KXG series

SURUGA SEIKI

CAVE-X POSITIONER

X-axis Linear Ball Guide : KXG06020/KXG06030

KXG06020

KXG06030

Freely customize the motor

RoHS

See page ▶ P.009

■The drive unit areas are coated in clean grease.

Model: KXG06 | Selection code: 020 | Option code: -C□

1 2 3

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

1 Travel length

020	20mm
030	30mm

2 Motor option

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

* Code MA · PA is the set of driver and cable.
* See page ▶ P.1-051～ for details of Motor option.

3 Cable option

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

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

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

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

SPEC

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

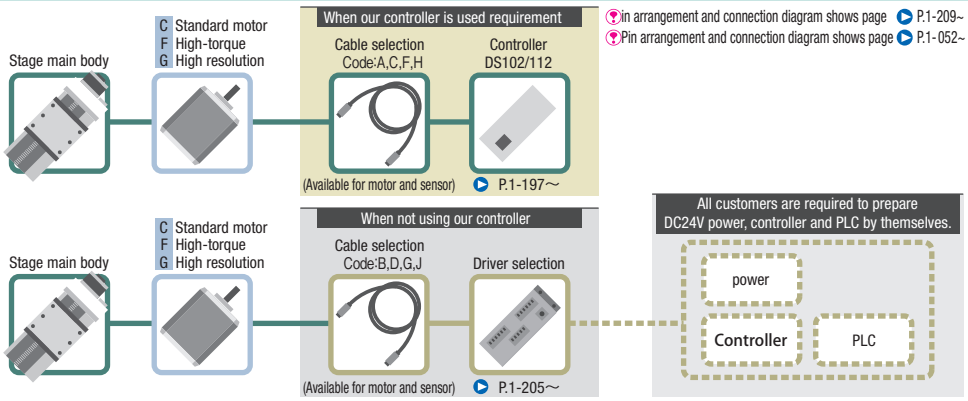
※ Might be changed specification due to motors. See page ▶ P.1-213～ for details.

Motor option

C Standard motor
Motor model
C005C-90215P-1

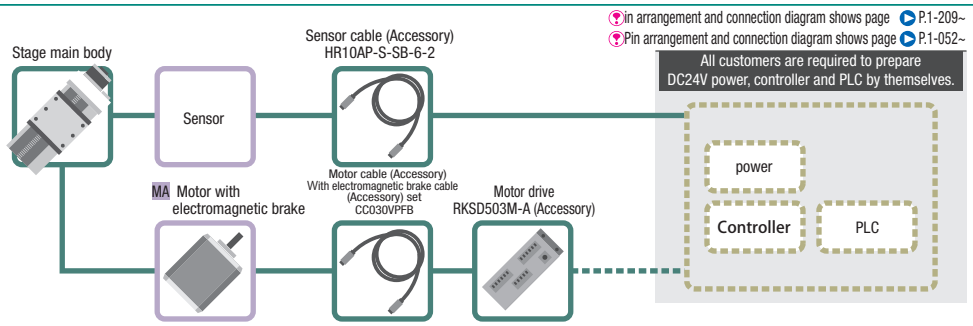
F High-torque
Motor model
PK525HPB-C1

G High resolution
Motor model
PK523HPMB-C1



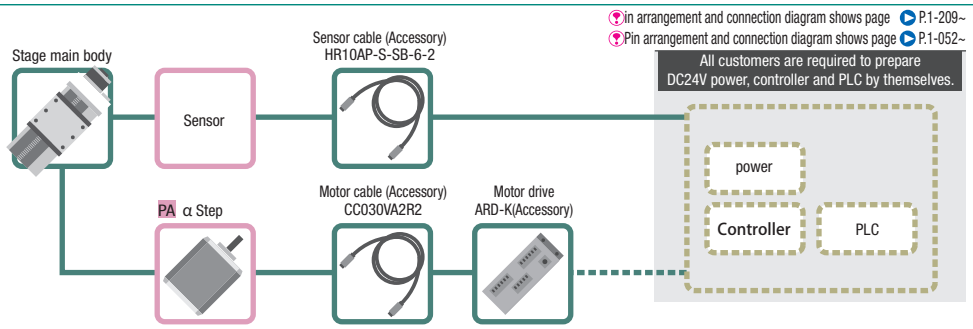
Motor option

MA With electromagnetic brake
Motor model
PKE545MC-A1



Motor option

PA α Step
Motor model
ARM24SAK



Motor code			C	F	G	MA	PA
Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out
Type			5 phase stepping motor 0.75A/Phase			5 phase 0.35A/Phase	α step motor
Model*			**C005C-90215P-1**	**PK525HPB-C1**	**PK523HPMB-C1**	**PKE545MC-A1**	**ARM24SAK**
Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm (Set to 1000P/R)
		Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	–
MAX speed	Lead 1mm		20mm/sec	30mm/sec	20mm/sec	25mm/sec	30mm/sec

* Model is our own management model.

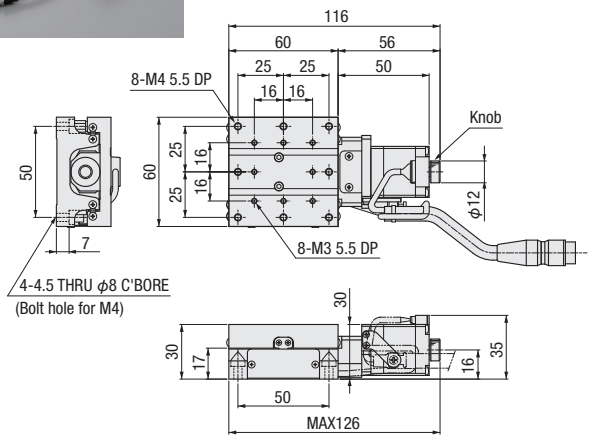
CAVE-X POSITIONER

X-axis Linear Ball Guide: KXG06020/KXG06030

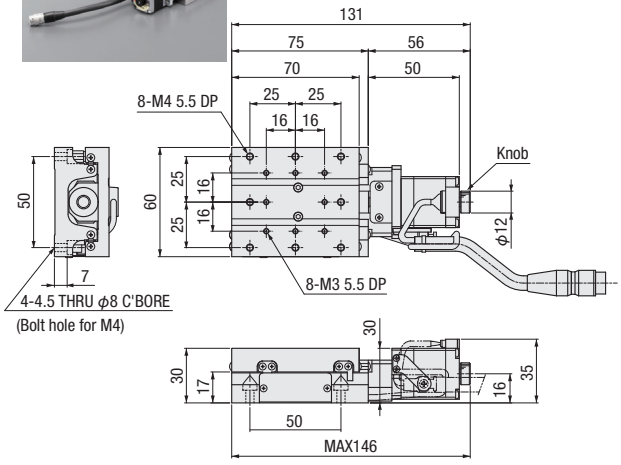
Dimensional outline drawings

※The photo shows an image.

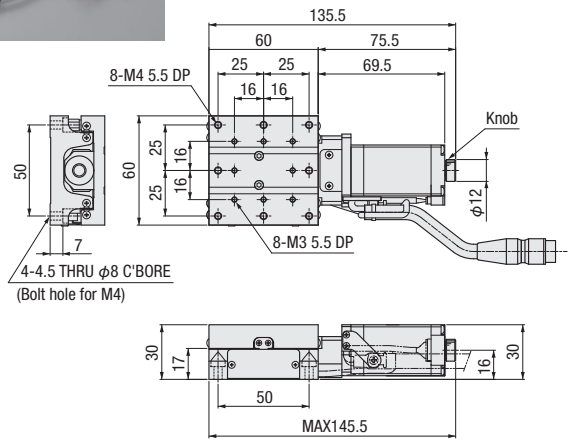
KXG06020-C



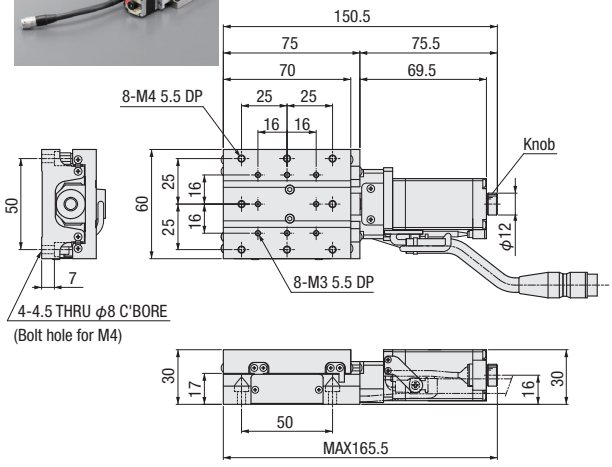
KXG06030-C



KXG06020-F



KXG06030-F



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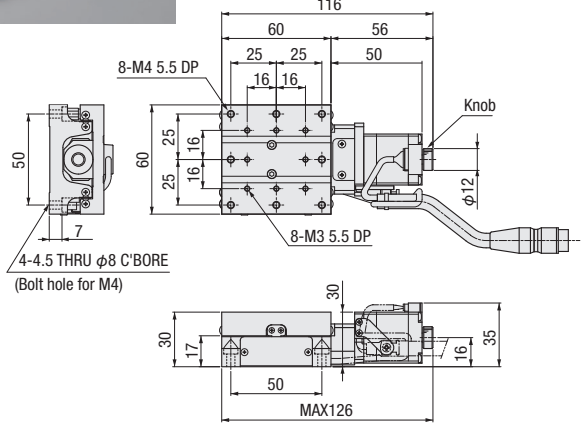
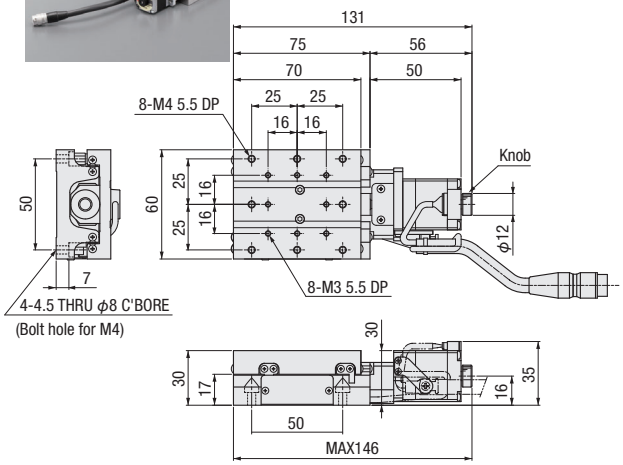


KXG06030-G



Dimensional outline drawings

C Standard motor

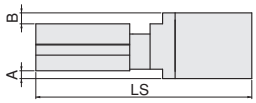
Motor model C005C-90215P-1

F High-torque

Motor model PK525HPB-C1

G High resolution

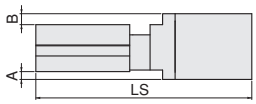
Motor model PK523HPMB-C1



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

MA With electromagnetic brake

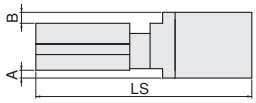
Motor model PKE545MC-A1



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

PA α step

Motor model ARM24SAK

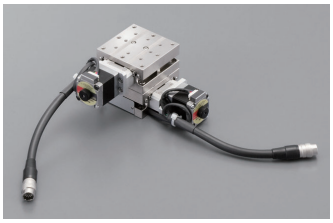


Model	PA (α step)			C (Standard)	
	Motor size	A	B	LS	
KXG06020-PA	□28	—	—	129	116
KXG06030-PA				144	131

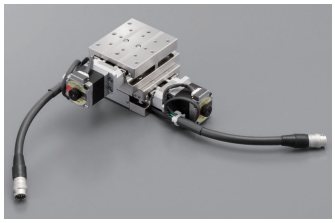
CAVE-X POSITIONER

XY-axis Linear Ball Guide: KYG06020/KYG06030

KYG06020



KYG06030



RoHS

Model: KYG06 | Selection code: 020 (1) | Option code: -C (2) □ (3)

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

1 Travel length

020	20mm
030	30mm

2 Motor option

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

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

3 Cable option

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

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

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

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

SPEC

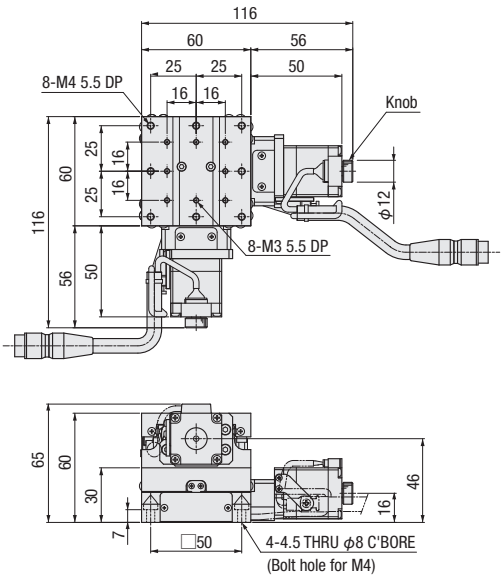
Model			KYG06020-C	KYG06020-F	KYG06020-G	KYG06030-C	KYG06030-F	KYG06030-G
Mechanical specification	Travel length		20mm			30mm		
	Table size		60×60mm			60×70mm		
	Feed screw (Ball screw)		φ8 lead 1					
	Guide		Linear ball guide					
	Main materials-Finishing		Stainless–Opposite side of the end face finishing					
	Weight		1.56kg	1.74kg	1.56kg	1.8kg	1.98kg	1.8kg
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm		1μm/0.5μm
		Microstep	0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)	0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)
	MAX speed		20mm/sec	30mm/sec	20mm/sec	20mm/sec	30mm/sec	20mm/sec
	Load capacity		4kgf [39.2N]					
	Perpendicularity		Within 10μm/Full stroke			Within 15μm/Full stroke		
	Pitching/Yawing		Within 20″/15″					
Sensor	Limit sensor		Installed					
	Origin sensor		Installed					
	Slit origin sensor		–					
Provided screw (Hexagon-headed bolt)			4 of M4—14					

Single axis accuracy specification		
	Uni-directional positioning accuracy	Within 5μm
	Repeatability positioning accuracy	Within ±0.5μm
	Lost motion	Within 1μm
	Backlash	Within 1μm
	Straightness	Within 3μm

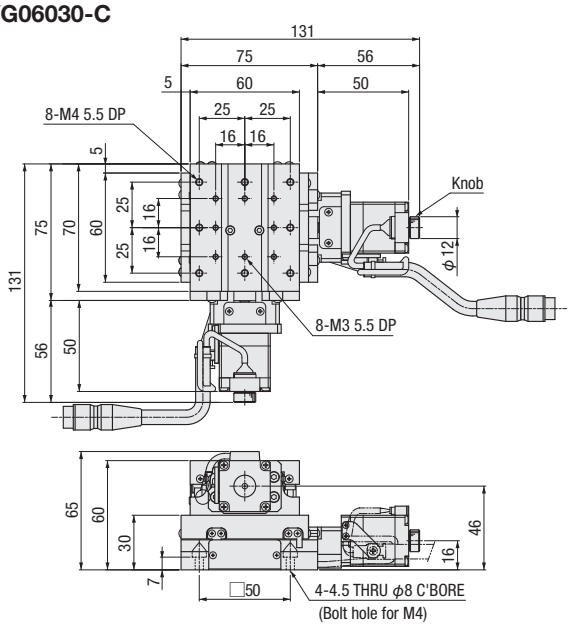
※ Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

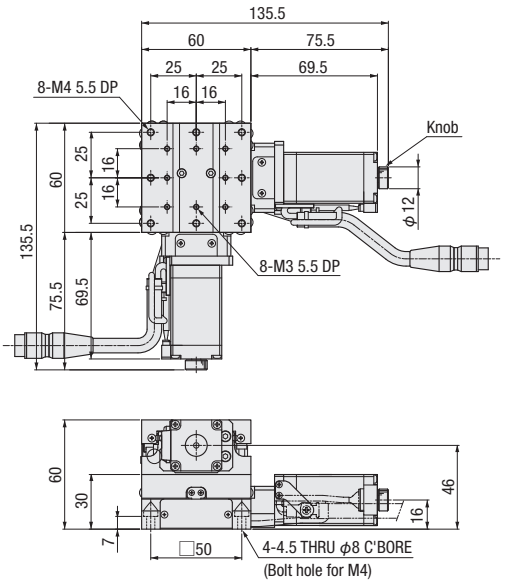
KYG06020-C



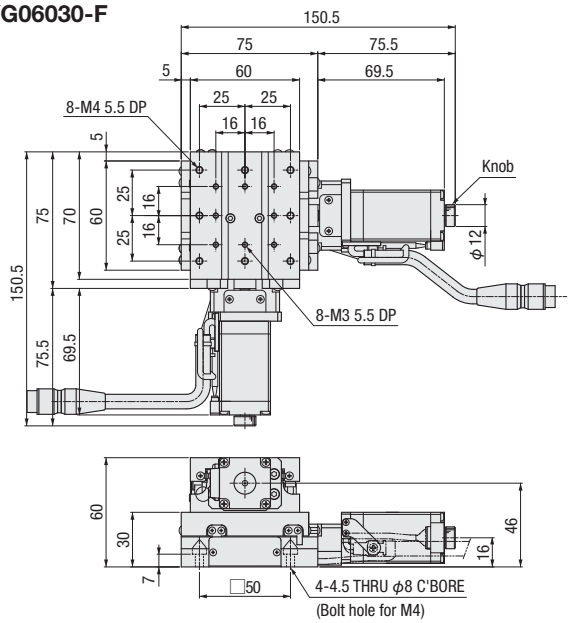
KYG06030-C



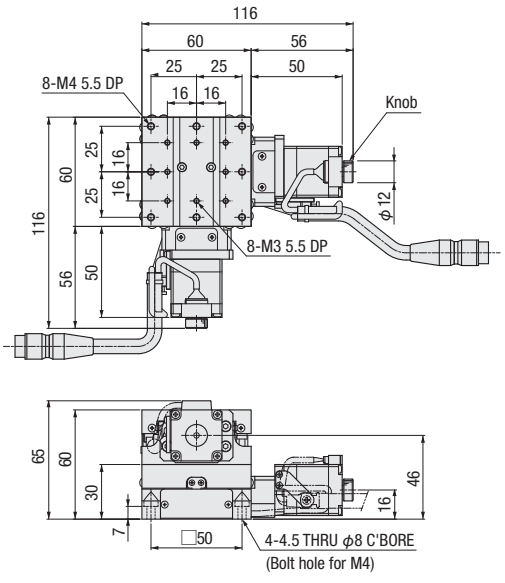
KYG06020-F



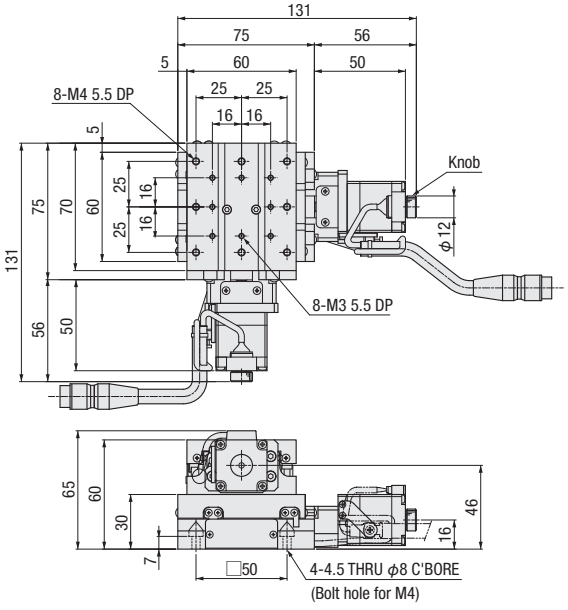
KYG06030-F



KYG06020-G



KYG06030-G



CAVE-X POSITIONER

Z-axis Linear Ball Guide: KZG06020/KZG06030

KZG06020

KZG06030

RoHS

Model: **KZG06** | Selection code: **020** (1) | Option code: **-C** (2) □ (3)

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

1 Travel length

020	20mm
030	30mm

2 Motor option

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

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

3 Cable option

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

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

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

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

SPEC

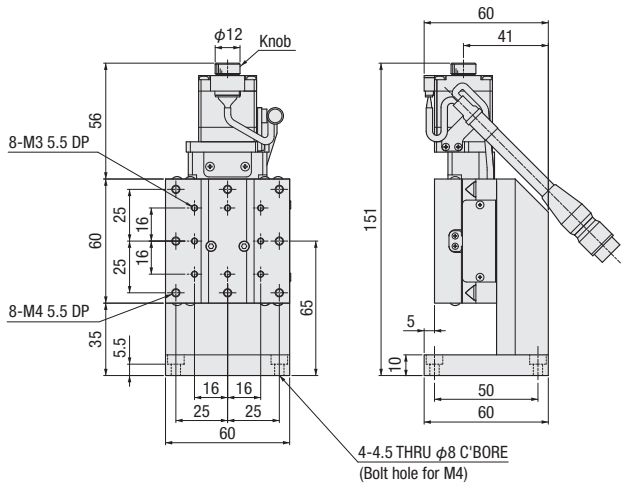
Model		KZG06020-C	KZG06020-F	KZG06020-G	KZG06030-C	KZG06030-F	KZG06030-G
Mechanical specification	Travel length	20mm			30mm		
	Table size	60×60mm			60×70mm		
	Feed screw (Ball screw)	φ8 lead 1					
	Guide	Linear ball guide					
	Main materials-Finishing	Stainless—Opposite side of the end face finishing					
	Weight	1.14kg	1.23kg	1.14kg	1.26kg	1.35kg	1.26kg
Accuracy specification	Resolution (Pulse) Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm		1μm/0.5μm
	Resolution (Pulse) Microstep	0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)	0.1μm (1/20 on resolution)		0.05μm (1/20 on resolution)
	MAX speed	20mm/sec	30mm/sec	20mm/sec	20mm/sec	30mm/sec	20mm/sec
	Load capacity (Excitation)	3kgf [29.4N]					
	Vertical degree	Within 10μm/Full stroke			Within 15μm/Full stroke		
	Pitching/Yawing	Within 20″/15″					
Sensor	Limit sensor	Installed					
	Origin sensor	Installed					
	Slit origin sensor	—					
Provided screw (Hexagon-headed bolt)		4 of M4—10					

Single axis accuracy specification		
	Uni-directional positioning accuracy	Within 5μm
	Repeatability positioning accuracy	±0.5μm
	Lost motion	Within 1μm
	Backlash	Within 1μm
	Straightness	Within 3μm

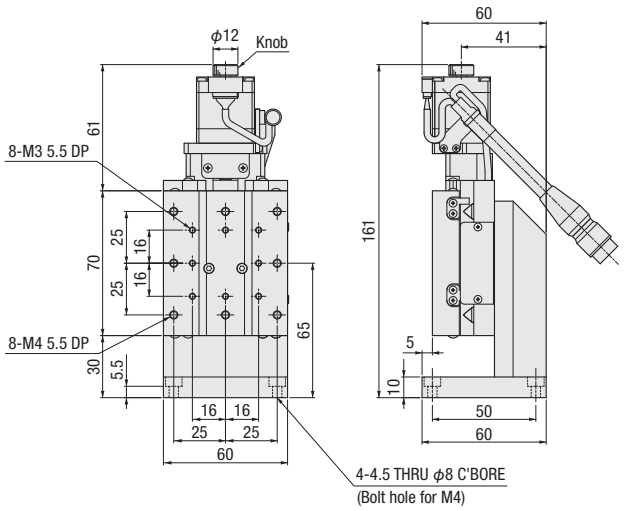
* Might be changed specification due to motors. See page P.1-213～ for details.

Dimensional outline drawings

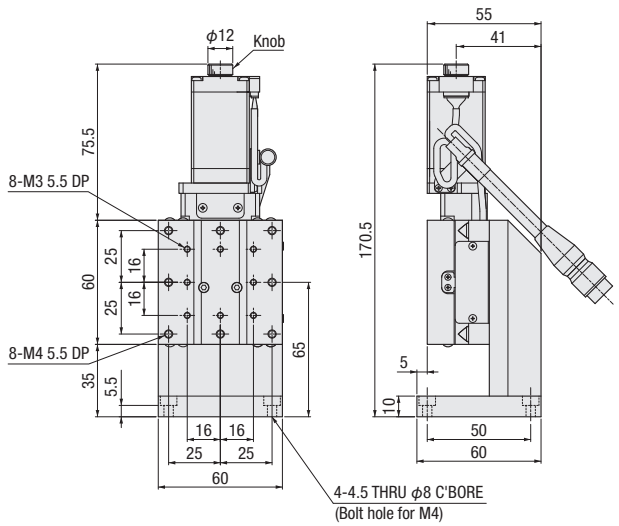
KZG06020-C



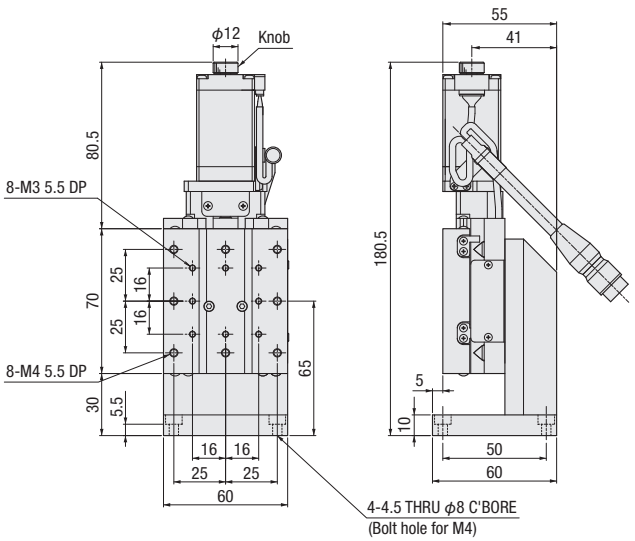
KZG06030-C



KZG06020-F



KZG06030-F



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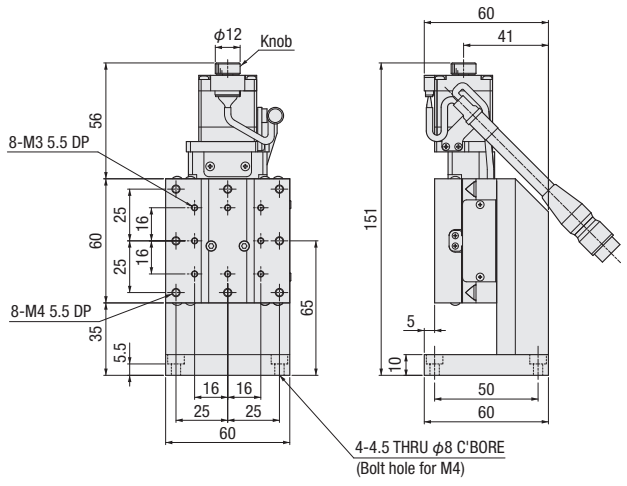
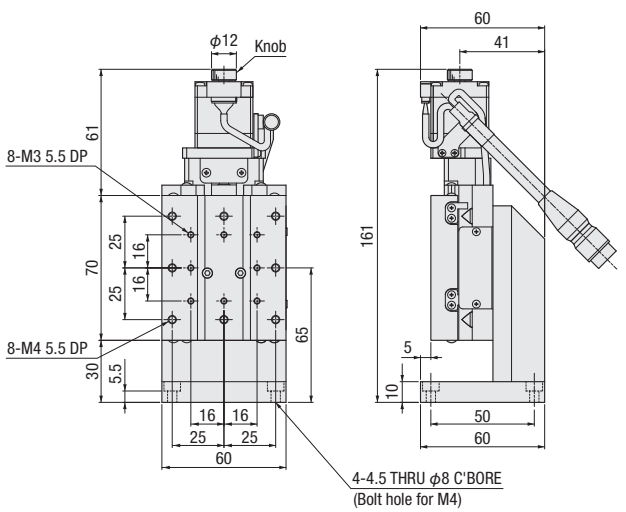


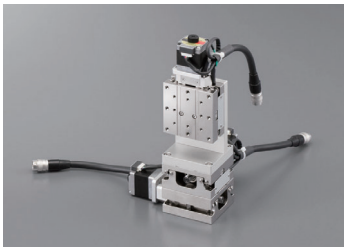
KZG06030-G



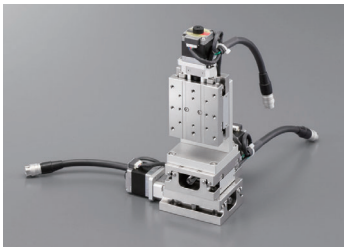
CAVE-X POSITIONER

XYZ-axis Linear Ball Guide: KWG06020/KWG06030

KWG06020



KWG06030



RoHS

Model: KWG06 | Selection code: 020 | Option code: -C□ (1 | 2 | 3)

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

1 Travel

020	20mm
030	30mm

2 Motor option

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

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

3 Cable option

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

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

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

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

SPEC

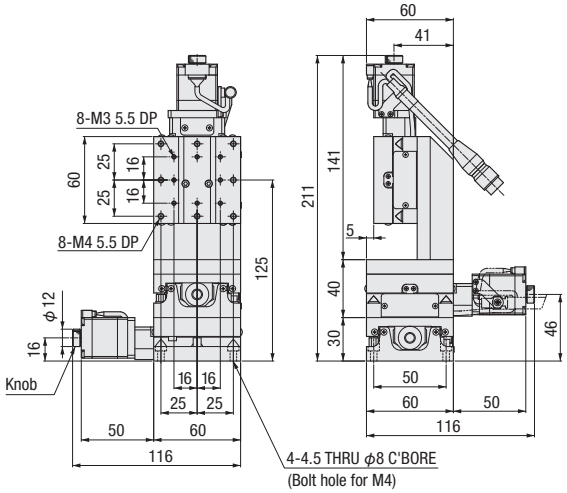
Model			KWG06020-C	KWG06020-F	KWG06020-G	KWG06030-C	KWG06030-F	KWG06030-G
Mechanical specification	Travel length		20mm			30mm		
	Table size		60×60mm			60×70mm		
	Feed screw (Ball screw)		ϕ8 lead 1					
	Guide		Linear ball guide					
	Main materials-Finishing		Stainless–Opposite side of the end face finishing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

Single axis accuracy specification		
	uni-directional positioning	Within 5μm
	Repeatability positioning	Within ±0.5μm
	Lost motion	Within 1μm
	Backlash	Within 1μm
	Straightness	Within 3μm

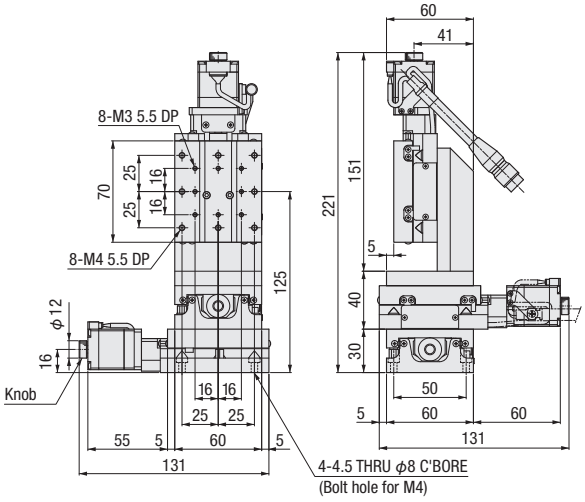
* Might be changed specification due to motors. See page P.1-213 for details.

Dimensional outline drawings

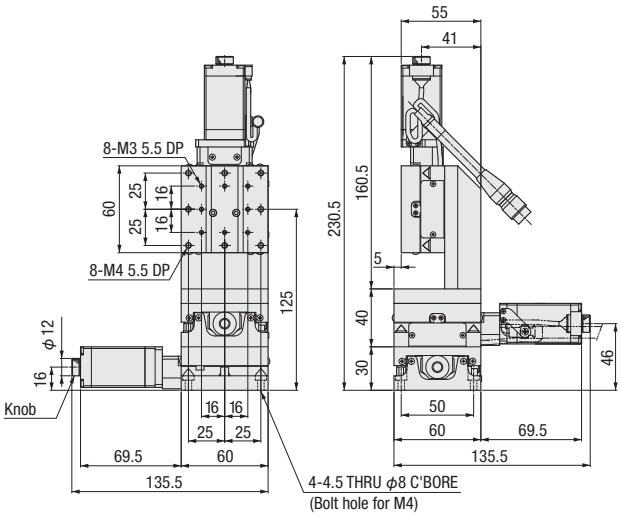
KWG06020-C



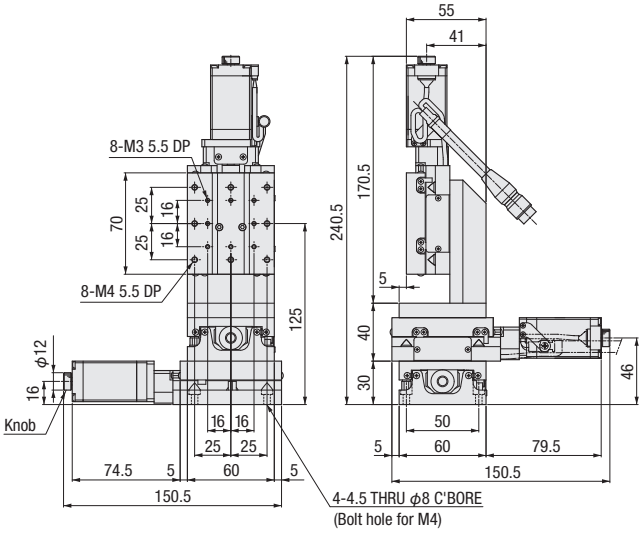
KWG06030-C



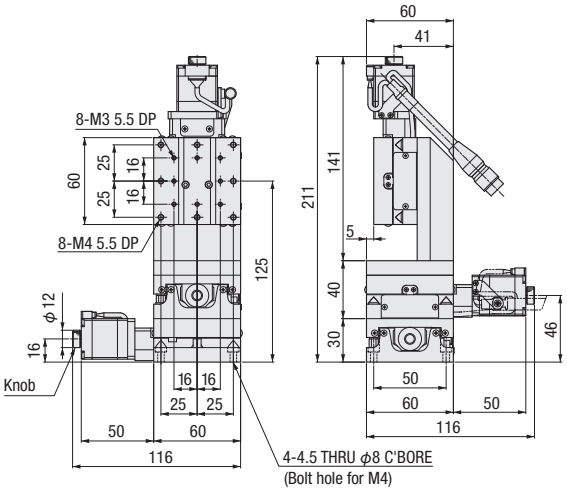
KWG06020-F



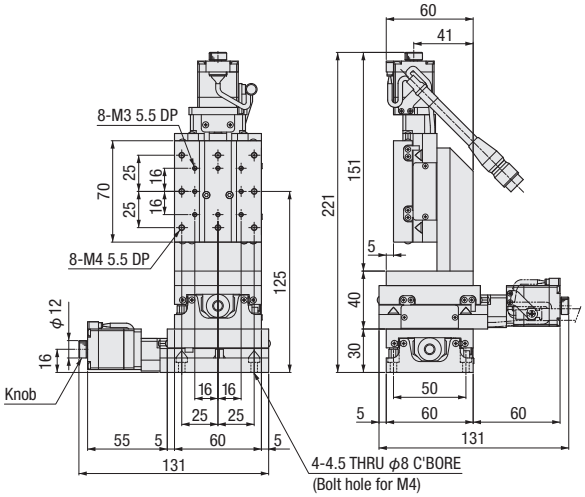
KWG06030-F



KWG06020-G



KWG06030-G



Electrical Specification: KXG06020 / KXG06030

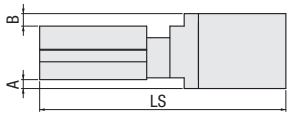
Electrical specification

Motor code			C	F	G	MA	PA
Models			KXG06020 / KXG06030				
MotorSpecification (*1)	Type		5 phase stepping motor 0.75A/Phase			5 phase stepping motor 0.35A/phase	α step motor
	Feature		Standard	High-torque	High resolution	With electromagnetic brake	Small step-out
	Model (*2)		C005C-90215P-1	PK525HPB-C1	PK523HPMB-C1	PKE545MC-A1	ARM24SAK
	Brake		N/A			Installed	N/A
	Maker		Oriental Motor Co., Ltd.				
	Step angle (Position detector)		0.72°	0.72°	0.36°	0.72°	0.36° (Set to 1000P/R)
	Mass		0.11kg	0.2kg	0.11kg	0.52kg	0.15kg
	Motor size	□size	28mm	28mm	28mm	42mm	28mm
		L size	42mm	61.5mm	42mm	69mm	45mm
	Excitation (moment) maximum torque		0.041N・m	0.073N・m	0.038N・m	0.240N・m	0.055N・m
	Driver type		P.1-205～			RKSD503M-A	ARD-K
	Input power (Voltage・frequency)					Single phase AC100-120V 50/60Hz	DC24V±10%
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)				
Connector	Motor	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)			motor side:5557-06R-210(MOLEX) electromagnetic brake side:5557-02R-210(MOLEX)	43025-1000 (Japan Molex)
		Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)			motor side:5559-06P-210(MOLEX) electromagnetic brake side:5559-02P-210(MOLEX)	43020-1000 (Japan Molex)
	Sensor	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)※In common with a motor			HR10A-7J-6P (73) (Hirose Electric Co., Ltd.)	
		Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)※In common with a motor			HR10A-7P-6S (73) (Hirose Electric Co., Ltd.)	
Accuracy specification	Resolution Lead 1mm	Full/Half	2μm/1μm	2μm/1μm	1μm/0.5μm	2μm/1μm	1μm(Set to 1000P/R)
		Micro step (1/20 split)	0.1μm	0.1μm	0.05μm	0.1μm	–
	MAX speed	Lead 1mm	20mm/sec	30mm/sec	20mm/sec	25mm/sec	30mm/sec

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

Tne diameter outside drawings

KXG series

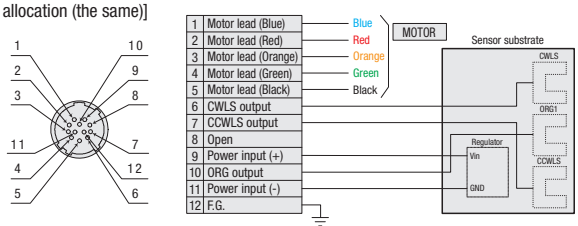


Motor code	Size □ [mm]	A	B	LS 20	LS 30
C	28	–	0	116	131
F	28	–	0	136	151
G	28	–	0	116	131
MA	42	5	7	164	179
PA	28	–	0	129	144

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

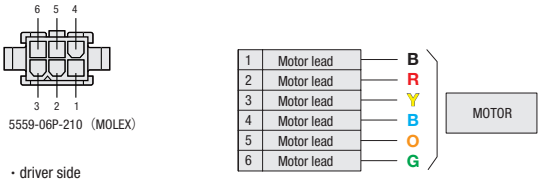
Pin allocation・Connection diagram

Motor code		KXG series
C・F・G	Available for motor and sensor	[Motor and sensor pin allocation (the same)] [Motor and sensor connection diagram (the same)]
M A	Motor	Motor cable type: CC030VPFB See page P.1-213 for details.
M A	Sensor	[Pin allocation (Sensor)] [Connector diagram (Sensor)]
P A	Motor	Motor cable type: CC030VA2R2 See page P.1-212 for details.
P A	Sensor	[Pin allocation (Sensor)] [Connector diagram (Sensor)]

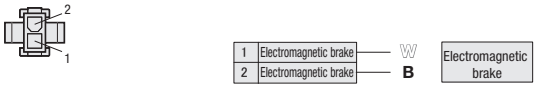


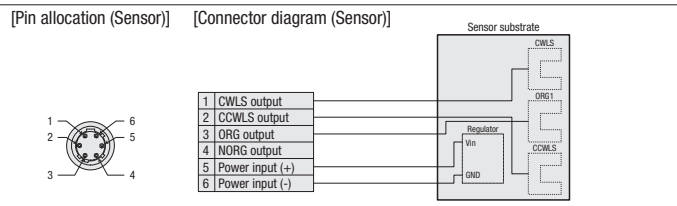
* Please select other side cable from the cable option.

Cable for motor (3m)

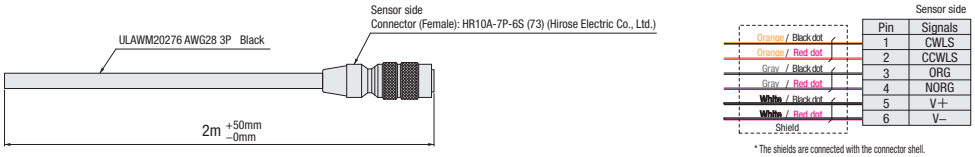


Electromagnetic brake cable (3m)



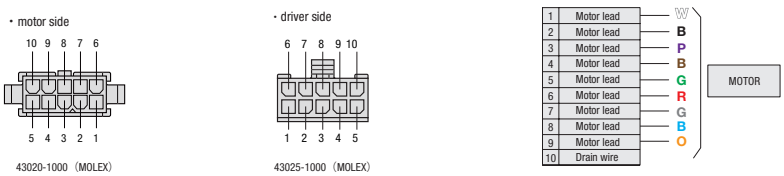


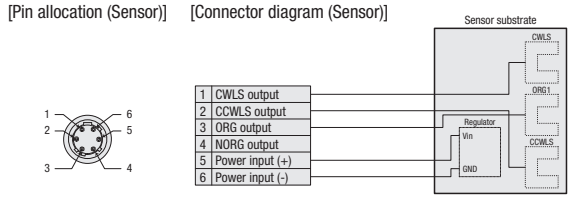
* Model number of other side cable: HR10AP-S-SB-6-2 See page P.1-214 for details.



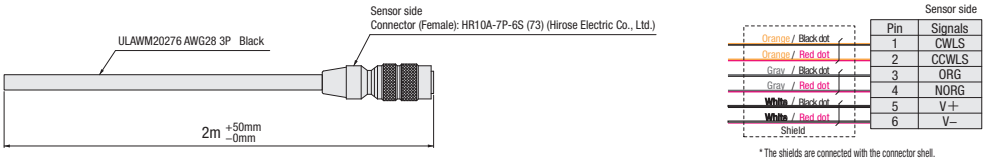
* The shields are connected with the connector shell.

Cable for motor (3m)





* Model number of other side cable: HR10AP-S-SB-6-2 See page P.1-214 for details.

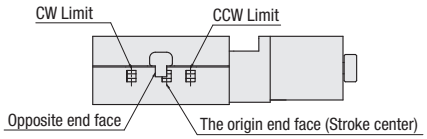


* The shields are connected with the connector shell.

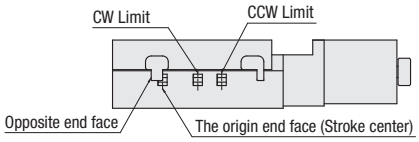
Electrical Specification: KXG06020/KXG06030

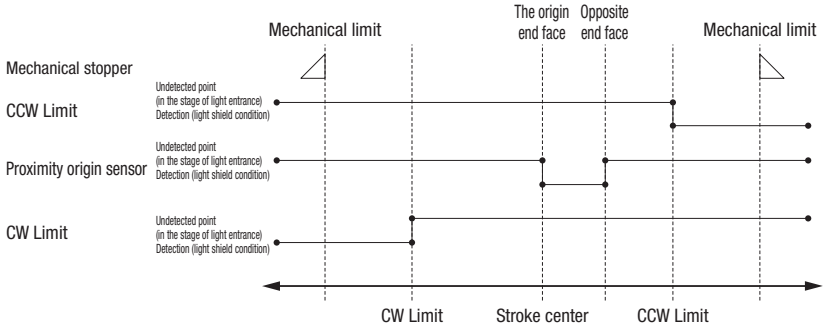
Timing chart

KXG06020



KXG06030





Unit [mm] Direction of CW ◄——► Direction of CCW

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

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

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.

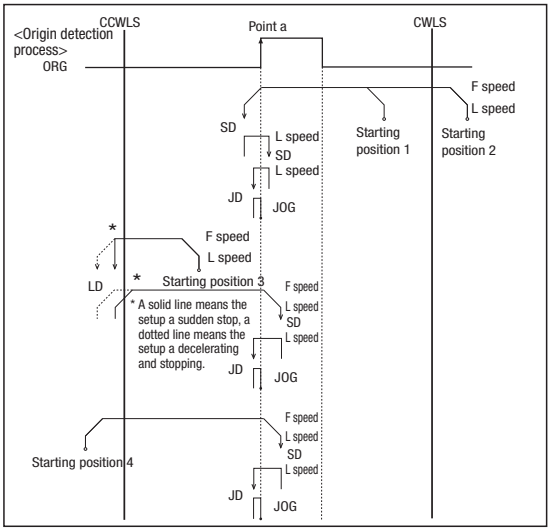
Return to origin method

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

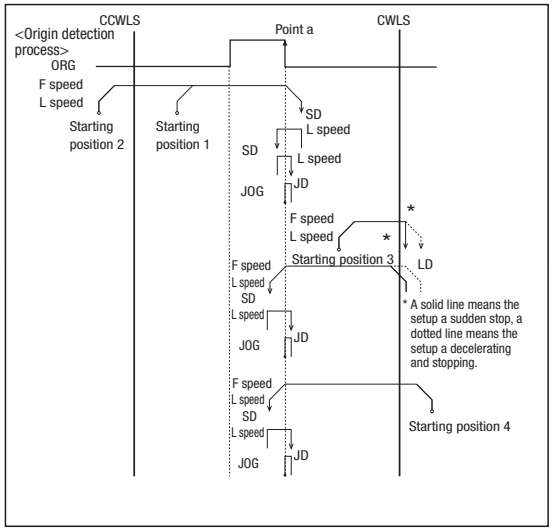
■KXG06020/KXG06030 recommended return to origin　Return to origin sequence ▶P.1-201～

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

[Type3]



[Type4]



Adaptive driver

■ **Driver** ▶P.1-205～

DC24 type input

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

AC100V input

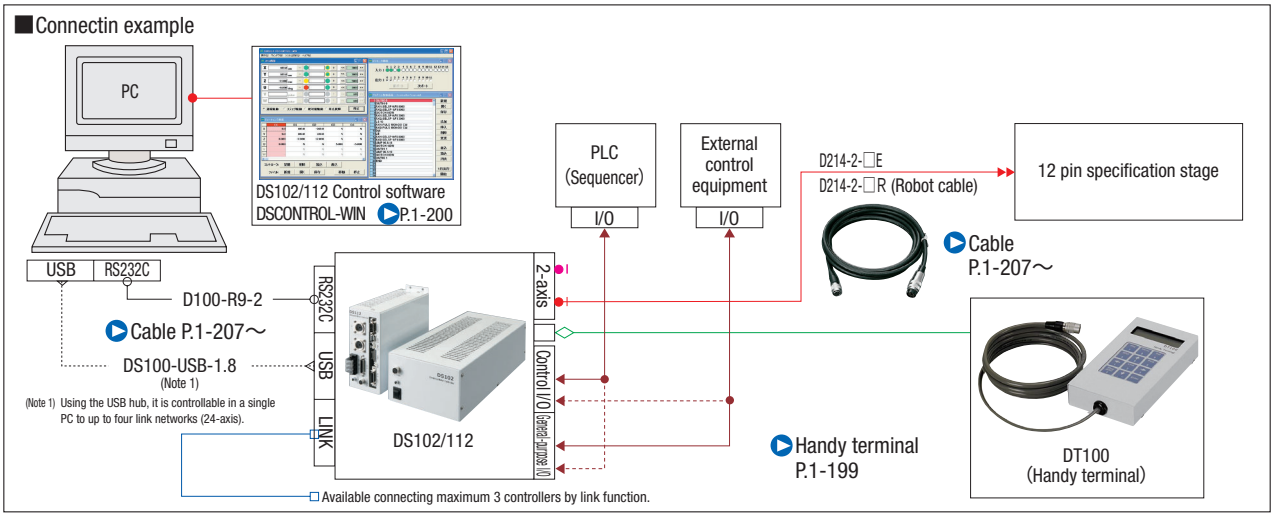
Model	RKD507-A
Divisions	1～1/250 (16 steps)

Adaptive stepping motor controller

■ Controller ▶P.1-197～

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

■Connectin example



KGW series

SURUGA SEIKI

Goniometer Stage □40: KGW04/KAW04

■1-axis
KGW04040 (KGW04 series)

■2-axis
KAW04040 (KAW04 series)

Freely customize the motor

RoHS

Can be used for KGW
See page P.009

Model: K | Selection code: GW04040- | Option code: □ □
1 2 3 4 5

■Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.
■Configuration 2-axis
Combination of 1-axis stage that is different center of rotation.

Cable P.1-207～
Electrical specification P.1-151～

1 Axis

G	1-axis
A	2-axis

2 Table size

04	□40mm

3 Height of center rotation (W.D)

040	40mm
060	60mm

* 2-axis [A] is available for only 040.

4 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

5 Cable option

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

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

Selection Example

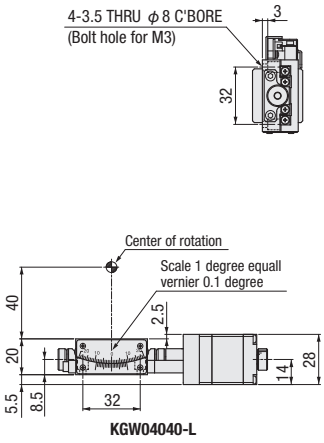
Your spec	Number of axis	+	Height of center rotation (W.D)	+	Sensor cover location	+	Attached cable	▷ KGW04060-L
	1-axis		60mm		L position		Without cable	

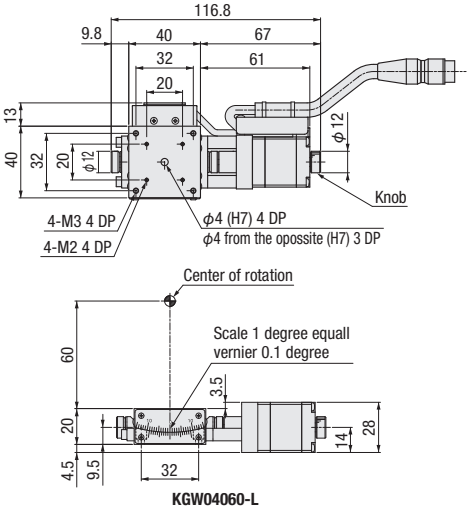
SPEC					
Number of axis		1-axis			2-axis
Model		KGW04040-L		KGW04060-L	KAW04040-L
(Opposite hand)		KGW04040-R		KGW04060-R	KAW04040-R
Mechanical specification	Travel length Upper/Lower axis	±8°		±6°	±8°/±6°
	Table size	40×40mm			
	Travel mechanism	Worm gear (1/240)			
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum-Black alumite、Phosphor bronze-Black coating finish			
	Weight	0.4kg			0.8kg
Dimensional tolerance	Height of stage	20±0.2mm			40±0.4mm
	Height of center rotation	40±0.2mm		60±0.2mm	40±0.4mm
	Runout accuracy of center rotation	Within 0.01mm			—
Accuracy specification	Resolution/Pulse	0.003° (Full)			
	MAX speed Upper / Lower	15°/sec [5kHz]			
	Repeatability positioning accuracy	Within ±0.005°			
	Load capacity	3kgf [29.4N]			2.5kgf [24.5N]
	Moment stiffness	Pitch 1.30/yaw 1.16/roll 0.27 [″/N・cm]			Pitch 1.57/yaw 2.32/roll 1.57 [″/N・cm]
	Lost motion	Within 0.01°			
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	–			
Provided screw (Hexagon-headed bolt)		4 of M3—6			

SURUGA SEIKI CAD 3D·2D

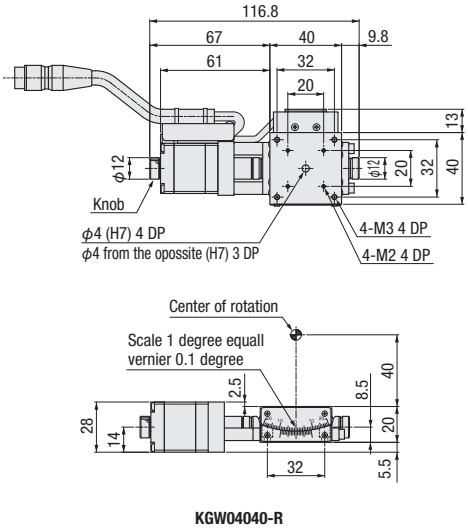
Dimensional outline drawings

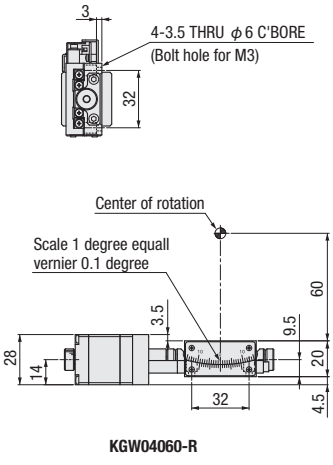
KGW04-L series





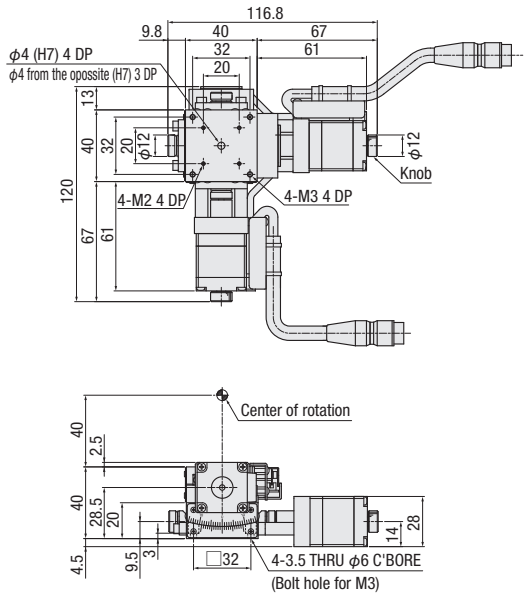
KGW04-R series



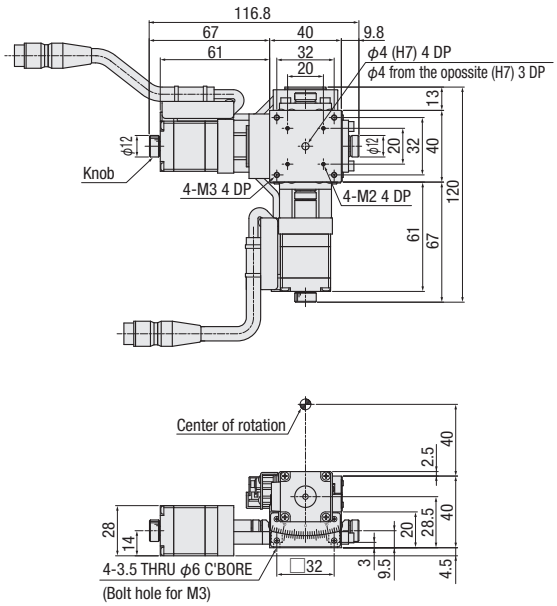


Dimensional outline drawings

KAW04040-L



KAW04040-R



Electrical Specification: KGW04/KAW04

Electrical specification

Model		KGW04040-L	KGW04060-L
Opposite hand		KGW04040-R	KGW04060-R
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)	
	Model (*2)	C005C-90215P-1	
	Step angle	0.72°	
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Slit origin sensor	–	
	Model	Photo microsensor EE-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.

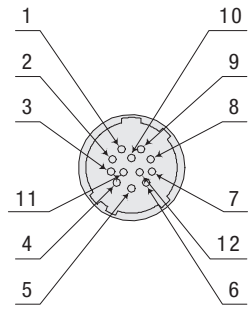
This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

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

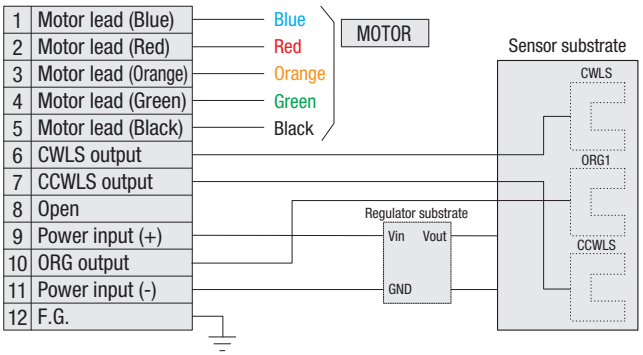
Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS501-40, -60 and amplifier substrates will be replaced with KGW04 and 06 stages.
We have avariety of harness that can be jumped between input and ou tput connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

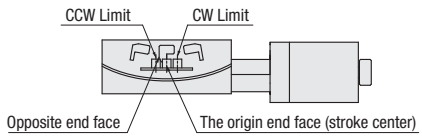
Pin allocation

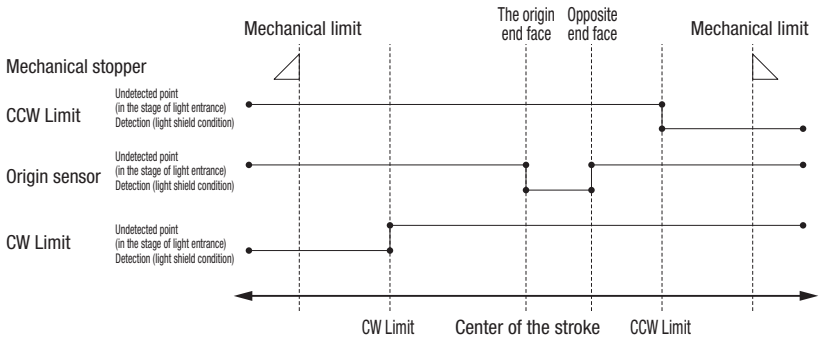


Connection diagram



Timing chart





Unit [deg.] Direction of CW ◀——▶ Direction of CCW

	Reference coordinate	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit
KGW04040	Return to origin	8.5	0	2.5	8.5
KGW04060	Return to origin	6.5	0	2.1	6.5

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

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

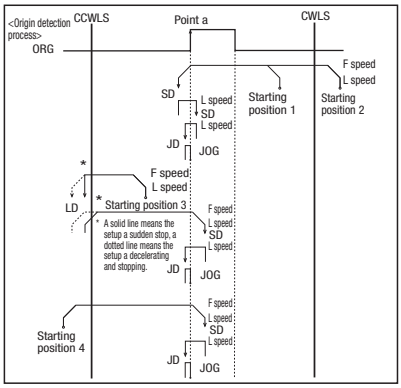
Method for return to origin

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

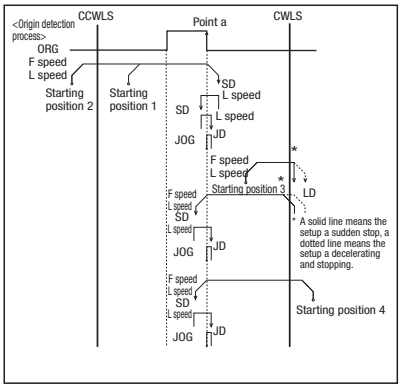
■KGW04/KAW04 recommended return to origin　Return to origin sequence　P.1-201～

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

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



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



Adaptive driver

■ Driver　1-205～

DC24 type input

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

AC100V input

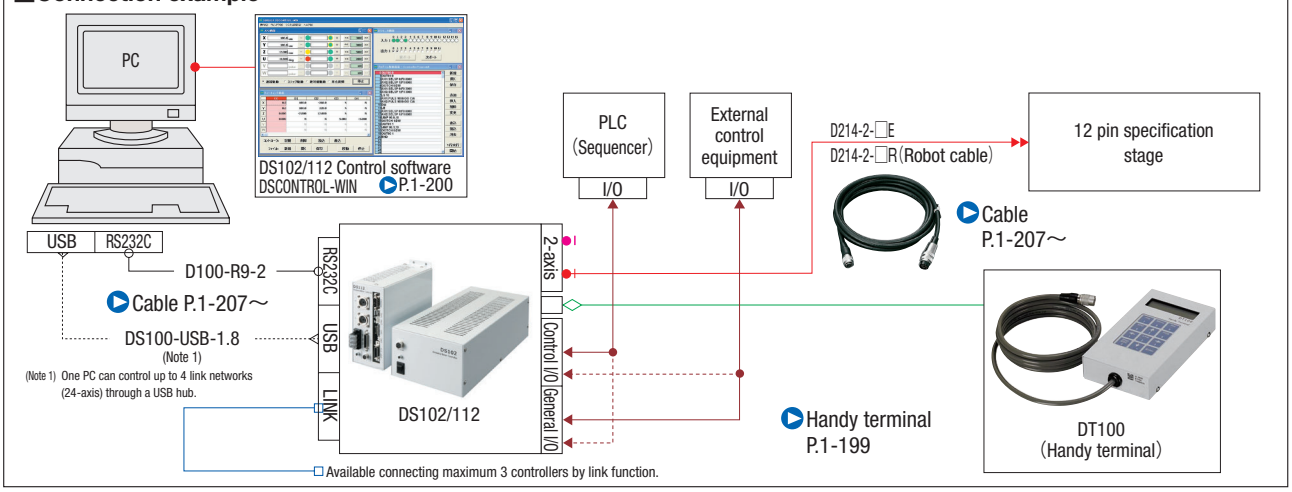
Model	RKD507-A
Divisions	1～1/250 (16 steps)

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



Goniometer Stage □60: KGW06 (1-axis)

■1-axis
KGW06050 (KGW06 series)

Freely customize the motor

RoHS

See page P.009

Model: KGW 06050- □ □
Selection code: 1 2
Option code: 3 4

■Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.

Cable P.1-207～
Electrical specification P.1-161～

1 Table size

06	□60mm

2 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm
125	125mm

3 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

4 Cable option

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

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

Selection Example

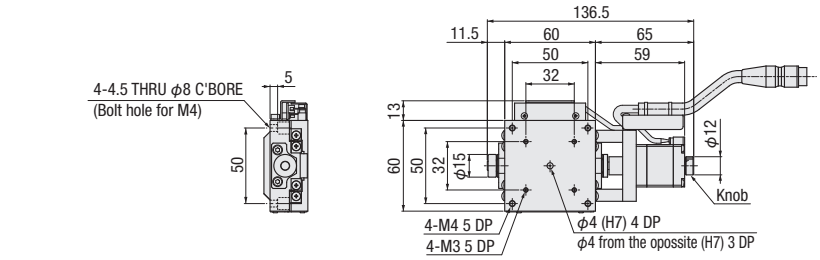
Your spec	Number of axis	+	Height of center rotation (W.D)	+	Sensor cover location	+	Attached cable	▷ KGW06050-RH
	1-axis		50mm		Opposite hand		Robot cable 4m	

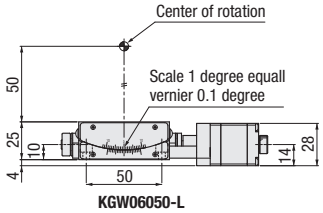
SPEC					
Number of axis		1-axis			
Model		KGW06050-L	KGW06075-L	KGW06100-L	KGW06125-L
(Opposite hand)		KGW06050-R	KGW06075-R	KGW06100-R	KGW06125-R
Mechanical specification	Travel length	±10°	±8°	±6°	±5°
	Table size	60×60mm			
	Travel mechanism (Reduction ratio)	Worm gear (1/160)	Worm gear (1/225)	Worm gear (1/292)	Worm gear (1/360)
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum–Black almite finishing			
	Weight	0.5kg			
Dimensional tolerance	Height of stage	25±0.2mm			
	Height of center rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm
	Runout accuracy of center rotation	Within 0.01mm			
Accuracy specification	Resolution/Pulse	0.0045° (Full)	0.0032° (Full)	0.002466° (Full)	0.002° (Full)
	MAX speed	22.5°/sec [5kHz]	16°/sec [5kHz]	12.5°/sec [5kHz]	10°/sec [5kHz]
	Repeatability positioning accuracy	Within ±0.003°			
	Load capacity	5kgf [49N]			
	Moment stiffness	Pitch 0.30/yaw 0.10/roll 0.11 [″/N・cm]			
	Lost motion	Within 0.01°			
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	–			
Provided screw (Hexagon-headed bolt)		4 of M4—10			

SURUGA SEIKI CAD 3D·2D

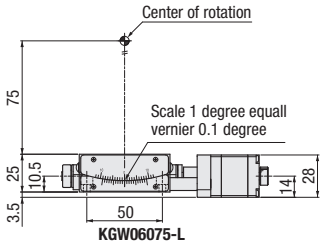
Dimensional outline drawings (1-axis)

KGW06-L series

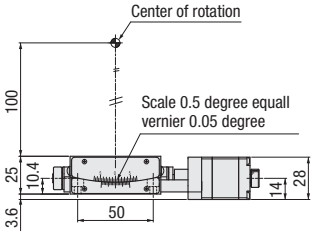




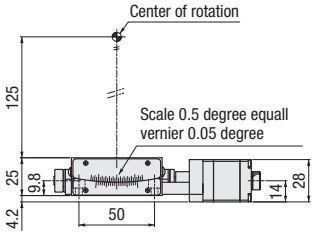
KGW06050-L



KGW06075-L

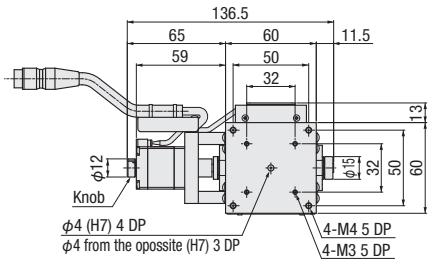


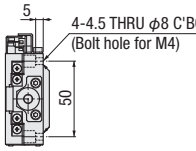
KGW06100-L

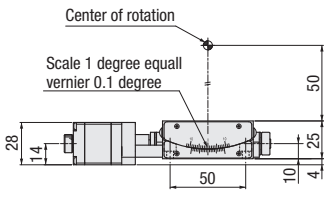


KGW06125-L

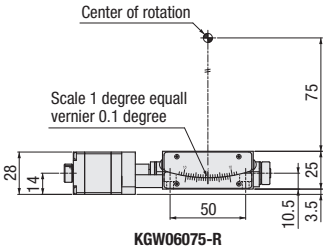
KGW06-R series(Opposite hand)



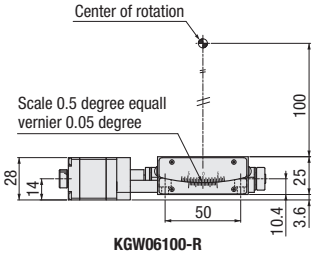




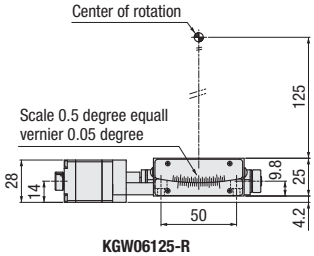
KGW06050-R



KGW06075-R



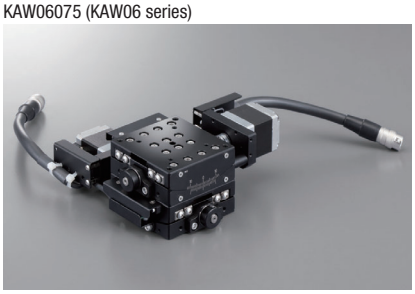
KGW06100-R



KGW06125-R

Goniometer Stage □60: KAW06 (2-axis)

■2-axis
KAW06075 (KAW06 series)



RoHS

Model: KAW | Selection code: 06050 | Option code: - □ □
(1) (2) (3) (4)

■Our high precision goniometer stages based on cross roller guide for travel guide and worm gear mechanism.
■Configuration 2-axis
Combination of 1-axis stage that is different center of rotation.

Cable P.1-207～
Electrical specification P.1-161～

1 Table size

06	□60mm

2 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm

3 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

4 Cable option

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

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

Selection Example

Your spec	Number of axis	+	Height of center rotation (W.D)	+	Sensor cover location	+	Attached cable	▷ KAW06100-LB
	2-axis		100mm		L position		2m One end loose	

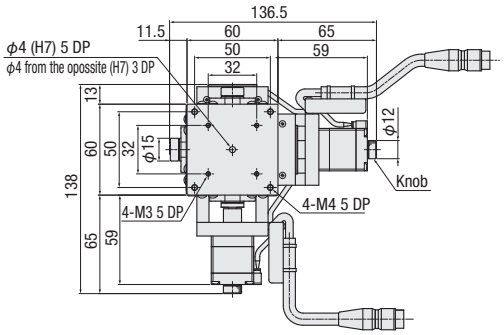
SPEC

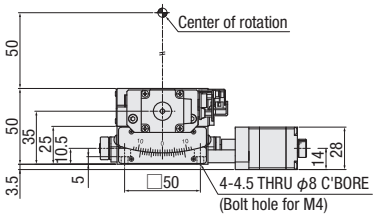
Number of axis			2-axis		
Model			KAW06050-L	KAW06075-L	KAW06100-L
(Opposite hand)			KAW06050-R	KAW06075-R	KAW06100-R
Mechanical specification	Travel length Upper/Lower axis		±10°/±8°	±8°/±6°	±6°/±5°
	Table size		60×60mm		
	Travel mechanism (Reduction ratio)	Upper	Worm gear (1/160)	Worm gear (1/225)	Worm gear (1/292)
		Lower	Worm gear (1/225)	Worm gear (1/292)	Worm gear (1/360)
	Guide		Crossed roller guide		
	Main materials-Finishing		Aluminum–Black almite finishing		
	Weight		1.0kg		
Dimensional tolerance	Height of stage		50±0.4mm		
	Height of center rotation		50±0.4mm	75±0.4mm	100±0.4mm
	Runout accuracy of center rotation		–		
Accuracy specification	Resolution/Pulse	Upper at the full	0.0045°	0.0032°	0.002466°
		Lower at the full	0.0032°	0.002466°	0.002°
	MAX speed	Upper	22.5°/sec [5kHz]	16°/sec [5kHz]	12.5°/sec [5kHz]
		Lower	16°/sec [5kHz]	12.5°/sec [5kHz]	10°/sec [5kHz]
	Repeatability positioning accuracy		Within ±0.003°		
	Load capacity		4.5kgf [44.1N]		
	Moment stiffness		Pitch 0.41/yaw 0.2/roll 0.41 ["/N・cm]		
	Lost motion		Within 0.01°		
Sensor	Limit sensor		Installed		
	Origin sensor		Installed		
	Slit origin sensor		–		
Provided screw (Hexagon-headed bolt)			4 of M4—10		

SURUGA SEIKI CAD 3D·2D

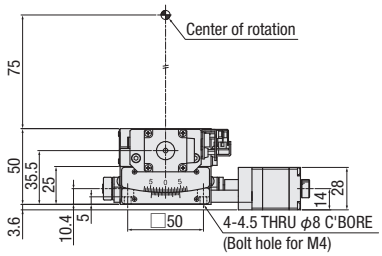
Dimensional outline drawings (2-axis)

KAW06-L series

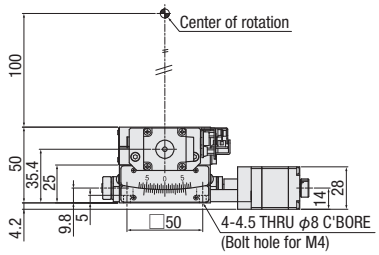




KAW06050-L

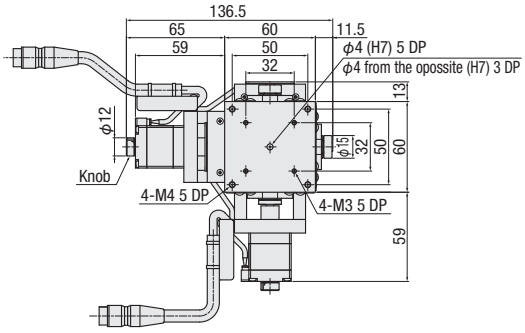


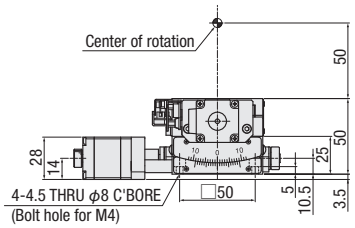
KAW06075-L



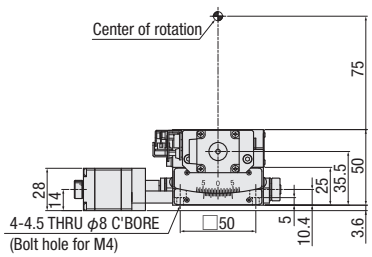
KAW06100-L

KAW06-R series(Opposite hand)

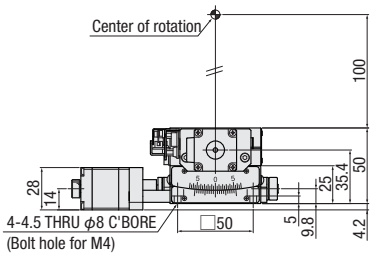




KAW06050-R



KAW06075-R



KAW06100-R

Electrical Specification: KGW06/KAW06

Electrical specification

Model		KGW06050-L	KGW06075-L	KGW06100-L	KGW06125-L
Opposite hand		KGW06050-R	KGW06075-R	KGW06100-R	KGW06125-R
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)			
	Model (*2)	C005C-90215P-1			
	Step angle	0.72°			
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)			
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)			
Sensor	Limit sensor	Installed			
	Origin sensor	Installed			
	Slit origin sensor	–			
	Model	Photo microsensor EE-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.

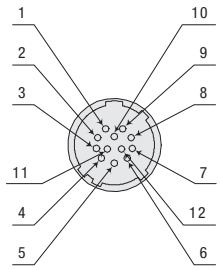
This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

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

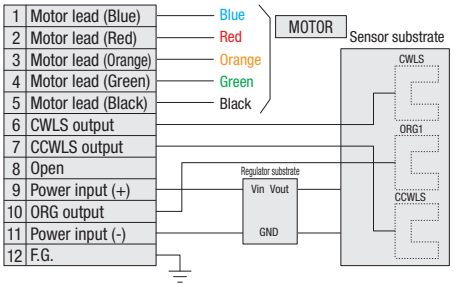
Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS501-40, -60 and amplifier substrates will be replaced with KGW04 and 06 stages.
We have avariety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

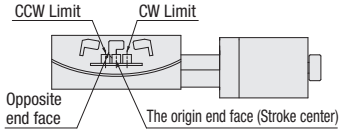
Pin allocation

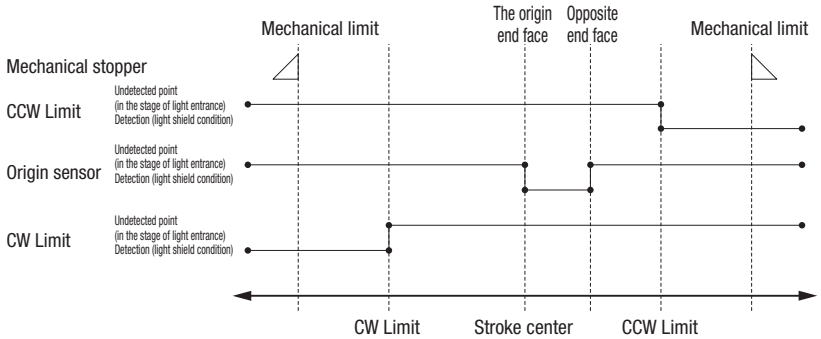


Connection diagram



Timing chart





Unit [deg.] Direction of CW ◄——► Direction of CCW

	Reference coordinate	CW Limit	The origin end face Stroke center	Opposite end face	CCW Limit
KGW06050	Return to origin	10.5	0	2.5	10.5
KGW06075	Return to origin	8.3	0	1.8	8.3
KGW06100	Return to origin	6.3	0	1.4	6.3
KGW06125	Return to origin	5.2	0	1.1	5.2

* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.
* The coordinate is a basis of design value. Dimension error may occur about plus or minus 0.5 deg.
Note: The timing chart shows only timing of sensor, it is not for output signal logic.
Refer to ON/OFF display of output transistor that shows on electrical specifications-sensor-output logic for output signal logic.

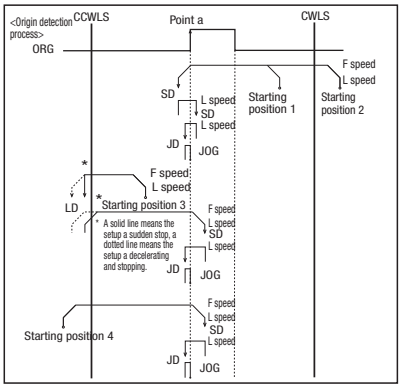
Method for return to origin

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

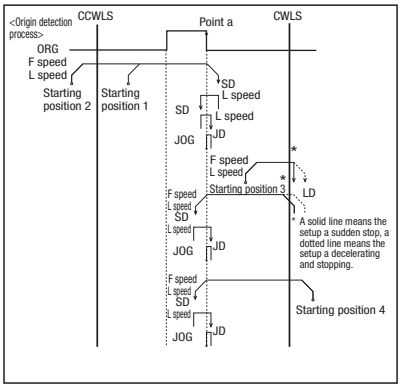
■KGW06/KAW06 recommended return to origin　Return to origin sequence　P.1-201～

Type 3: Detect in the direction of CCW and perform detected process for CCW edge(a point) of ORG signal.
Type 4: Detect in the direction of CW and perform detected process for CW edge of ORG signal.
Type 9: After finished Type3, perform detected process for CCW edge of TIMING signal.
Type10: After finished Type4, perform detected process for CW edge of TIMING signal.

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



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



Adaptive driver

■ Driver P.1-205～

DC24 type input

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

AC100V input

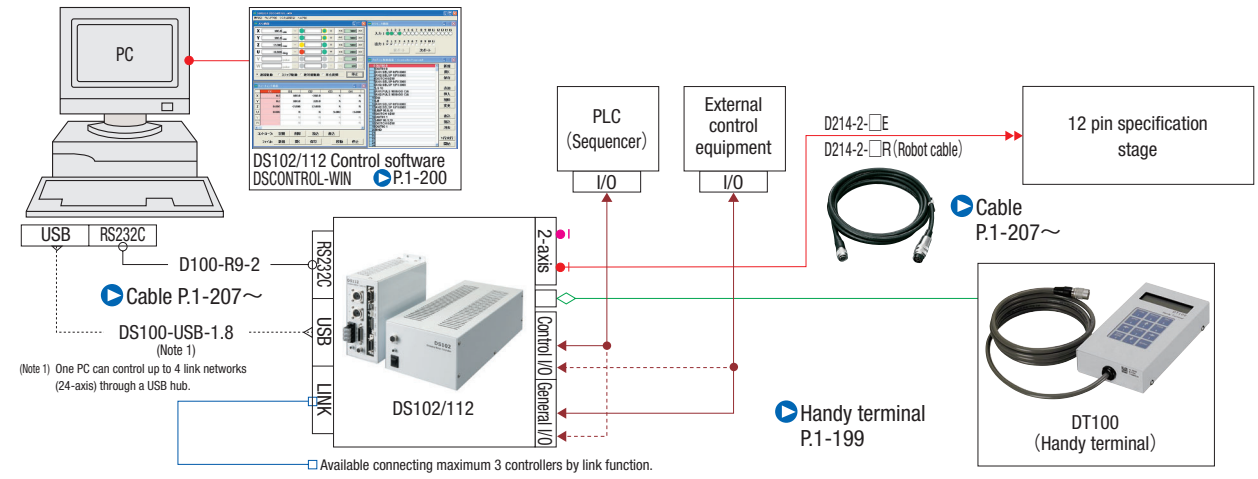
Model	RKD507-A
Divisions	1～1/250 (16 steps)

Adaptive stepping motor controller

■ Controller P.1-197～

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

■Connection example



KRW series

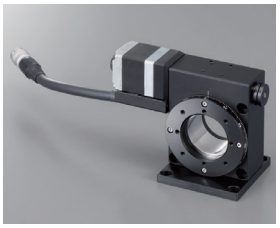
SURUGA SEIKI

Rotary Stage ϕ39/ϕ59: KRW04/KRW06

KRW04360

KRW06360C

KRW06360C-Z

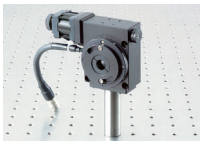


Freely customize the motor

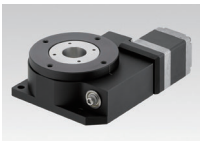
RoHS

See page P.009

■Available for motorized polarizer with adaptor.
FPW06360C P.3-103



■Low price motorized rotation stage KRE series line up
P.1-177～



Model: **KRW** | Selection code: **04360-** | Option code: □□ (3 4)

■**Good for accuracy possitioning at wide angle and 360°continuously rotation.**
■**Vertical type can be used as a cable organization and polarizing elements rotation.**

Cable P.1-207～
Electrical specification P.1-175～

1 Table size

04	ϕ39mm
06	ϕ59mm

2 Travel length

360	360°

※Table size code 06: 360C

3 Mounting

Code	Specification
Blank	Horizon
Z	Vertical

* Z is only for KRW06.

4 Cable option

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

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

Selection Example

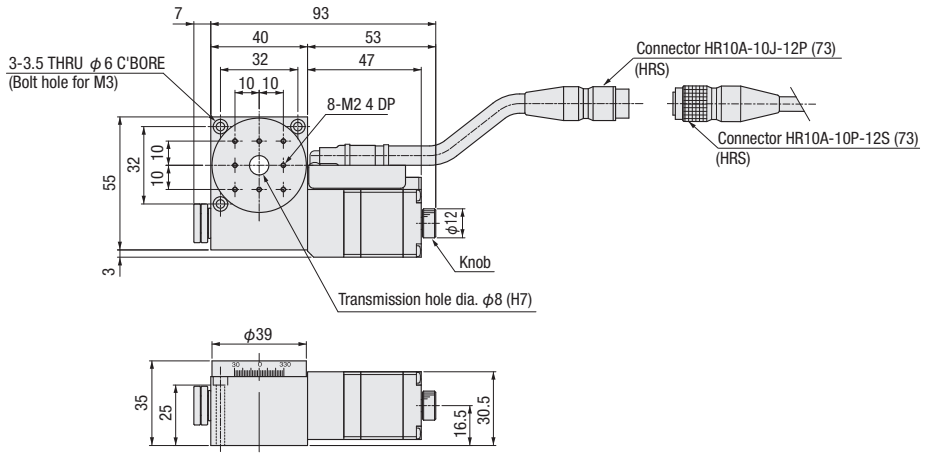
Your spec	Table size	+	Attached cable	▷ KRW06360C-D
	ϕ59mm		4m one end loose	

SPEC

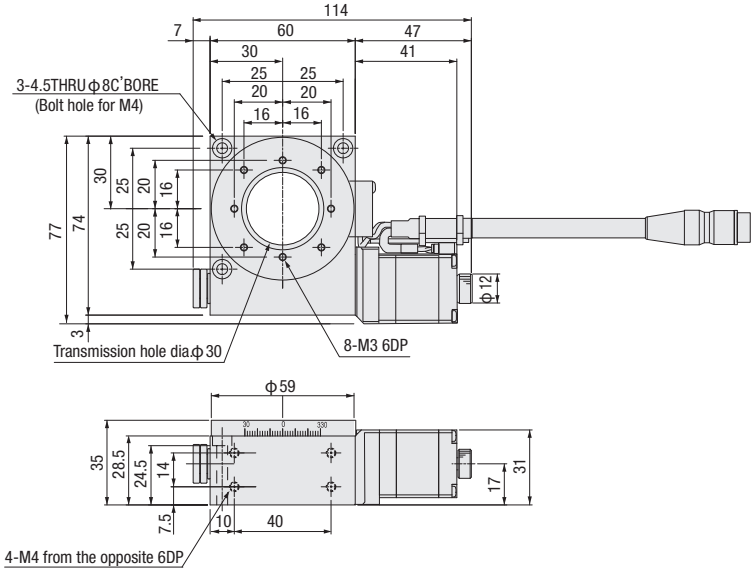
Model		KRW04360	KRW06360C	KRW06360C-Z
Mechanical specification	Travel length	360°		
	Table size	ϕ39mm	ϕ59mm	
	Travel mechanism (Reduction ratio)	Worm gear (Reduction ratio 1/120)	Worm gear (Reduction ratio 1/180)	
	Guide	Deep groove ball bearing		
	Main materials-Finishing	Aluminum–Black almite finishing		
	Weight	0.4kg	0.6kg	0.7kg
Accuracy specification	Resolution/Pulse	0.006° (Full)	0.004° (Full)	
	MAX speed	30°/sec [5kHz]	20°/sec [5kHz]	
	Positioning accuracy	0.05°		
	Repeatability positioning accuracy	±0.01°		
	Load capacity	3.0kgf [29.4N]		1.0kgf [9.8N]
	Moment stiffness	0.74″/N・cm	0.2″/N・cm	
	Lost motion	0.05°		
	Backlash	0.1degree	0.05°	
	Parallelism	50μm		
	Eccentricity	5μm		
	Runout	30μm		
Sensor	Limit sensor	—		
	Origin sensor	Installed		
	Slit origin sensor	—		
Provided screw (Hexagon-headed bolt)		3 of M3－30	3 of M4－30	4 of M4－6

Dimensional outline drawings

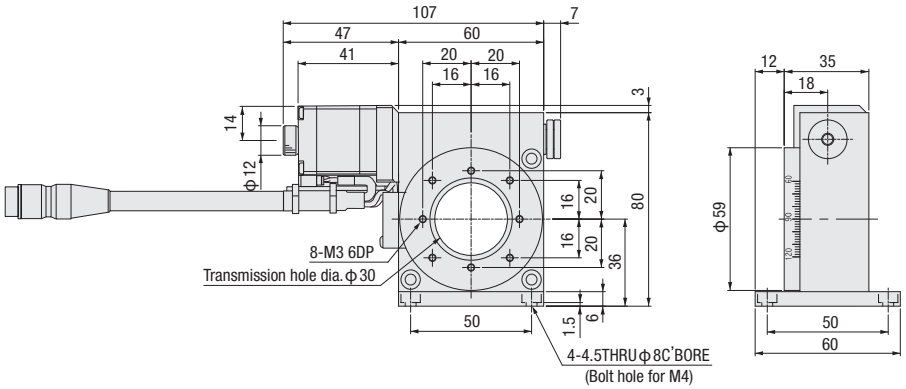
KRW04360



KRW06360C



KRW06360C-Z



Electrical Specification: KRW04/KRW06

Electrical specification

Models		KRW04360	KRW06360C	KRW06360C-Z
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)		
	Model (*2)	C005C-90215P-1		
	Step angle	0.72°		
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)		
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)		
Sensor	Limit sensor	–		
	Origin sensor	Installed		
	Slit origin sensor	–		
	Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)		
	Power voltage	DC5～24V ±10%		
	Consumption current	Total 35mA or less		
	Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA		
	Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)		

*1 See page P.1-213~ for details of single motor specification. *2 Model is our own management model.

Available sensor DC5V~24V.

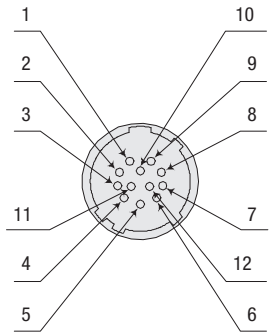
This stages have DC5V~24V correspondence sensor. 24V correspondence sensor amplifier substrateK-PCBA24 is not necessary.

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

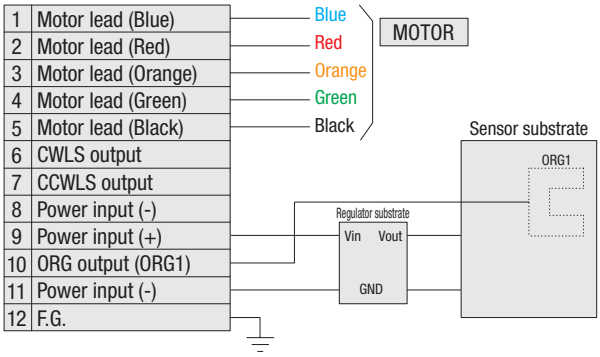
Note

Must be wired without sensor amplifier substrate when our customer who uses the former stages KS401-40, -60, KS431-60 and amplifier substrates will be replaced with KRW stages.
We have avariety of harness that can be jumped between input and output connector of sensor amplifier substrate for taking advantage of existing cables that using sensor amplifier substrate.

Pin allocation



Connection diagram



Timing chart

KRW04360/KRW06360C
Origin • • • Detect in scale 0 (Dark)
(Return to origin is performed type 4 of returning origin by use of DS102/DS112 controller)

	Origin detected scale position [°]
KRW04360	0 (The end face of the origin: The end face of the origin:CCW side edge of shield plate) 11 (Opposite end face : Opposite side of the end face: CW side edge of shield plate)
KRW06360C	0 (The end face of the origin: The end face of the origin:CCW side edge of shield plate) 9 (Opposite end face : Opposite side of the end face: CW side edge of shield plate)

Note: The direction of CW/CCW in timing chart shows motor rotation. Upper plate rotation in CW as below.
KRW04360: CW KRW06360: CW

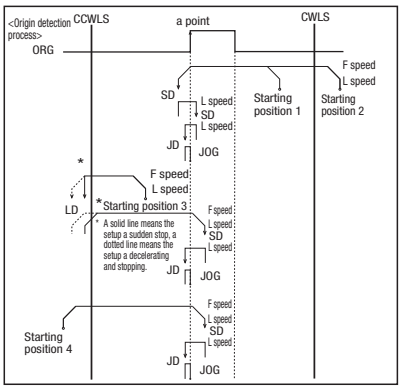
Method for return to origin

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

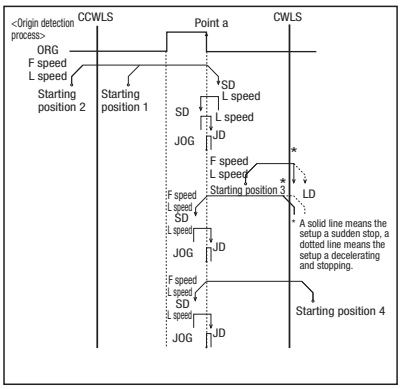
■KRW04360/KRW06360C recommended return to origin　Return to origin sequence　P.1-201～

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

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



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



Adaptive driver

■ Driver P.1-205～

DC24 type input

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

AC100V input

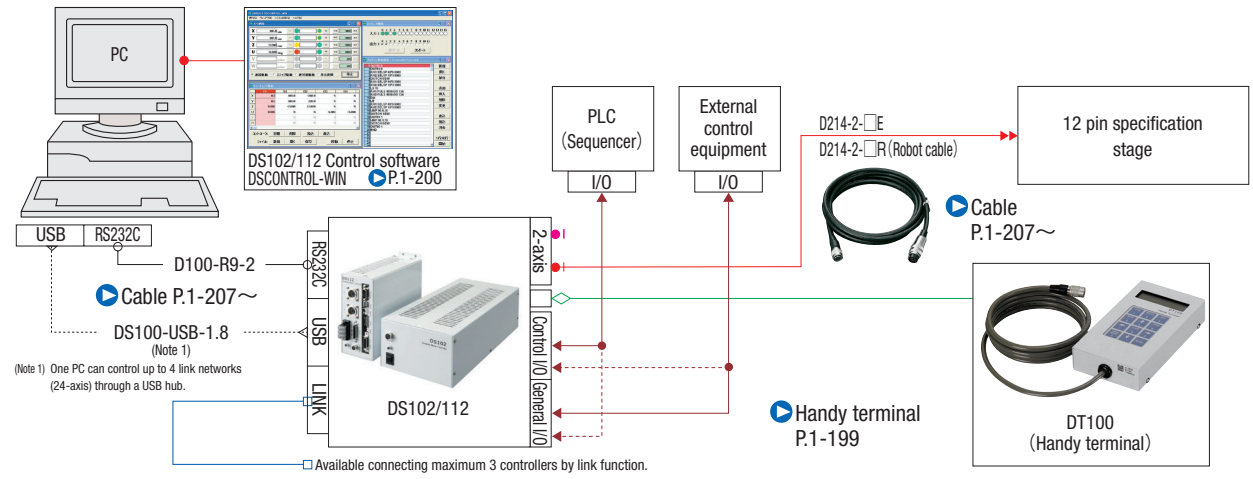
Model	RKD507-A
Divisions	1～1/250 (16 steps)

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

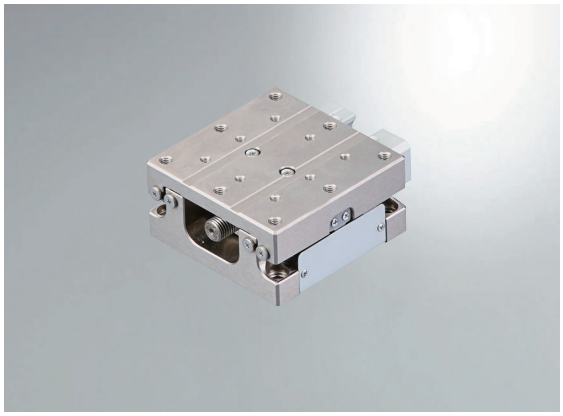
■Connection example



Motorless

SURUGA SEIKI

X-axis Linear Ball Guide：KXG06020V



accessories		P28	S38	S40
■Motor bracket (installed on main body)			○	
■Motor Plate		○	-	-
■Coupling (with screws)			○	
■Screws	For Motor	4 of M2.5-10	4 of M3-12	2 of M4-12
	For Motor Plate	4 of M3-6	-	-
	For Main Body		4 of M4-12	
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)	
■cable tie		○	-	-

Model　　Option code

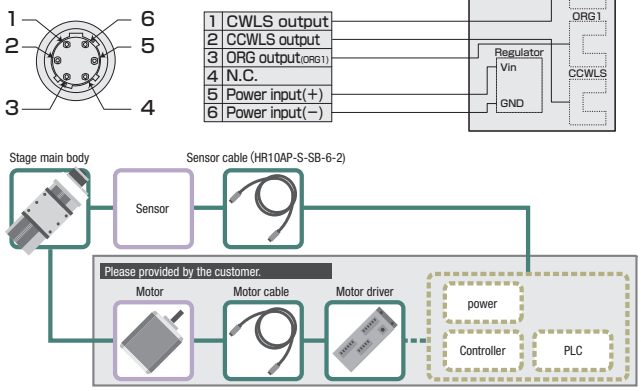
KXG06020V-P28

1

1 Application Motor

Code	Specification
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)

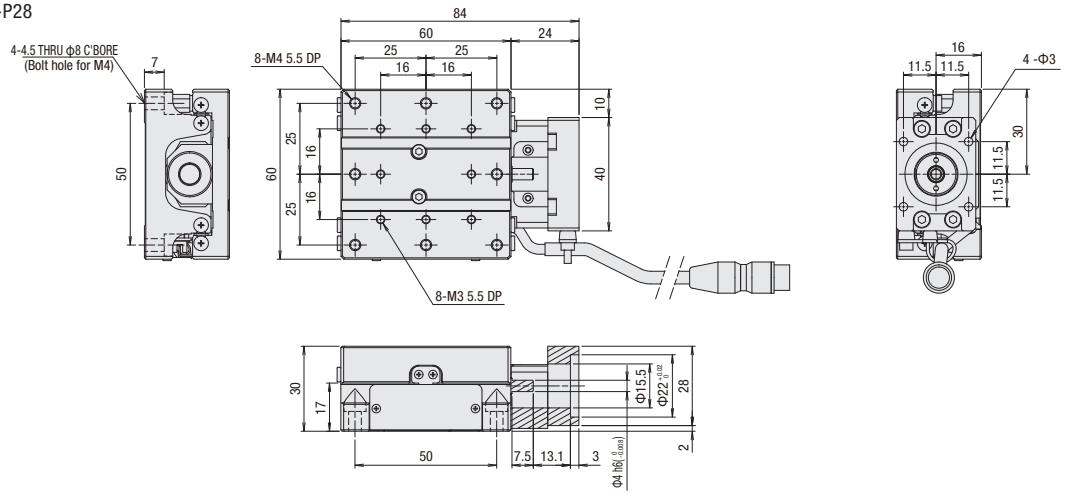


SPEC					
Model			KXG06020V-P28	KXG06020V-S38	KXG06020V-S40
Mechanical specification	Travel length		20mm		
	Table size		60×60mm		
	Feed screw (Ball screw)		ϕ8 lead 1		
	Guide		Linear ball guide		
	Main materials-Finishing		Stainless-Electroless nickel plating		
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm		
		Microstep	0.1μm (1/20 on resolution)		
	MAX speed		20mm/sec		
	Uni-directional positioning accuracy		5μm		
	Repeatability positioning accuracy		±0.5μm		
	Load capacity		5kgf【49N】		
	Moment stiffness		Pitch 0.08/yaw 0.05/roll 0.05 [″/N・cm]		
	Lost motion		1μm		
	Backlash		1μm		
	Straightness		3μm		
	Parallelism		15μm		
	Motion parallelism		10μm		
	Pitching/Yawing		20″/15″		

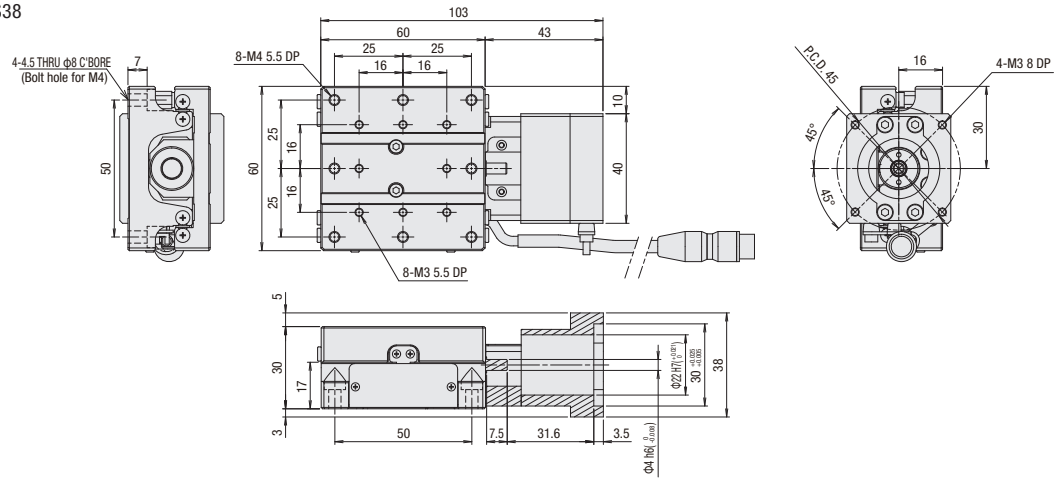
SENSOR	
Limit sensor	Installed
Origin sensor	Installed
Slit origin sensor	–
Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)
Power voltage	DC5～24V　±10%
Consumption current	Total 60mA or less
Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)

※SPEC is reference for the standard model

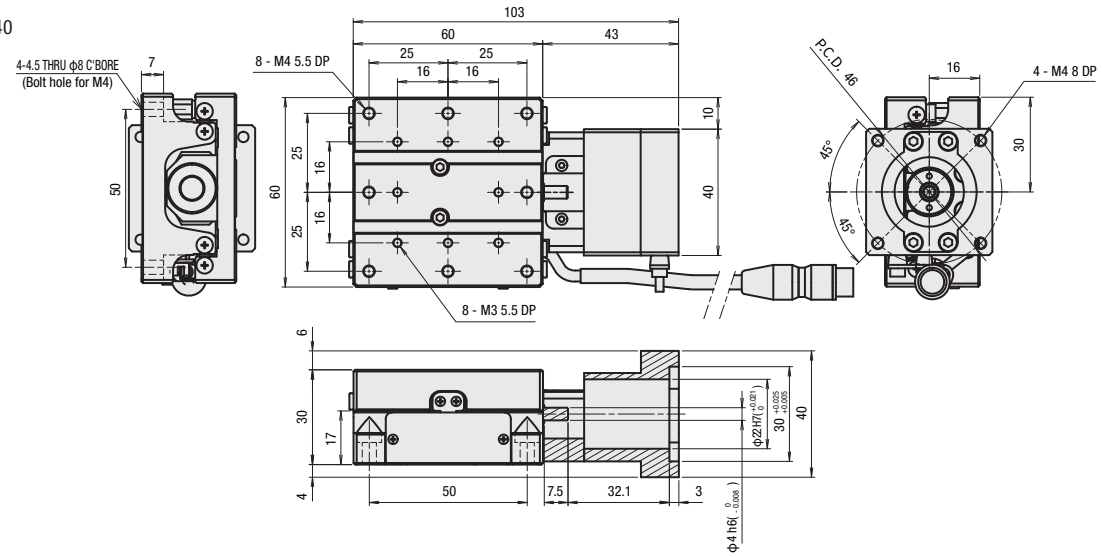
KXG06020V-P28



KXG06020V-S38



KXG06020V-S40



【In order to avoid damaging the motor-less product, please take the following precautions when handling them.】

◆Guarantee range

In difference to a conventional product, the guarantee range of the motor-less product will be limited due to no driving source, and notice the following attentions.

- Defect or trouble, according to motor mounting adjustment is not covered under the warranty.
- The accuracy assumes a motor test result for our inspection a guarantee level, and the accuracy after the motor mounting by the customer should be the guarantee outside.

◆Precautions and restricts on using

1.As load capacity and maximum speed depend on configuration of stage main body, please refrain from the use exceed the spec.
As distance is short between limit sensor and mechanical limit, collision with mechanical limit will incur due to over-run.
Please make sure the frequent repetition collision, it may adversely affect stage accuracy and rigidity.

2.The use with the high torque motor may give load more than the stage permission.
Please use for under 0.25N・m product or under the torque limit.

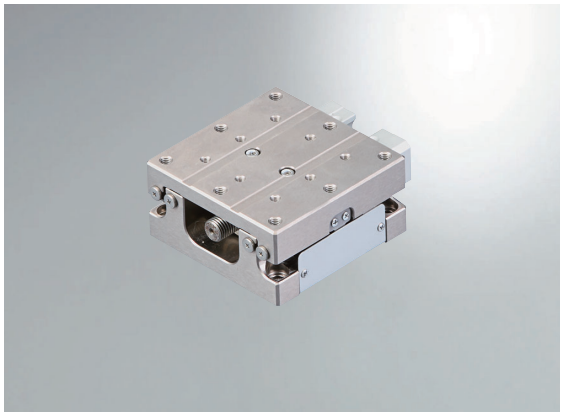
3. Very careful centering is required especially when a main body, motor and coupling is applied.
The operation that not enough centering may cause the damage or deterioration of the product early.
Please see the attached operating and assembly sheet for mounting adjustment.

4. Some products may need fixing part of the connector on your side.
Disconnection may occur before fixation due to a connector and the main body is connected only with lead. Please handle with care.

◆At the time of purchase

When placing an order, please be sure the above-mentioned, and on the premise of agreeing with guarantee coverage and attention / limitation items.

X-axis Linear Ball Guide :KXG06030V



accessories		P28	S38	S40
■Motor bracket (installed on main body)		○		
■Motor Plate		○	-	-
■Coupling (with screws)		○		
■Screws	For Motor	4 of M2.5-10	4 of M3-12	2 of M4-12
	For Motor Plate	4 of M3-6	-	-
	For Main Body	4 of M4-12		
■Sensor cable (2m One end loose)		○(HR10AP-S-SB-6-2)		
■cable tie		○	-	-

Model / Option code

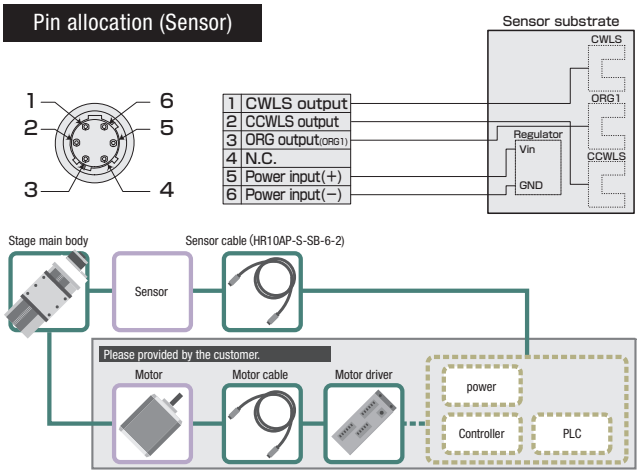
KXG06030V-P28

1

1 Application Motor

Code	Specification
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)

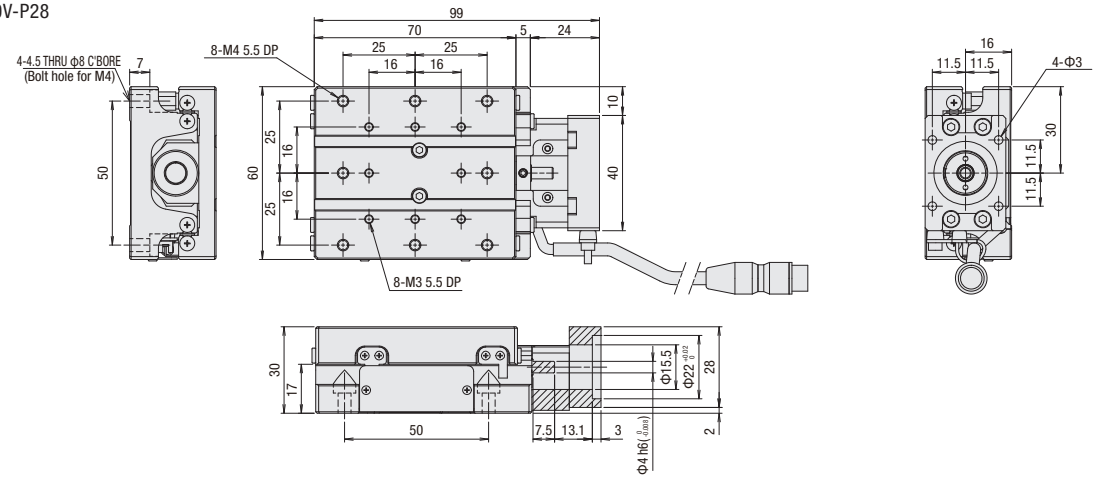


S P E C				
Model		KXG06030V-P28	KXG06030V-S38	KXG06030V-S40
Mechanical specification	Travel length	30mm		
	Table size	60×70mm		
	Feed screw (Ball screw)	ϕ8 lead 1		
	Guide	Linear ball guide		
	Main materials-Finishing	Stainless-Electroless nickel plating		
Accuracy specification	Resolution (Pulse) Full/Half	2μm/1μm		
	Resolution (Pulse) Microstep	0.1μm (1/20 on resolution)		
	MAX speed	20mm/sec		
	Uni-directional positioning accuracy	5μm		
	Repeatability positioning accuracy	±0.5μm		
	Load capacity	5kgf【49N】		
	Moment stiffness	Pitch 0.08/yaw 0.05/roll 0.05 [″/N・cm]		
	Lost motion	1μm		
	Backlash	1μm		
	Straightness	3μm		
	Parallelism	15μm		
	Motion parallelism	10μm		
	Pitching/Yawing	20″/15″		

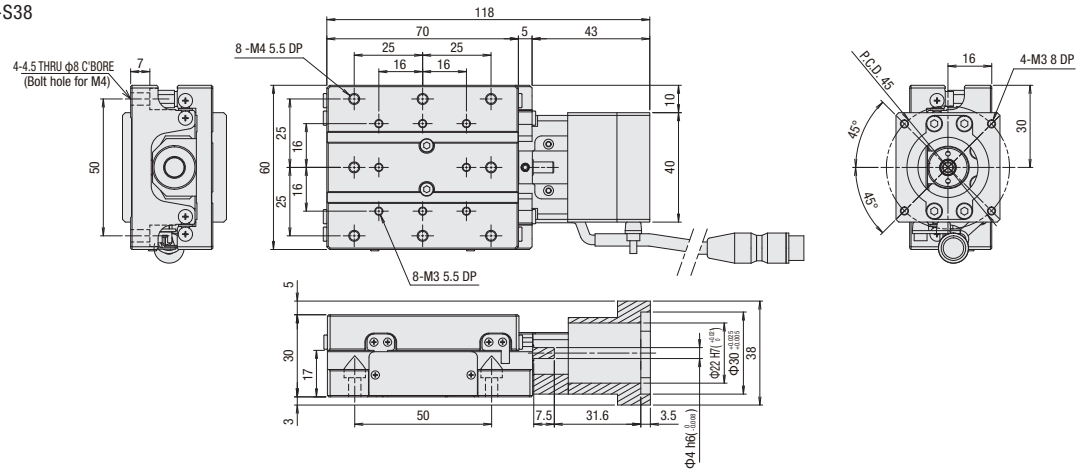
SENSOR	
Limit sensor	Installed
Origin sensor	Installed
Slit origin sensor	–
Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)
Power voltage	DC5～24V ±10%
Consumption current	Total 60mA or less
Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)

※SPEC is reference for the standard model

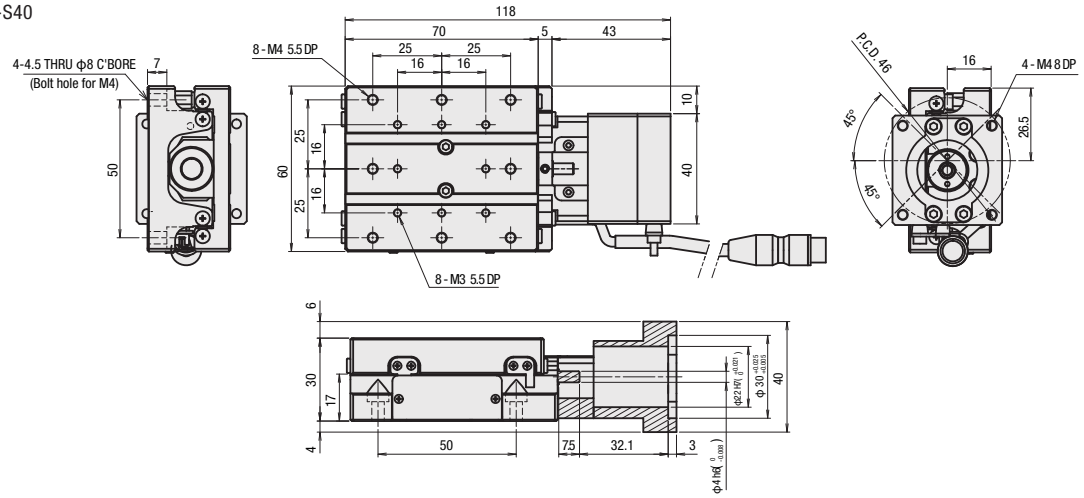
KXG06030V-P28



KXG06030V-S38



KXG06030V-S40



【In order to avoid damaging the motor-less product, please take the following precautions when handling them.】

◆Guarantee range

In difference to a conventional product, the guarantee range of the motor-less product will be limited due to no driving source, and notice the following attentions.

- Defect or trouble, according to motor mounting adjustment is not covered under the warranty.
- The accuracy assumes a motor test result for our inspection a guarantee level, and the accuracy after the motor mounting by the customer should be the guarantee outside.

◆Precautions and restricts on using

1.As load capacity and maximum speed depend on configuration of stage main body, please refrain from the use exceed the spec.
As distance is short between limit sensor and mechanical limit, collision with mechanical limit will incur due to over-run.
Please make sure the frequent repetition collision, it may adversely affect stage accuracy and rigidity.

2.The use with the high torque motor may give load more than the stage permission.
Please use for under 0.25N・m product or under the torque limit.

3. Very careful centering is required especially when a main body, motor and coupling is applied.
The operation that not enough centering may cause the damage or deterioration of the product early.
Please see the attached operating and assembly sheet for mounting adjustment.

4. Some products may need fixing part of the connector on your side.
Disconnection may occur before fixation due to a connector and the main body is connected only with lead. Please handle with care.

◆At the time of purchase

When placing an order, please be sure the above-mentioned, and on the premise of agreeing with guarantee coverage and attention / limitation items.

Goniometer Stage□40：KGW04040V / KGW04060V

accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor	KGW04	2 of M2.5-6	4 of M3-12	2 of M4-12
		KGW06	4 of M2.5-6		
	For Main Body	KGW04	4 of M3-6		
		KGW06	4 of M4-10		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model / Selection code / Option code

KGW04 040V-L -P28

(040V-L: 1 2, P28: 1)

1 Height of center rotation (W.D)

040	40mm
060	60mm

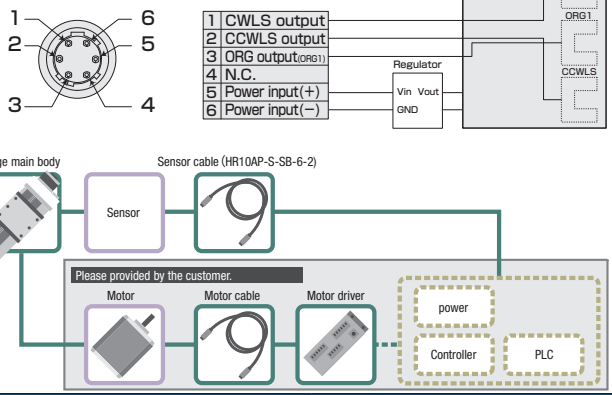
2 Sensor cover location specification

L	L position
R	Opposite hand

1 Application Motor

Code	Specification
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)



SPEC							
Model		KGW04040V-L-P28	KGW04040V-L-S38	KGW04040V-L-S40	KGW04060V-L-P28	KGW04060V-L-S38	KGW04060V-L-S40
Mechanical specification	Travel length	±8°			±6°		
	Table size	40×40mm					
	Travel mechanism	Worm gear (1/240)					
	Guide	Crossed roller guide					
	Main materials-Finishing	Phosphor bronze—Black coating finishing,Aluminum—Black almite finishing					
Dimensional tolerance	Height of stage	20±0.2mm					
	Height of center rotation	40±0.2mm			60±0.2mm		
	Runout accuracy of center rotation	0.01mm					
Accuracy specification	Resolution/Pulse	0.003° (Full)					
	MAX speed	15°/sec [5kHz]					
	Repeatability positioning accuracy	±0.005°					
	Load capacity	3kgf【29.4N】					
	Moment stiffness	Pitch 1.30/yaw 1.16/roll 0.27 [″/N・cm]					
	Lost motion	0.01°					

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)

※SPEC is reference for the standard model

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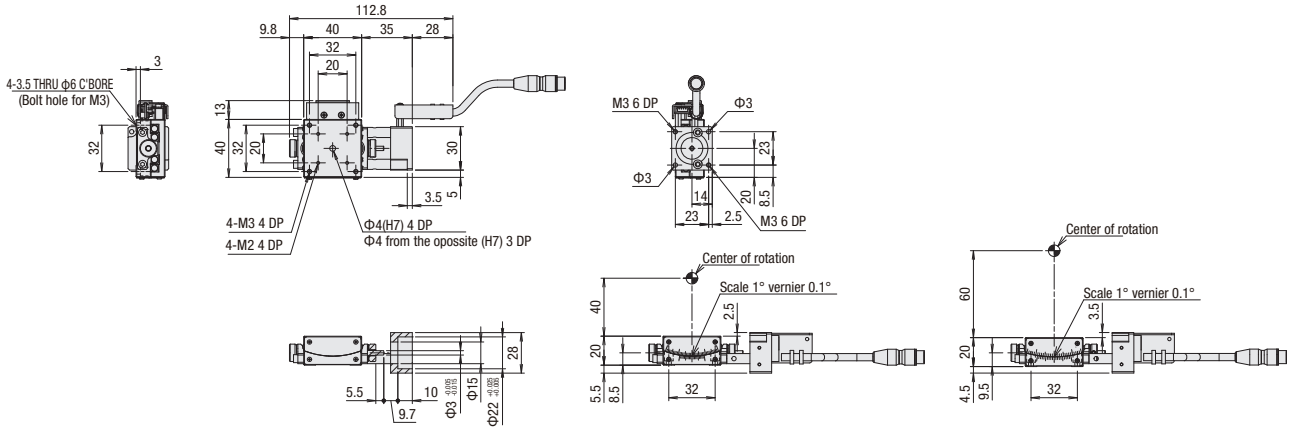
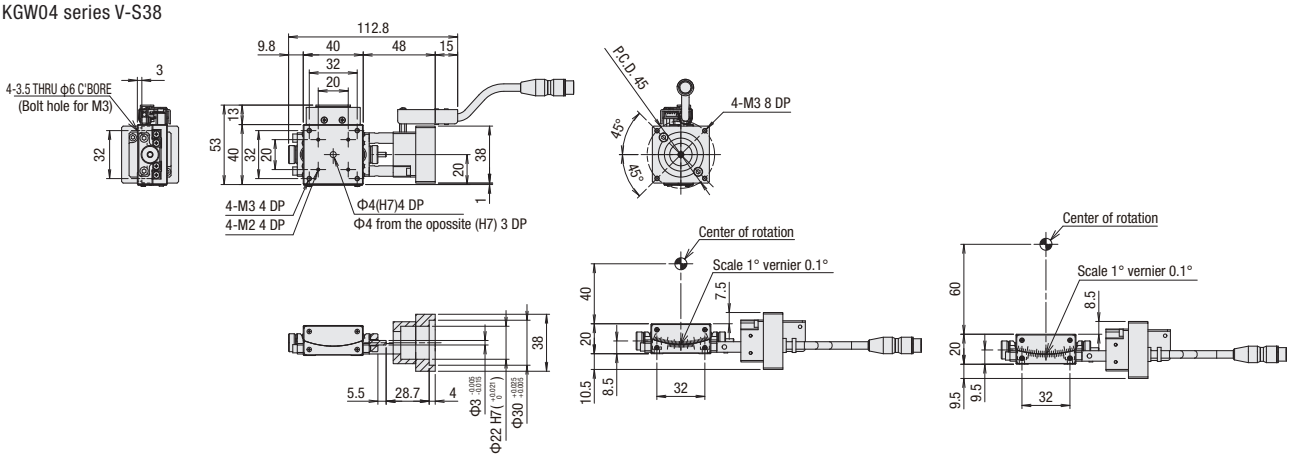
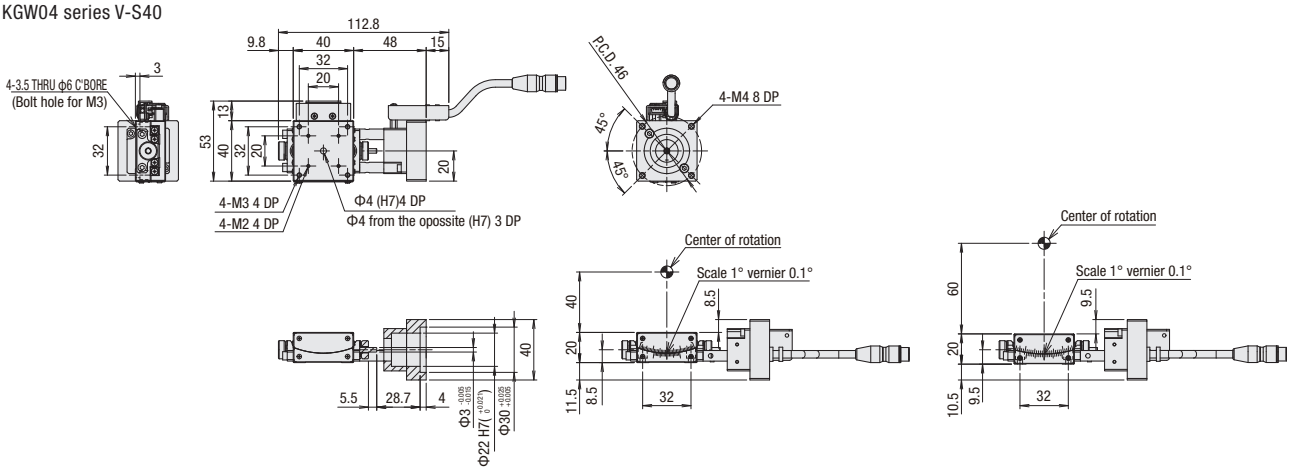
KGW04 series V-P28



KGW04 series V-S38



KGW04 series V-S40



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◆Precautions and restricts on using

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Please make sure the frequent repetition collision, it may adversely affect stage accuracy and rigidity.

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Disconnection may occur before fixation due to a connector and the main body is connected only with lead. Please handle with care.

◆At the time of purchase

When placing an order, please be sure the above-mentioned, and on the premise of agreeing with guarantee coverage and attention / limitation items.

Goniometer Stage□60：KGW06V

accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor	KGW04	2 of M2.5-6	4 of M3-12	2 of M4-12
		KGW06	4 of M2.5-6		
	For Main Body	KGW04	4 of M3- 6		
		KGW06	4 of M4-10		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model / Selection code / Option code

KGW06 050V-L-P28

1 2 1

1 Height of center rotation (W.D)

050	50mm
075	75mm
100	100mm
125	125mm

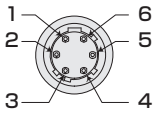
2 Sensor cover location specification

L	L position
R	Opposite hand

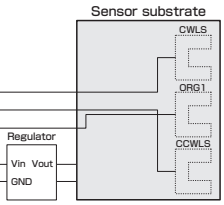
1 Application Motor

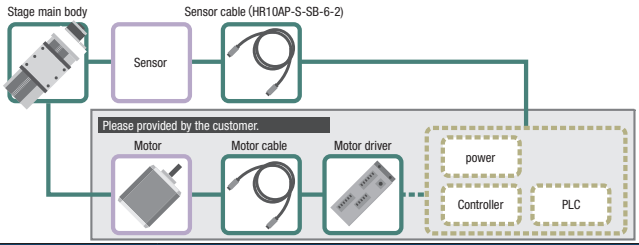
Code	Speci cation
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)



1	CWLS output
2	CCWLS output
3	ORG output(ORG1)
4	N.C.
5	Power input(+)
6	Power input(−)





S P E C					
Model		KGW06050V-L-P28	KGW06075V-L-P28	KGW06100V-L-P28	KGW06125V-L-P28
Mechanical specification	Travel length	±10°	±8°	±6°	±5°
	Table size	60×60mm			
	Travel mechanism (Reduction ratio)	Worm gear (1/160)	Worm gear (1/225)	Worm gear (1/292)	Worm gear (1/360)
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum—Black almite finishing			
Dimensional tolerance	Height of stage	25±0.2mm			
	Height of center rotation	50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm
	Runout accuracy of center rotation	0.01mm			
Accuracy specification	Resolution/Pulse	0.0045° (Full)	0.0032° (Full)	0.002466° (Full)	0.002° (Full)
	MAX speed	22.5°/sec [5kHz]	16°/sec [5kHz]	12.5°/sec [5kHz]	10°/sec [5kHz]
	Repeatability positioning accuracy	±0.003°			
	Load capacity	5kgf【49N】			
	Moment stiffness	Pitch 0.30/yaw 0.10/roll 0.11 [″/N・cm]			
	Lost motion	0.01°			

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)

※SPEC is reference for the standard model

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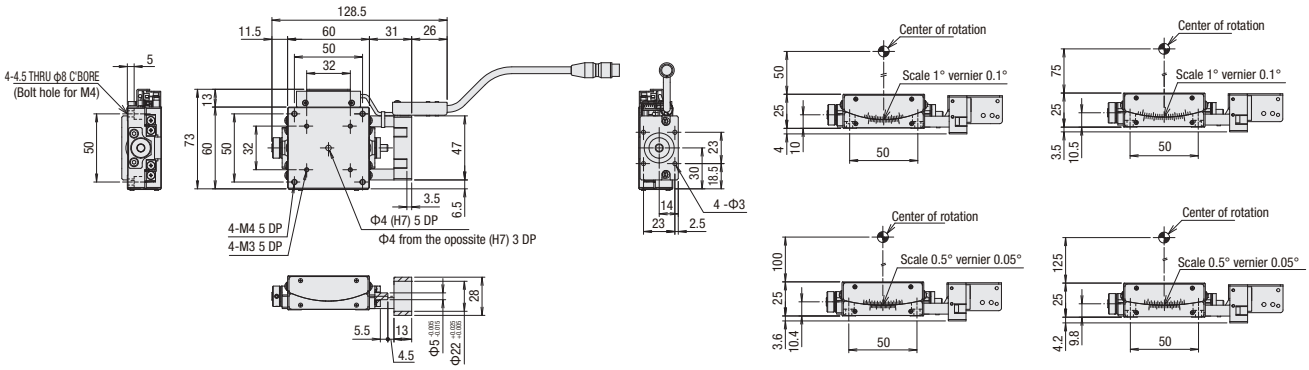
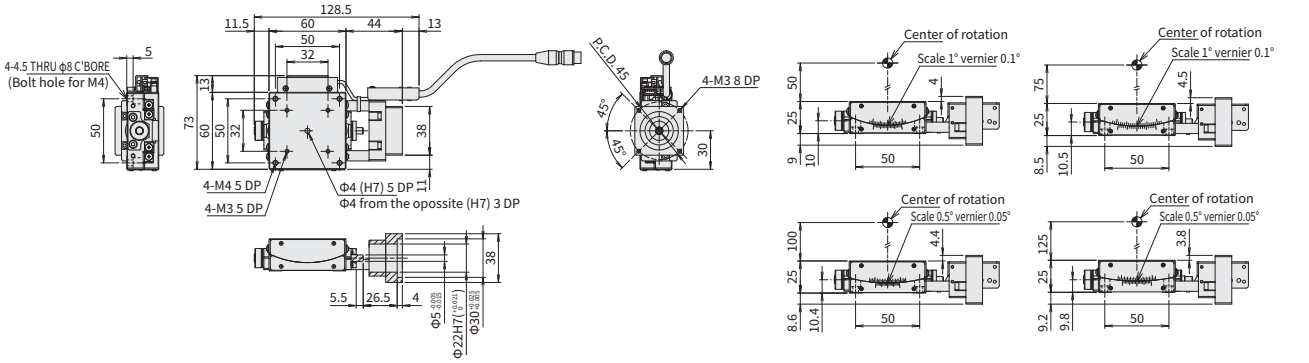
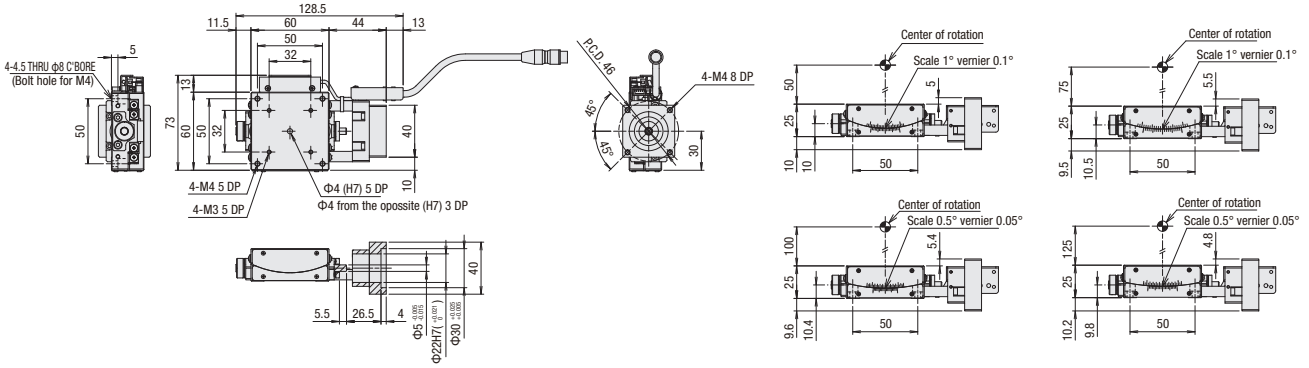
KGW06 series V-P28



KGW06 series V-S38



KGW06 series V-S40



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1.As load capacity and maximum speed depend on configuration of stage main body, please refrain from the use exceed the spec.
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Please see the attached operating and assembly sheet for mounting adjustment.

4. Some products may need fixing part of the connector on your side.
Disconnection may occur before fixation due to a connector and the main body is connected only with lead. Please handle with care.

◆At the time of purchase

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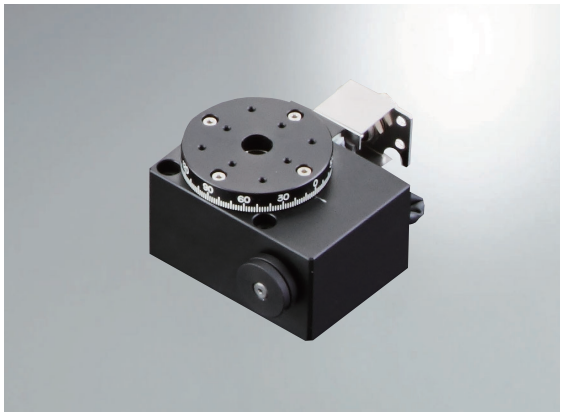
Rotary Stageϕ39：KRW04360V



accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor		2 of M2.5-6	4 of M3-12	2 of M4-12
	For Main Body	KRW04	3 of M3-30		
		KRW06	3 of M4-30		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		
■Hex wrench (for motor mounting)			○	-	-

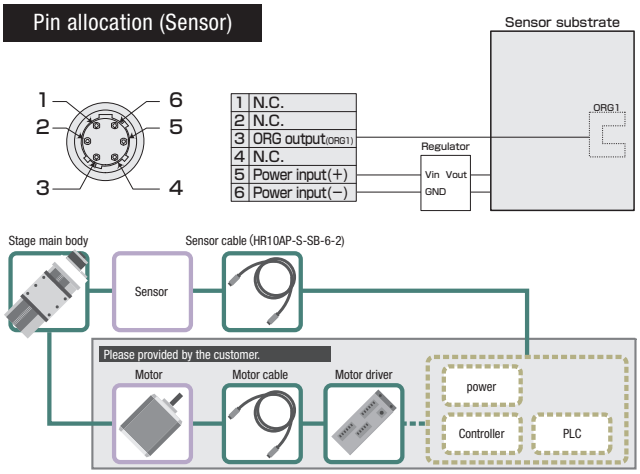
Model **KRW04360V** - Option code **P28**

1

1 Application Motor

Code	Speci cation
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)



S P E C				
Model		KRW04360V-P28	KRW04360V-S38	KRW04360V-S40
Mechanical specification	Travel length	360°		
	Table size	ϕ39mm		
	Travel mechanism (Reduction ratio)	Worm gear (Reduction ratio 1/120)		
	Guide	Deep groove ball bearing		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Resolution/Pulse	0.006° (Full)		
	MAX speed	30°/sec [5kHz]		
	Positioning accuracy	0.05°		
	Repeatability positioning accuracy	±0.01°		
	Load capacity	3.0kgf【29.4N】		
	Moment stiffness	0.74″/N・cm		
	Lost motion	0.05°		
	Backlash	0.1°		
	Parallelism	50μm		
	Eccentricity	5μm		
	Runout	30μm		

SENSOR	
Limit sensor	—
Origin sensor	Installed
Slit origin sensor	—
Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)
Power voltage	DC5～24V ±10%
Consumption current	35mA or less
Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA
Output logic	On detection (light shield condition): Output transistor OFF (Non-continuity)

※SPEC is reference for the standard model

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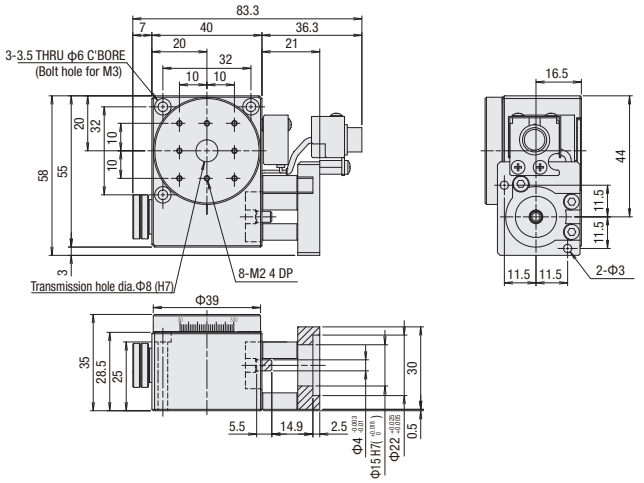
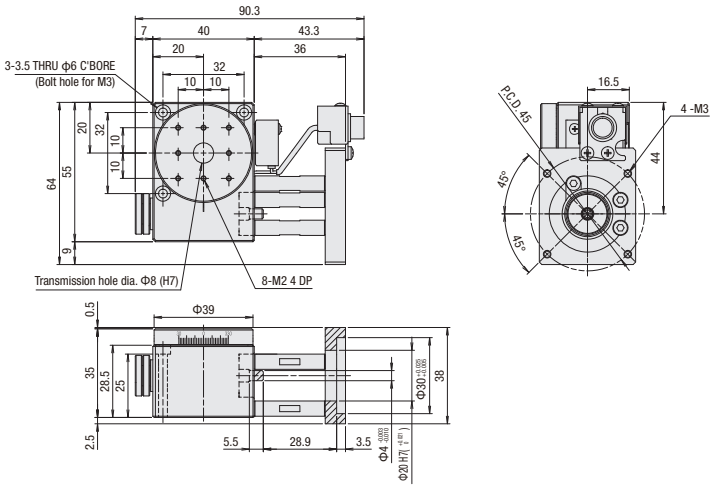
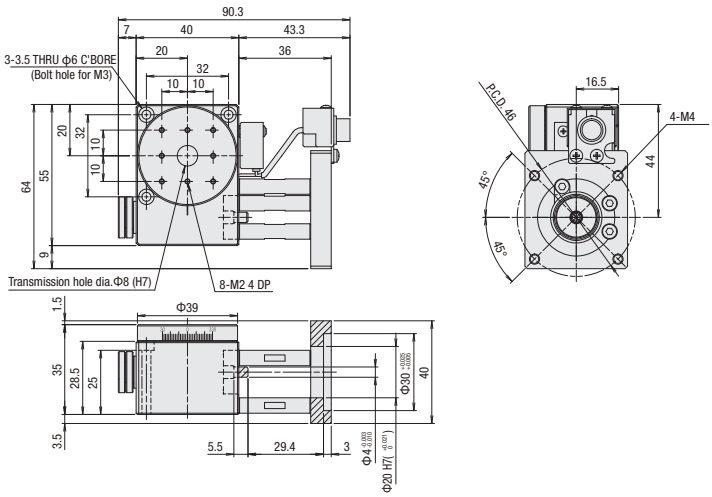
KRW04360V-P28



KRW04360V-S38



KRW04360V-S40



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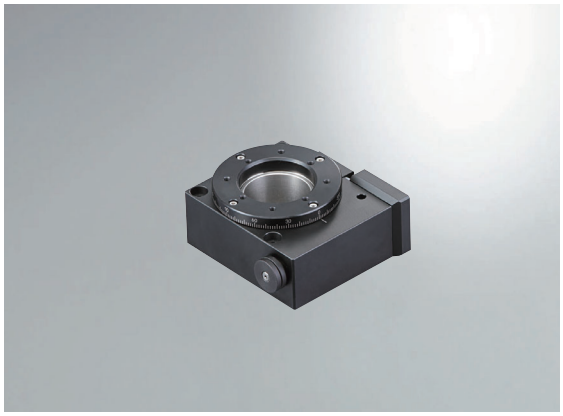
Rotary Stage ϕ59：KRW06360V



accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor		2 of M2.5-6	4 of M3-12	2 of M4-12
	For Main Body	KRW04	3 of M3-30		
		KRW06	3 of M4-30		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		
■Hex wrench (for motor mounting)			○	-	-

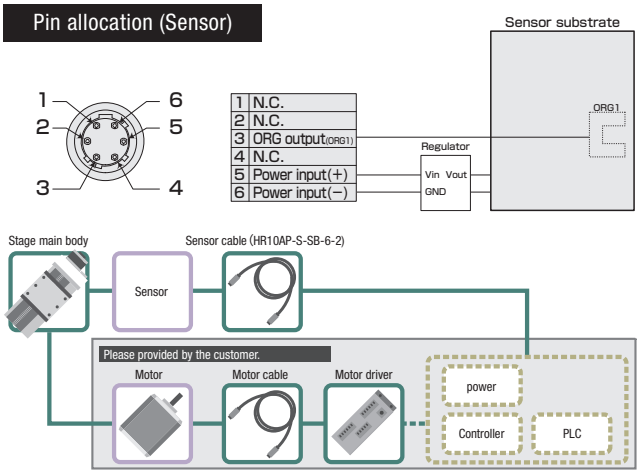
Model: **KRW06360V**-Option code: **P28**

1

1 Application Motor

Code	Specification
P28	□28 Steppingmotor
S38	□38 Servo motor
S40	□40 Servo motor

Pin allocation (Sensor)



SPEC				
Model		KRW06360V-P28	KRW06360V-S38	KRW06360V-S40
Mechanical specification	Travel length	360°		
	Table size	ϕ59mm		
	Travel mechanism (Reduction ratio)	Worm gear (Reduction ratio 1/180)		
	Guide	Deep groove ball bearing		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Resolution/Pulse	0.004° (Full)		
	MAX speed	20°/sec [5kHz]		
	Positioning accuracy	0.05°		
	Repeatability positioning accuracy	±0.01°		
	Load capacity	3.0kgf【29.4N】		
	Moment stiffness	0.2″/N・cm		
	Lost motion	0.05°		
	Backlash	0.05°		
	Parallelism	50μm		
	Eccentricity	5μm		
	Runout	30μm		

SENSOR	
Limit sensor	—
Origin sensor	Installed
Slit origin sensor	—
Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)
Power voltage	DC5～24V ±10%
Consumption current	35mA or less
Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current is 2mA
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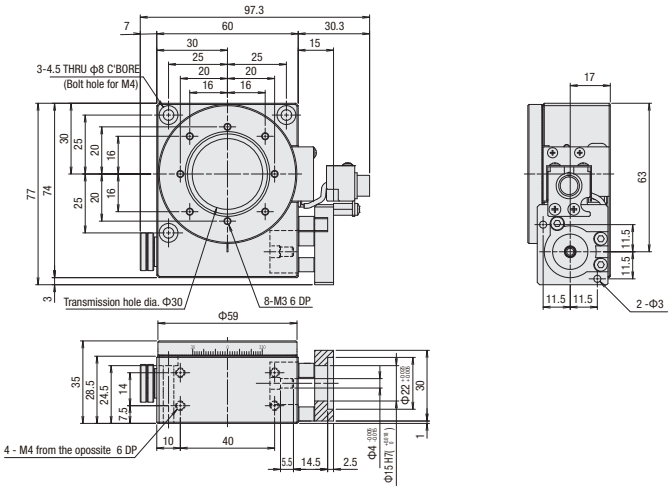
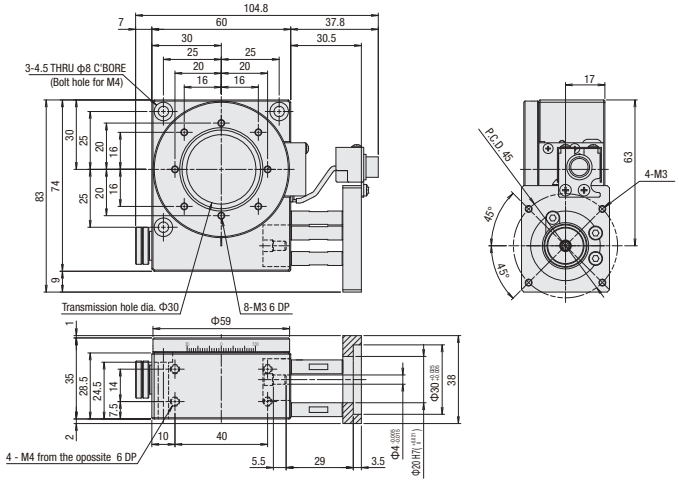
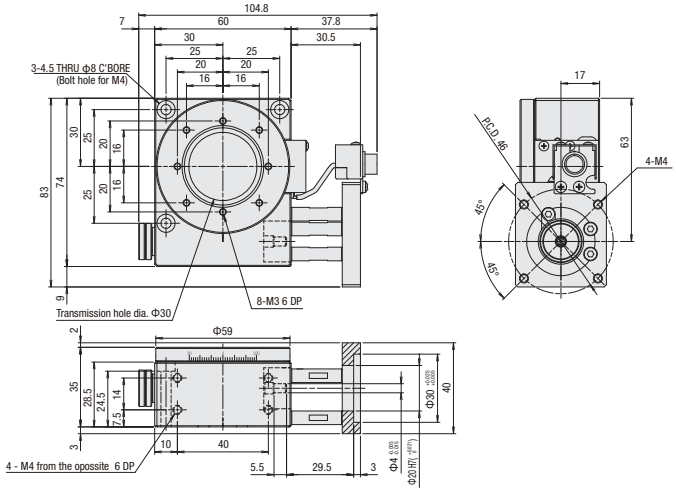
KRW06360V-P28



KRW06360V-S38



KRW06360V-S40



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