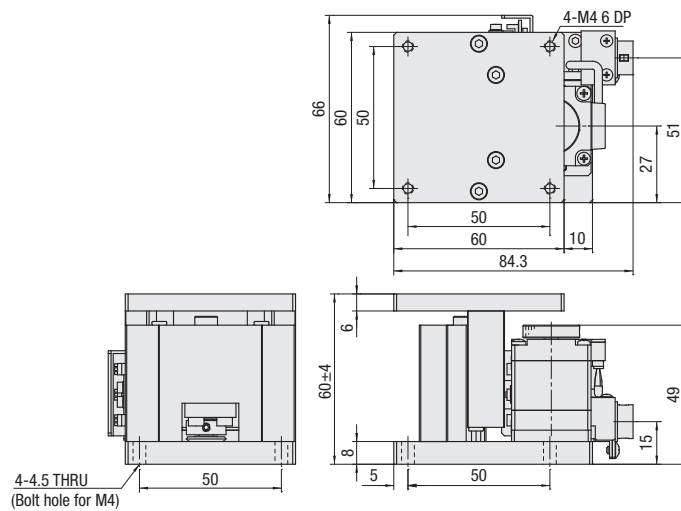
Model	KHE04006-C	KHE06008-C
Travel length	6mm	8mm
Table size	40×40mm	60×60mm
Feed screw (Ball screw)	φ6 lead 1	φ8 lead 1
Guide	Linear ball guide	
Main materials-Finishing	Steel—Opposite side of the end face finishing	
Weight	0.5kg	0.92kg
Resolution (Pulse)	2μm (Full)/1μm (Half)	
MAX speed	10mm/sec	
Positioning 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

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-SX4320(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

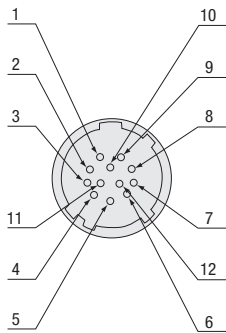
Goniometer

Rotary

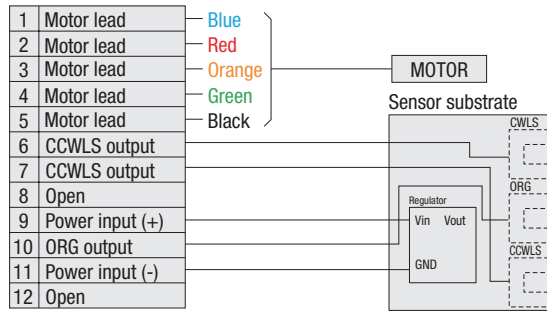
Unit

Controller

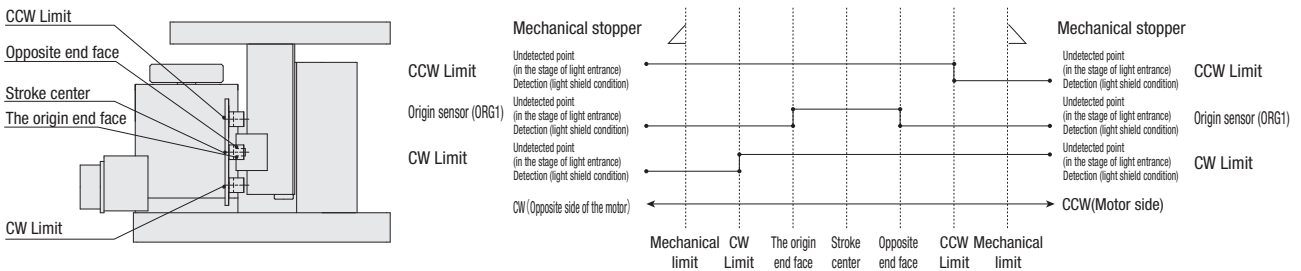
Pin allocation



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
KHE04006-C	Return to origin	3	2.2	0	1	2	4.2	5
	Stroke center	4	3.2	1	0	1	3.2	4
KHE06008-C	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

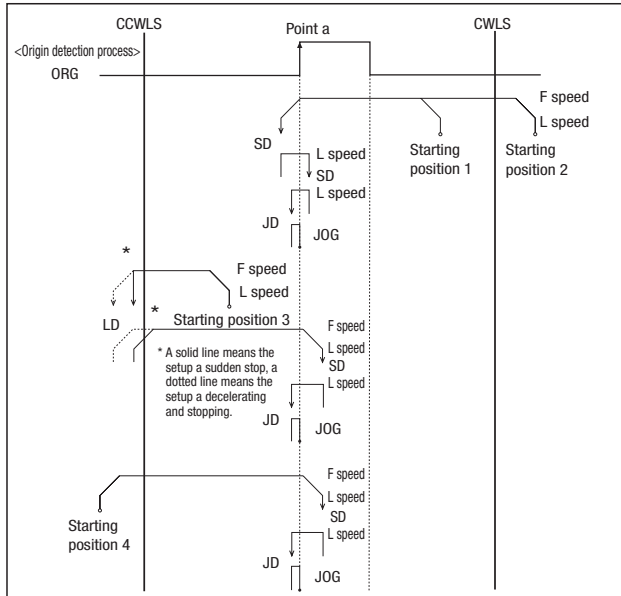
φ120

Other

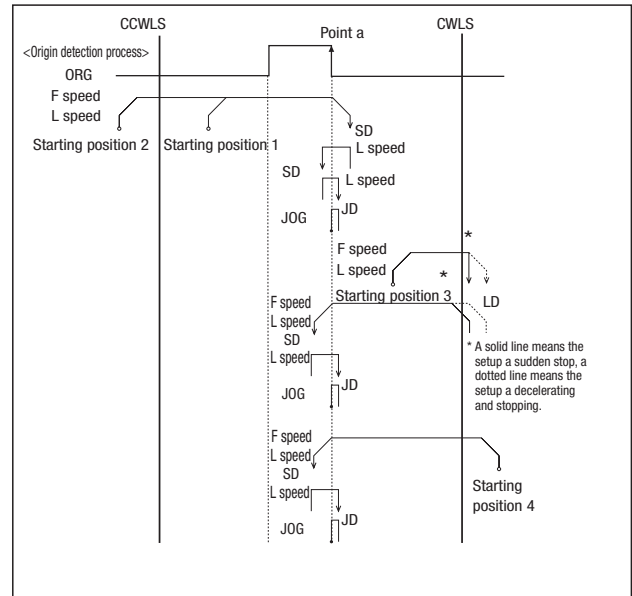
KHE series recommendation return to origin method

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.



[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

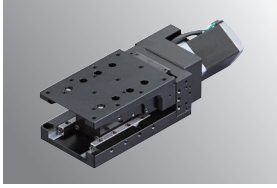
φ100

φ120

Other

Horizontal Z-axis Cross Roller Guide: KHC06004/KHC07004/KS332

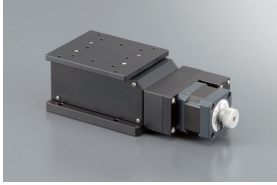
KHC06004F



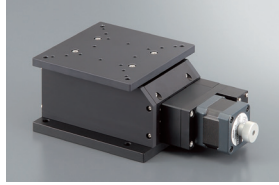
KHC07004F



KS332-8NC



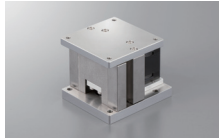
KS332-12C



※ 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
-----	-----

3 Travel

8N	8mm
12	12mm

4 Cable option

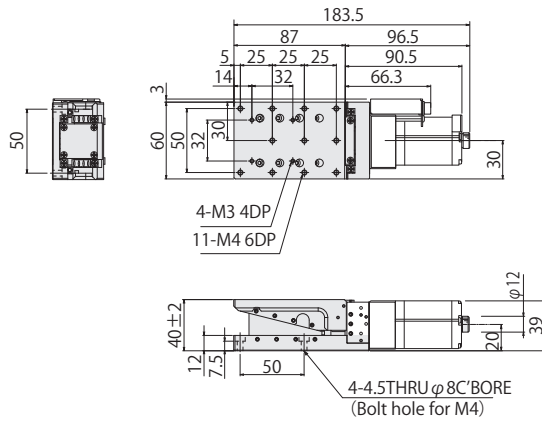
Code	Specification	Cable type
Blank	2m	D214-2-2E
1	2m One end loose	D214-2-2EK
2	4m	D214-2-4E
3	4m One end loose	D214-2-4EK
4	Only connector (Cable is not included)	—
5	Cable is not included (Standard)	—
6	Robot cable 2m	D214-2-2R
7	Robot cable 4m	D214-2-4R
8	Robot cable 4m one end loose	D214-2-4RK
9	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 more cable details.
 * Please select "blank, 2, 6 and 7" when connect with stepping motor controller(DS102/112).

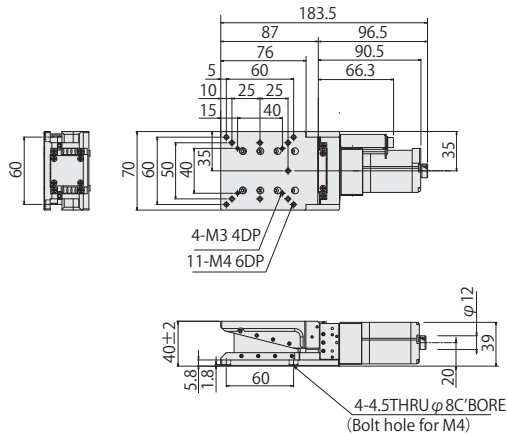
SPEC				
Model	KHC06004F	KHC07004F	KS332-8NC-5	KS332-12C-5
Mechanical specification	Travel length	4mm		8mm / 12mm
	Table size	60×60mm	70×70mm	80×100mm / 120×120mm
	Feed screw	Ball screw φ8 lead 1		Ball screw φ6 lead 1 / Ball screw φ8 lead 1
	Guide	Wedge type Crossed roller guide		
Accuracy specification	Main materials-Finishing	Aluminum—Black almite finishing	Aluminum—White almite finish	Aluminum—Black almite finishing
	Weight	1.14kg	1.18kg	2.0kg / 3.6kg
Sensor	Resolution (Pulse)	0.25 μm (Full)/0.125 μm (Half)		≈0.73 μm (Full)/0.365 μm (Half)
	MAX speed	2.5mm/sec		≈3.7mm/sec
	Uni-directional positioning accuracy	Within 7 μm		—
	Repeatability positioning accuracy	Within ±0.5 μm		
	Load capacity	7kgf [68.6N]		20kgf [196N]
Other	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 1 μm		
	Parallelism	Within 50 μm		
Sensor	Limit sensor	Installed		
	Origin sensor	Installed		
	Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)	4 of M4—12		4 of M4—16	4 of M6—16

Dimensional outline drawings

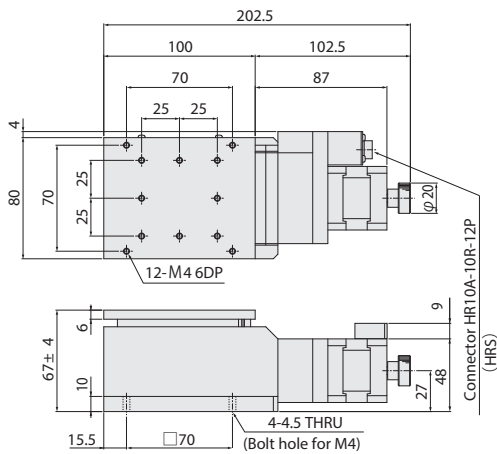
KHC06004F



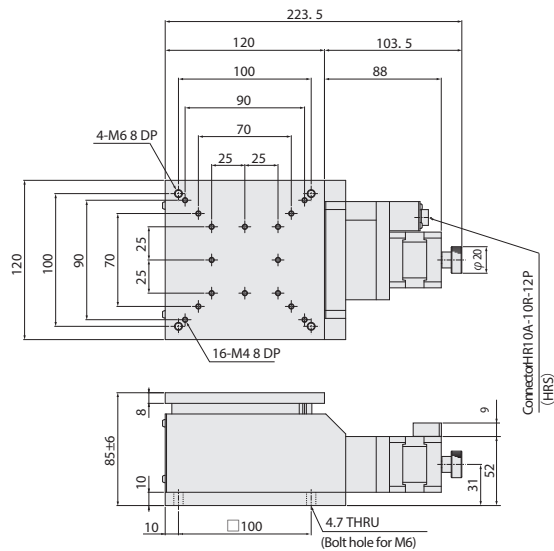
KHC07004F



KS332-8NC



KS332-12C



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

118

Electrical Specification: KHC06004F/KHC07004F/KS332-8NC/KS332-12C

Electrical specification

Models		KHC06004F	KHC07004F	KS332-8NC	KS332-12C	
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co.,Ltd.)				
	Model	PK525HPB-C1 (□28mm)		PK544PB-C18		
	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-SX4320(omuron Co.,Ltd.)	Limited switch AV4044 (Panasonic) 0.1A 30V DC Photo microsensor EE-SX671 (Omuron 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.

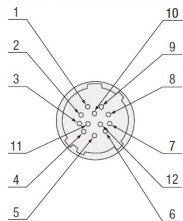
Pin allocation

Connection diagram

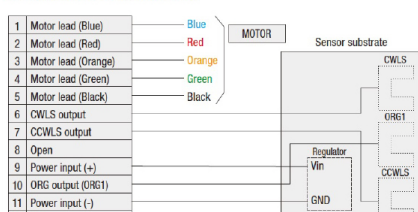
Pin allocation

Connection diagram

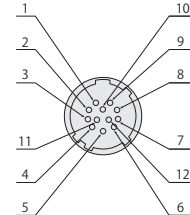
KH06004F/KH07004F



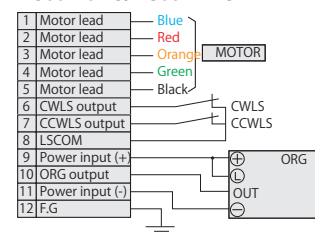
KHC06004F/KHC07004F



KS332-8NC/KS332-12C

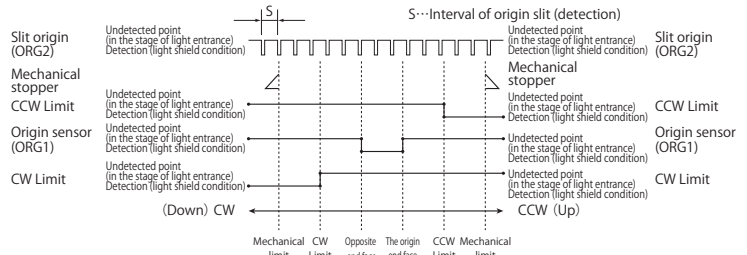
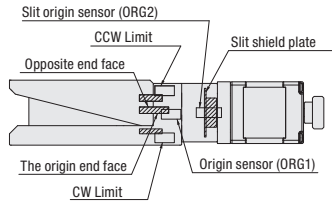


KS332-8NC/KS332-12C



Timing chart

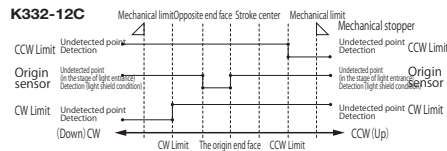
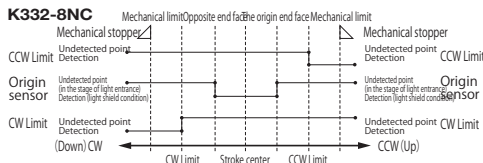
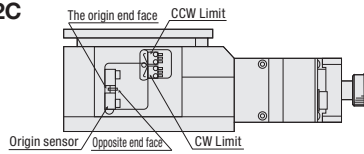
KHC06004F/KHC07004F



Unit [mm]	Direction of CW ←		Direction of CCW →				
	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	The origin end face stroke center	CCW Limit	Mechanical limit
KHC06004F	Return to origin	2.5	2.2	1.5	0	2.2	2.5
KHC07004F	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.

KS332-8NC/KS332-12C



Unit [mm]	Direction of CW ←		Direction of CCW →					
	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Stroke center	The origin end face	CCW Limit	Mechanical limit
KS332-8NC	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]	Direction of CW ←		Direction of CCW →					
	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Stroke center	The origin end face	CCW Limit	Mechanical limit
KS332-12C	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.

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/KS332-8NC/KS332-12C 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)