Discontinued 2024.8

Motorised Stage

- KXL series
- PG series
- KXT series
- KGB series
- KRB series
- Motorless

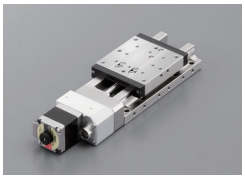
SURUGA SEIKI

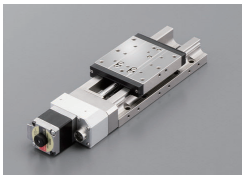
KXL series

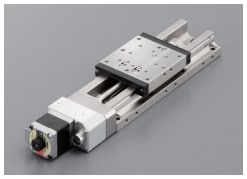
SURUGA SEIKI

CAVE-X POSITIONER

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


KXL06030-N


KXL06050-N


KXL06075-N


KXL06030-C


KXL06050-C


KXL06075-C

Freely customize the motor

See page P.009

RoHS

■The drive unit areas are coated in clean grease.

Model: KXL06 | Selection code: 030-N1-C | Option code: □ □

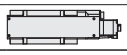
1 2 3 4 5 6

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

1 Travel length

030	30mm
050	50mm
075	75mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

4 Motor option

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

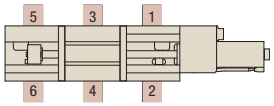
* Code MA•PA•UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

Model	Uncovered		KXL06030-N1-C	KXL06030-N2-C	KXL06050-N1-C	KXL06050-N2-C	KXL06075-N1-C	KXL06075-N2-C
	Covered		KXL06030-C1-C	KXL06030-C2-C	KXL06050-C1-C	KXL06050-C2-C	KXL06075-C1-C	KXL06075-C2-C
Mechanical specification	Travel length		30mm		50mm		75mm	
	Table size		60×60mm					
	Feed screw (Ball screw)		φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2
	Guide		Linear ball guide					
	Main materials-Finishing		Stainless—Opposite side of the end face finishing					
	Weight	Uncovered	1.28kg		1.40kg		1.54kg	
		Covered	1.34kg		1.44kg		1.60kg	
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm
		Microstep	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)
	MAX speed		30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec
	Uni-directional positioning accuracy		Within 5μm				Within 7μm	
	Repeatability positioning accuracy		Within ±0.5μm					
	Load capacity		12kgf [117.6N]					
	Moment stiffness		Pitch 0.05/yaw 0.05/roll 0.05 ["/N・cm]					
	Lost motion		Within 1μm					
	Backlash		Within 1μm					
	Straightness		Within 3μm					
	Parallelism		Within 15μm					
	Motion parallelism		Within 10μm					
	Pitching/Yawing		2Within 0"/Within 15"					
Sensor	Limit sensor		Installed					
	Origin sensor		— *Attachable in the origin sensor option					
	Slit origin sensor		—					
Provided screw (Hexagon-headed bolt)			8 of M4—14					

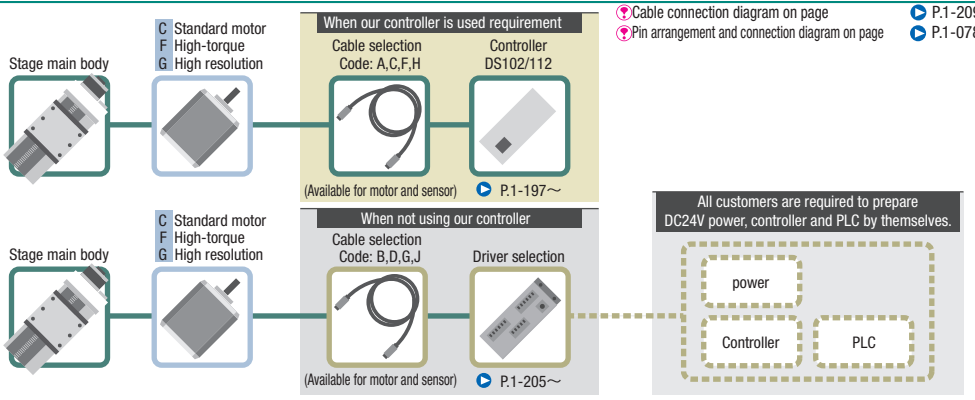
* Might be changed specification due to motors. See page P.1-213~ for details.

Motor option

C Standard motor
Motor model
C005C-90215P-1

F High-torque
Motor model
PK525HPB-C1

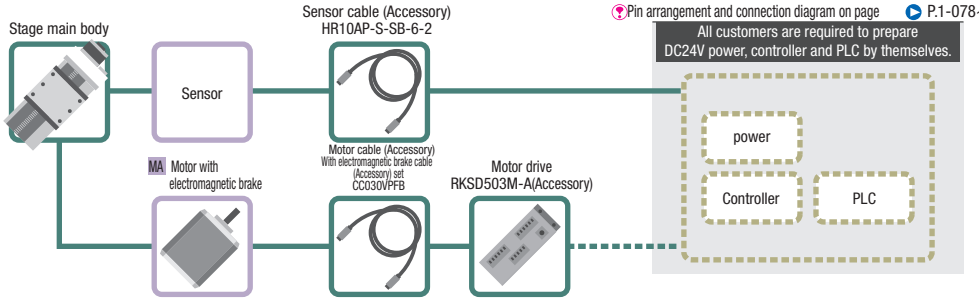
G High resolution
Motor model
PK523HPMB-C1



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

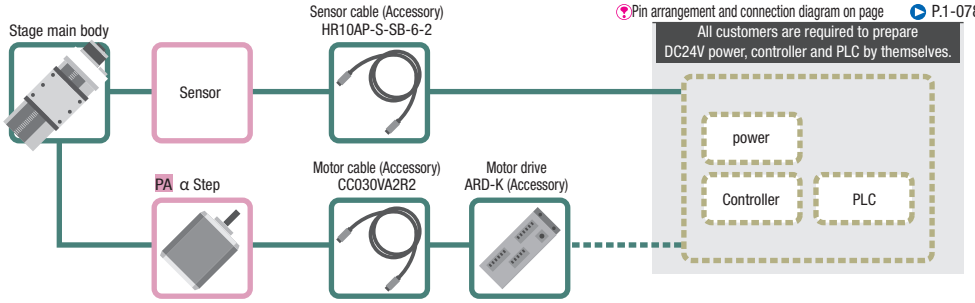
MA With electromagnetic brake
Motor model
PKE545MC-A1



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

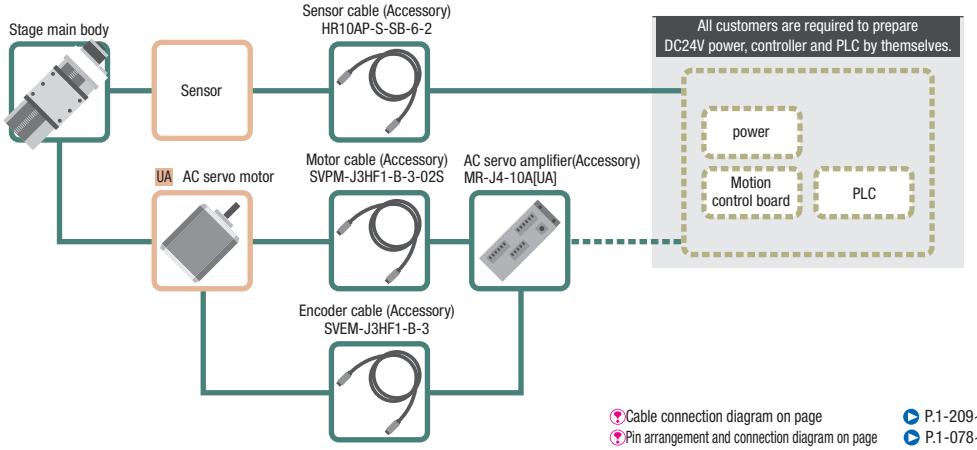
PA α Step
Motor model
ARM24SAK



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

UA AC servo motor
Motor model
HG-KR053



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor code			C	F	G	MA	PA	UA
Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type			5 phase stepping motor 0.75A/ Phase			5 phase 0.35A/phase	α step motor	AC servo motor
Motor model*			**C005C-90215P-1**	**PK525HPB-C1**	**PK523HPMB-C1**	**PKE545MC-A1**	**ARM24SAK**	**HG-KR053**
Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm(Set to 1000P/R)	22 bits encoder (4194304P/R)
		Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	—	
	Lead 2mm	Full/Half	4μm/2μm		2μm/1μm	4μm/2μm	2μm(Set to 1000P/R)	
		Micro step (1/20 split)	0.2μm		0.1μm	0.2μm	—	
	Max. speed	Lead 1mm	30mm/sec	35mm/sec	25mm/sec	25mm/sec	40mm/sec	50mm/sec
		Lead 2mm	35mm/sec	45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec

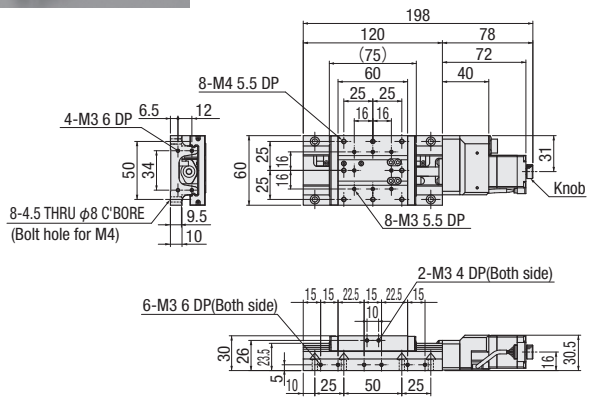
* Model is our own management model.

CAVE-X POSITIONER

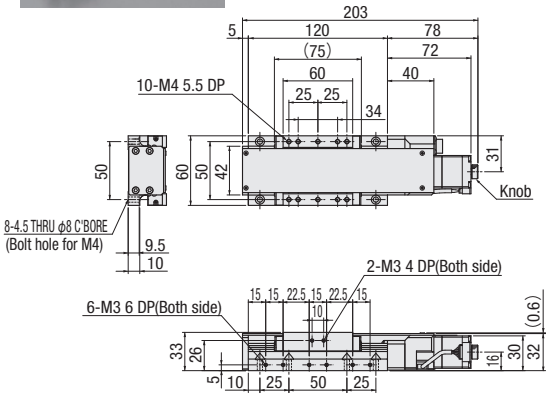
X-axis Linear Ball Guide: KXL06030/KXL06050/KXL06075

Dimensional outline drawings

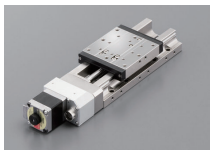
KXL06030-N1-C (KXL06030-N2-C)

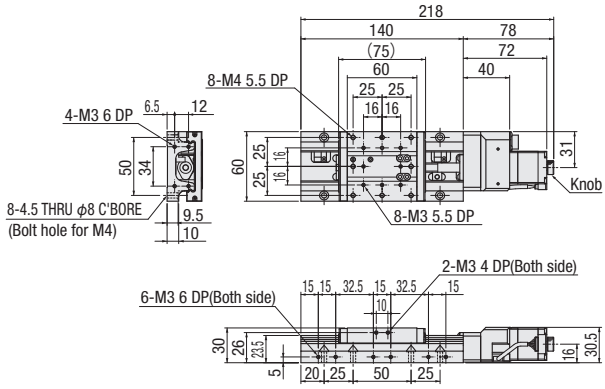


KXL06030-C1-C (KXL06030-C2-C)

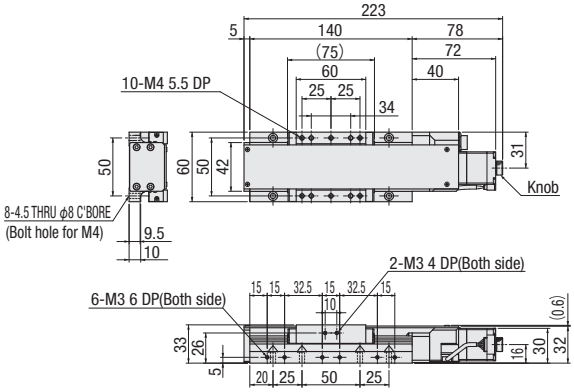


KXL06050-N1-C (KXL06050-N2-C)

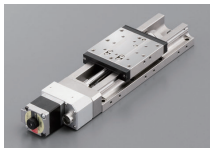


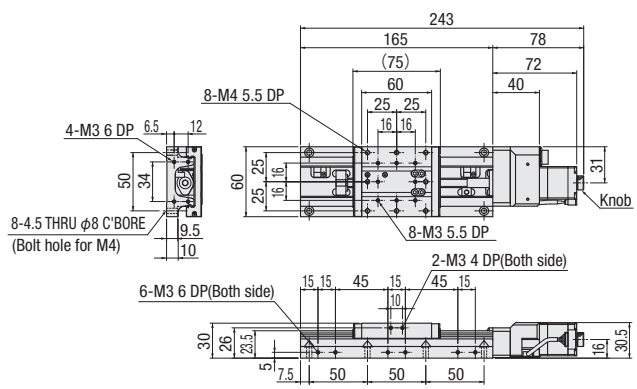


KXL06050-C1-C (KXL06050-C2-C)

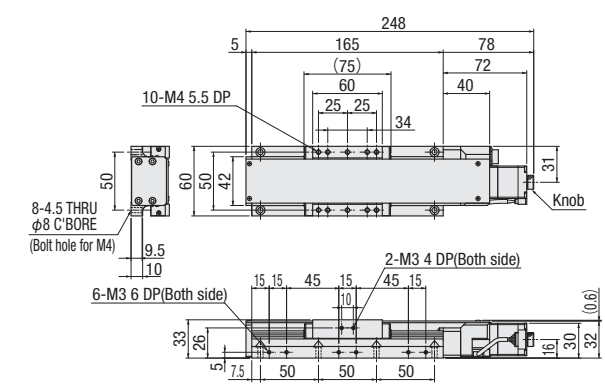


KXL06075-N1-C (KXL06075-N2-C)





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



Dimensional outline drawings

C Standard

Motor model C005C-90215P-1

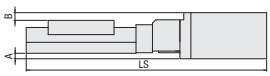
F High-torque

Motor model PK525HPB-C1

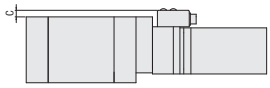
G High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

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

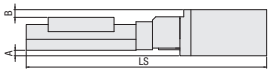
Covered

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

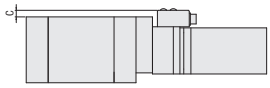
MA With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

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

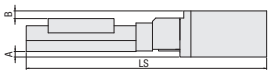
Covered

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

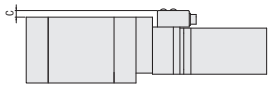
PA α step

Motor model ARM24SAK

Side view



Top view



Uncovered

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

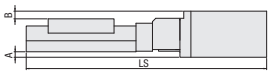
Covered

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

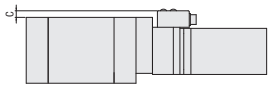
UA AC servo motor

Motor model HG-KR053

Side view



Top view



Uncovered

Model	UA (AC servo motor)				C (Standard)
	Motor size	A	B	C	LS
KXL06030-N□-UA	□40	4.7	6.5	6	240.4	198
KXL06050-N□-UA					260.4	218
KXL06075-N□-UA					285.4	243

Covered

Model	UA (AC servo motor)				C (Standard)
	Motor size	A	B	C	LS
KXL06030-C□-UA	□40	4.7	3.5	6	245.4	203
KXL06050-C□-UA					265.4	223
KXL06075-C□-UA					290.4	248

CAVE-X POSITIONER

X-axis Linear Ball Guide: KXL06100/KXL06150

KXL06100-N

KXL06150-N

KXL06100-C

KXL06150-C

Freely customize the motor

RoHS

See page P.009

Model: KXL06 | Selection code: 100-N2-F | Option code: □□

1 2 3 4 5 6

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

1 Travel length

100	100mm
150	150mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

2	Lead 2mm

4 Motor option

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

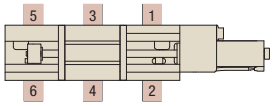
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

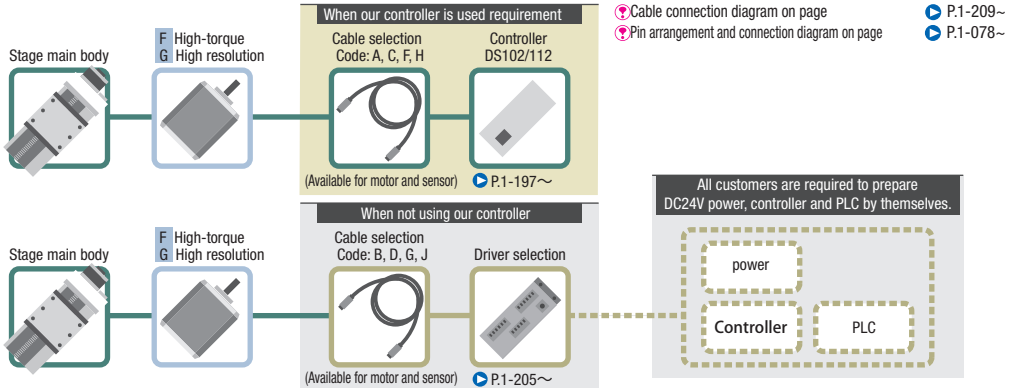
Model	Uncovered		KXL06100-N2-F	KXL06150-N2-F
	Covered		KXL06100-C2-F	KXL06150-C2-F
Mechanical specification	Travel length		100mm	150mm
	Table size		60×60mm	
	Feed screw (Ball screw)		φ8 lead 2	
	Guide		Linear ball guide	
	Main materials-Finishing		Stainless–Opposite side of the end face finishing	
	Weight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

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

Motor option

F High-torque
Motor model
PK525HPB-C1

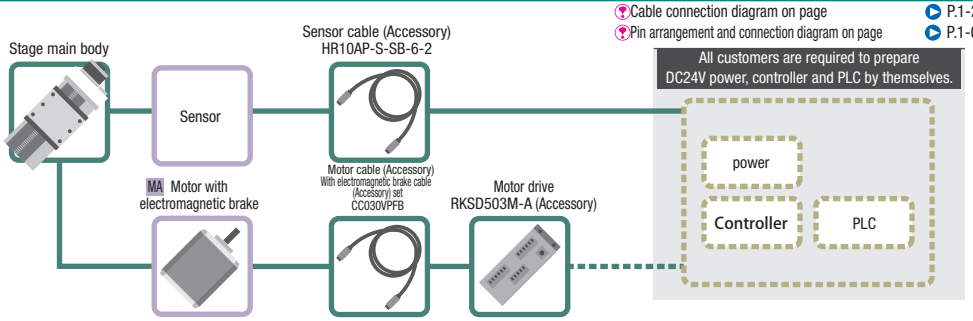
G High resolution
Motor model
PK523HPMB-C1



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

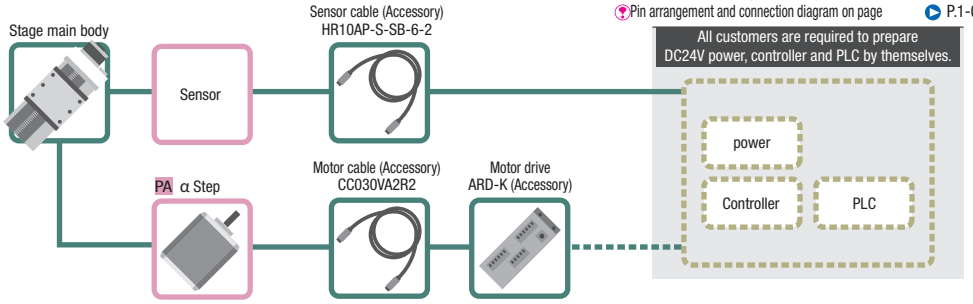
MA With electromagnetic brake
Motor model
PKE545MC-A1



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

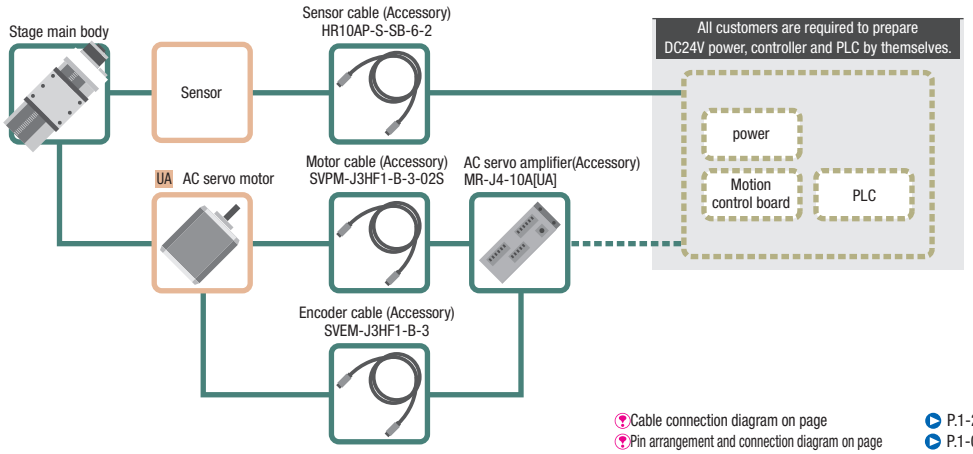
PA α Step
Motor model
ARM24SAK



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor option

UA AC servo motor
Motor model
HG-KR053



Cable connection diagram on page P.1-209～
Pin arrangement and connection diagram on page P.1-078～

Motor code			F	G	MA	PA	UA
Feature			High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type			5 phase stepping motor 0.75A/ Phase		5 phase stepping motor 0.35A/phase	α step motor	AC servo motor
Motor model*			**PK525HPB-C1**	**PK523HPMB-C1**	**PKE545MC-A1**	**ARM24SAK**	**HG-KR053**
Resolution	Lead 2mm	Full/Half	4μm/2μm	2μm/1μm	4μm/2μm	2μm (Set to 1000P/R)	22 bits encoder (4194304P/R)
		Micro step (1/20 split)	0.2μm	0.1μm	0.2μm	—	
MAX speed	Lead 2mm		45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec

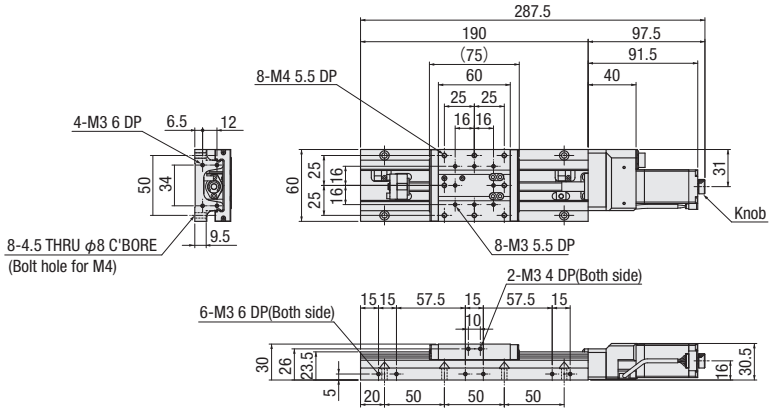
* Model is our own management model.

CAVE-X POSITIONER

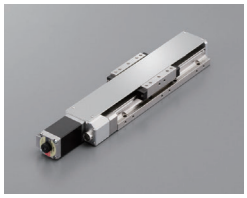
X-axis Linear Ball Guide: KXL06100/KXL06150

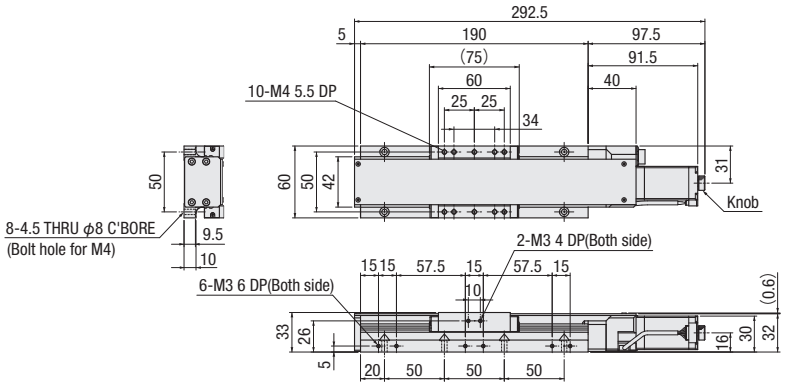
Dimensional outline drawings

KXL06100-N2-F

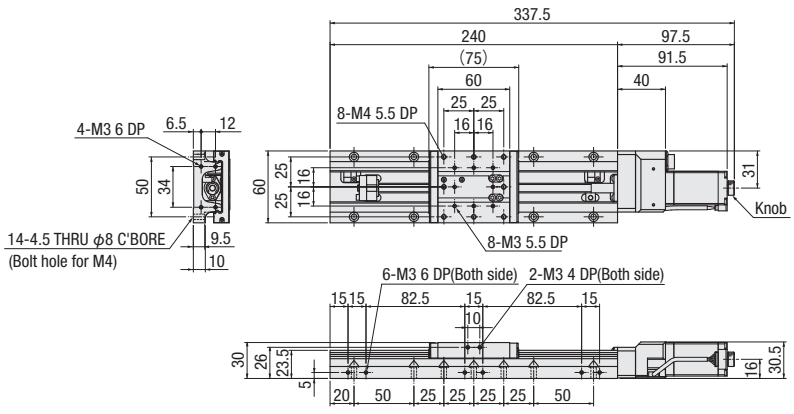


KXL06100-C2-F

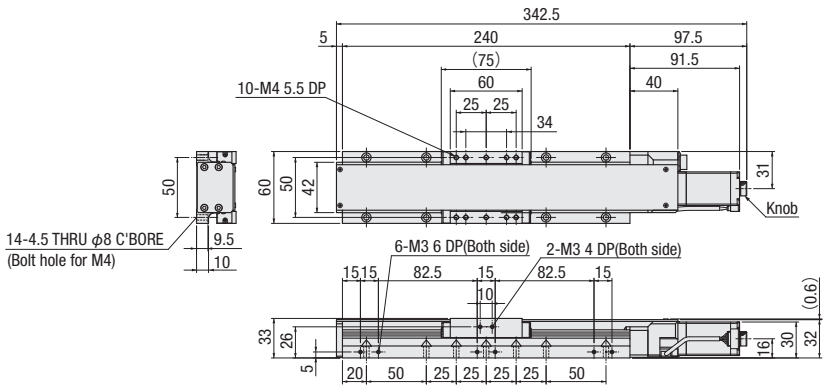




KXL06150-N2-F



KXL06150-C2-F



Dimensional outline drawings

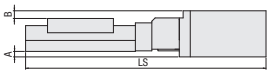
F High-torque

Motor model PK525HPB-C1

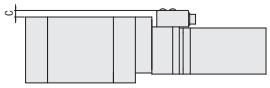
G High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

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

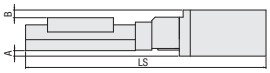
Covered

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

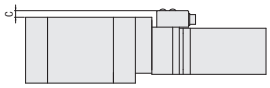
MA With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

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

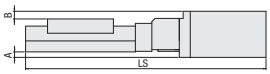
Covered

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

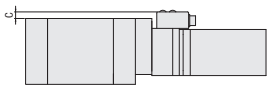
PA α step

Motor model ARM24SAK

Side view



Top view



Uncovered

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

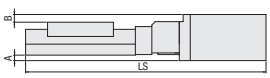
Covered

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

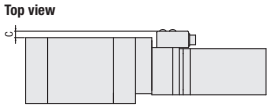
UA AC servo motor

Motor model HG-KR053

Side view



Top view



Uncovered

Model	UA (AC servo motor)				F (High-torque)
	Motor size	A	B	C	LS
KXL06100-N2-UA	□40	4.7	6.5	6	310.4	288
KXL06150-N2-UA					360.4	338

Covered

Model	UA (AC servo motor)				F (High-torque)
	Motor size	A	B	C	LS
KXL06100-C2-UA	□40	4.7	3.5	6	315.4	293
KXL06150-C2-UA					365.4	343

CAVE-X POSITIONER

X-axis Linear Ball Guide: KXL06200/KXL06300

KXL06200-N

KXL06300-N

KXL06200-C

KXL06300-C

Freely customize the motor

RoHS

See page P.009

Model / Selection code / Option code

KXL06 200-N2-F □ □

1 2 3 4 5 6

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

1 Travel length

200	200mm
300	300mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

2	Lead 2mm

4 Motor option

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

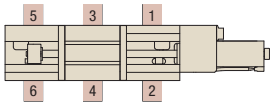
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

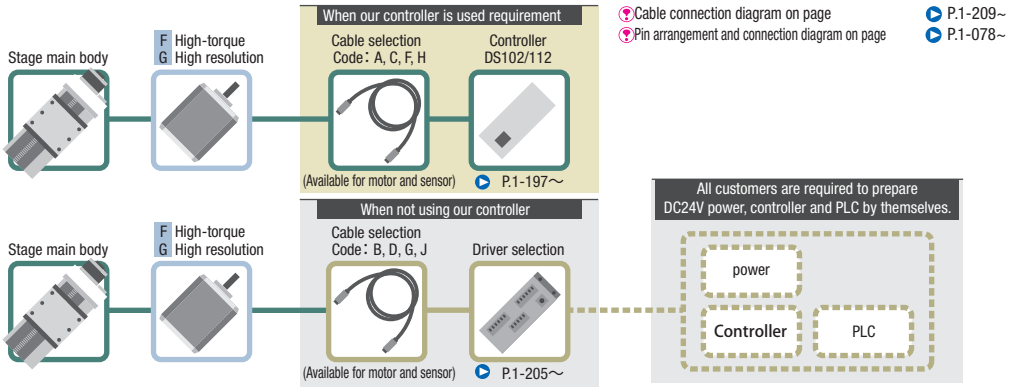
Model	**Uncovered**		**KXL06200-N2-F**	**KXL06300-N2-F**
	Covered		**KXL06200-C2-F**	**KXL06300-C2-F**
Mechanical specification	Travel length		200mm	300mm
	Table size		60×60mm	
	Feed screw (Ball screw)		φ8 lead 2	
	Guide		Linear ball guide	
	Main materials-Finishing		Stainless–Opposite side of the end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

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

Motor option

F High-torque
Motor model
PK525HPB-C1

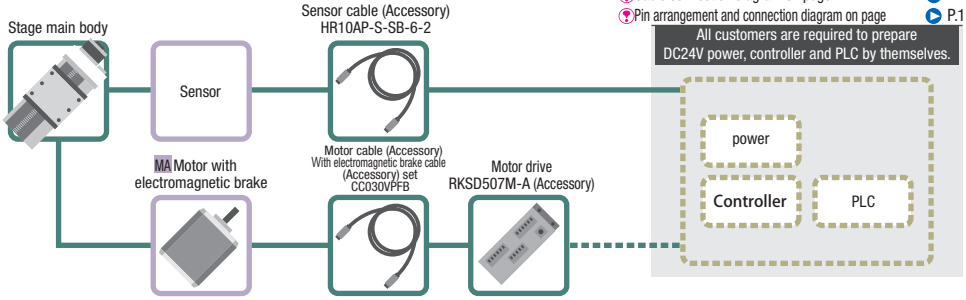
G High resolution
Motor model
PK523HPMB-C1



Cable connection diagram on page P.1-209~
Pin arrangement and connection diagram on page P.1-078~

Motor option

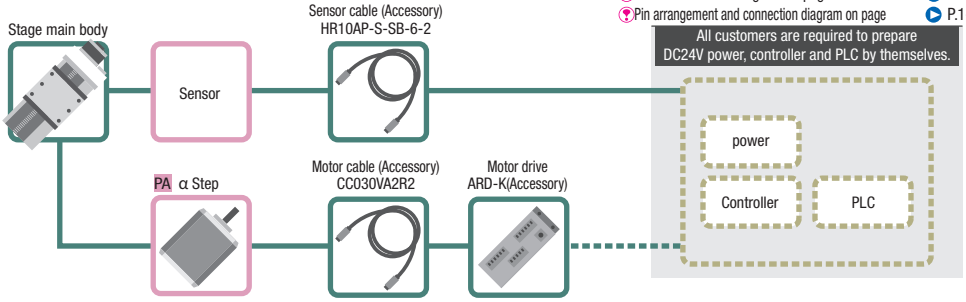
MA With electromagnetic brake
Motor model
PKE545MC-A1



Cable connection diagram on page P.1-209~
Pin arrangement and connection diagram on page P.1-078~

Motor option

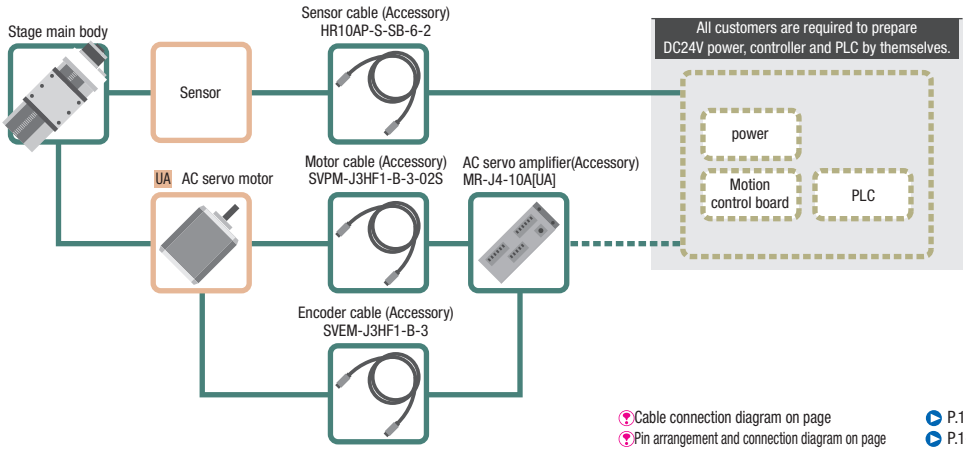
PA α Step
Motor model
ARM24SAK



Cable connection diagram on page P.1-209~
Pin arrangement and connection diagram on page P.1-078~

Motor option

UA AC servo motor
Motor model
HG-KR053



Cable connection diagram on page P.1-209~
Pin arrangement and connection diagram on page P.1-078~

Motor code			F	G	MA	PA	UA
Feature			High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type			5 phase stepping motor 0.75A/Phase		5 phase stepping motor 0.35A/phase	α step motor	AC servo motor
Motor model*			**PK525HPB-C1**	**PK523HPMB-C1**	**PKE545MC-A1**	**ARM24SAK**	**HG-KR053**
Resolution	Lead 2mm	Full/Half	4μm/2μm	2μm/1μm	4μm/2μm	2μm (1000P/R setting)	22 bits encoder (4194304P/R)
		Micro step (1/20 split)	0.2μm	0.1μm	0.2μm	—	
MAX speed	Lead 2mm		45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec

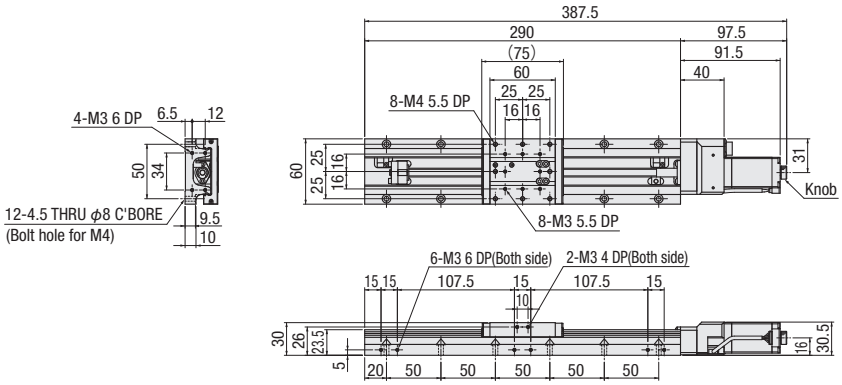
*Model is our own management model.

CAVE-X POSITIONER

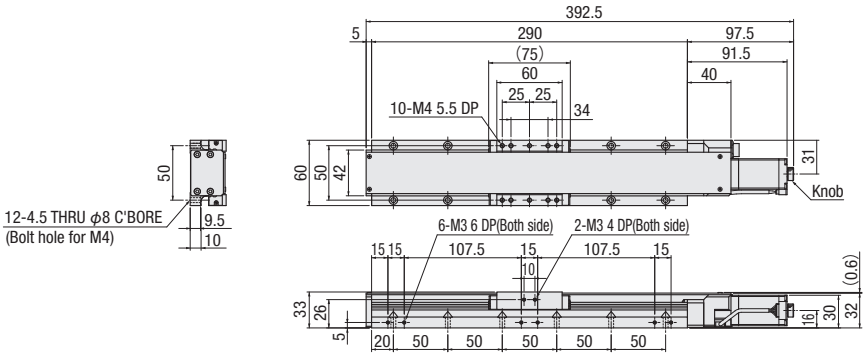
X-axis Linear Ball Guide: KXL06200/KXL06300

Dimensional outline drawings

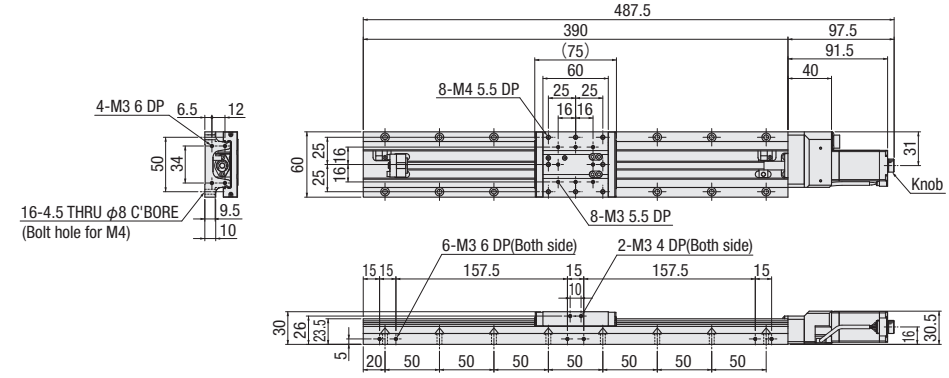
KXL06200-N2-F



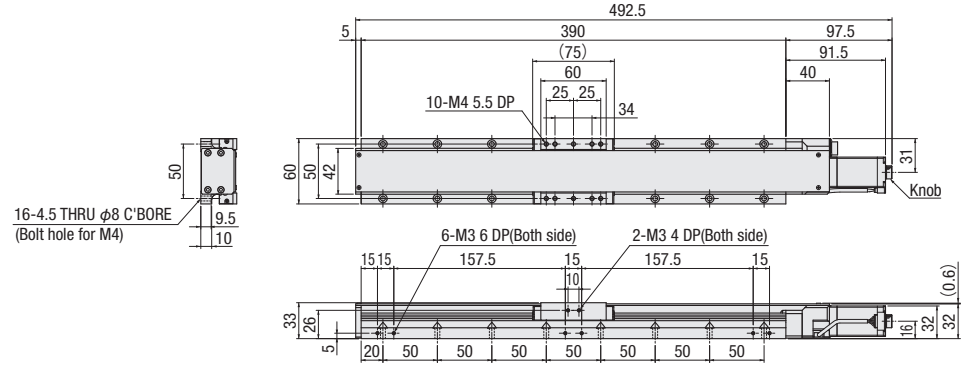
KXL06200-C2-F



KXL06300-N2-F



KXL06300-C2-F



Dimensional outline drawings

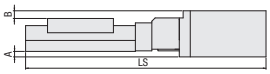
F High-torque

Motor model PK525HPB-C1

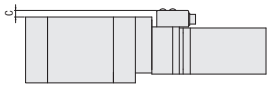
G High resolution

Motor model PK523HPMB-C1

Side view



Top view



Uncovered

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

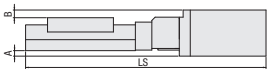
Covered

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

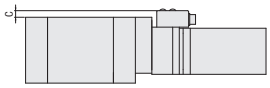
MA With electromagnetic brake

Motor model PKE545MC-A1

Side view



Top view



Uncovered

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

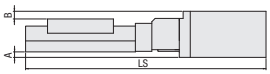
Covered

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

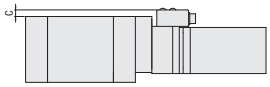
PA α step

Motor model ARM24SAK

Side view



Top view



Uncovered

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

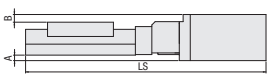
Covered

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

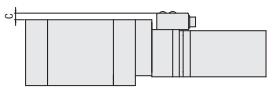
UA AC servo motor

Motor model HG-KR053

Side view



Top view



Uncovered

Model	UA (AC servo motor)				F (High-torque)
	Motor size	A	B	C	LS
KXL06200-N2-UA	□40	4.7	6.5	6	410.4	388
KXL06300-N2-UA					510.4	488

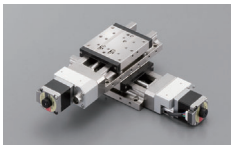
Covered

Model	UA (AC servo motor)				F (High-torque)
	Motor size	A	B	C	LS
KXL06200-C2-UA	□40	4.7	3.5	6	415.4	393
KXL06300-C2-UA					515.4	493

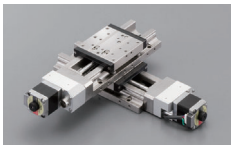
CAVE-X POSITIONER

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

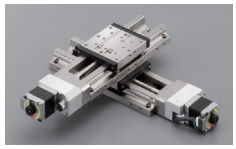
KYL06030-N



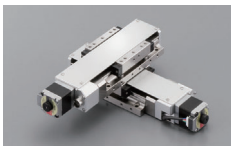
KYL06050-N



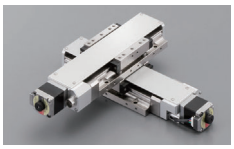
KYL06075-N



KYL06030-C



KYL06050-C



KYL06075-C

RoHS

Model / Selection code / Option code

KYL06 030-N1-C □ □

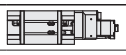
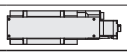
1 2 3 4 5 6

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

1 Travel length

030	30mm
050	50mm
075	75mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

4 Motor option

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

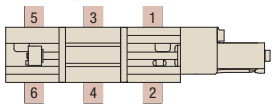
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

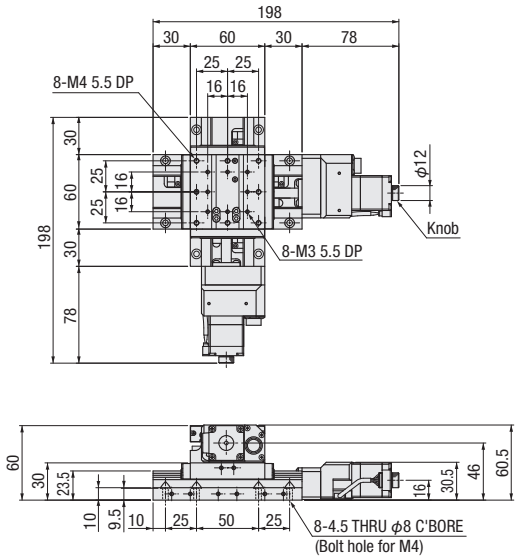
Model		Uncovered	KYL06030-N1-C	KYL06030-N2-C	KYL06050-N1-C	KYL06050-N2-C	KYL06075-N1-C	KYL06075-N2-C
		Covered	KYL06030-C1-C	KYL06030-C2-C	KYL06050-C1-C	KYL06050-C2-C	KYL06075-C1-C	KYL06075-C2-C
Mechanical specification	Travel length		30mm		50mm		75mm	
	Table size		60×60mm					
	Feed screw (Ball screw)		φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2
	Guide		Linear ball guide					
	Main materials-Finishing		Stainless–Opposite side of the end face finishing					
	Weight	Uncovered	2.56kg		2.8kg		3.08kg	
		Covered	2.68kg		2.88kg		3.32kg	
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm
		Microstep	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)	0.1μm (1/20 on resolution)	0.2μm (1/20 on resolution)
	MAX speed		30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec
	Load capacity		10kgf [98N]					
	Perpendicularity		Within 15μm/Full stroke		Within 25μm/Full stroke		Within 37.5μm/Full stroke	
Sensor	Limit sensor		Installed					
	Origin sensor		— *Attachable in origin sensor option					
	Slit origin sensor		—					
Provided screw (Hexagon-headed bolt)			8 of M4—14					

Single axis accuracy specification	Uni-directional positioning accuracy	Within 5μm	Within 7μm
	Repeatability positioning accuracy	Within ±0.5μm	
	Lost motion	Within 1μm	
	Backlash	Within 1μm	
	Straightness	Within 3μm	
	Pitching/Yawing	Within 20″/Within 15″	

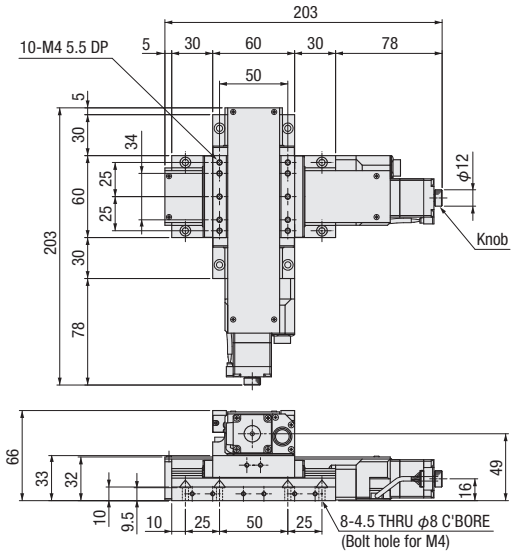
* Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

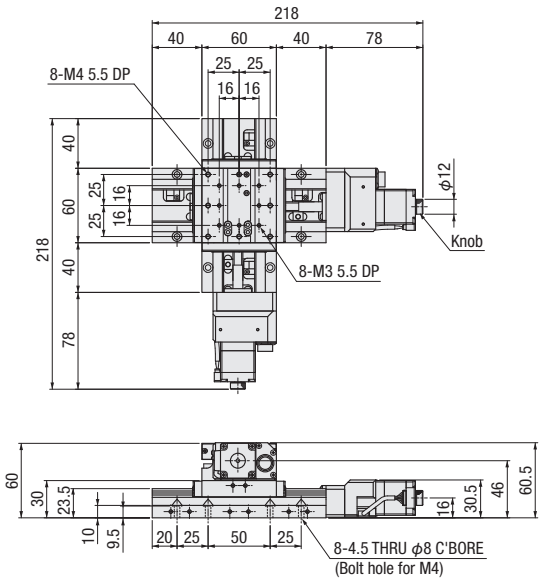
KYL06030-N1-C (KYL06030-N2-C)



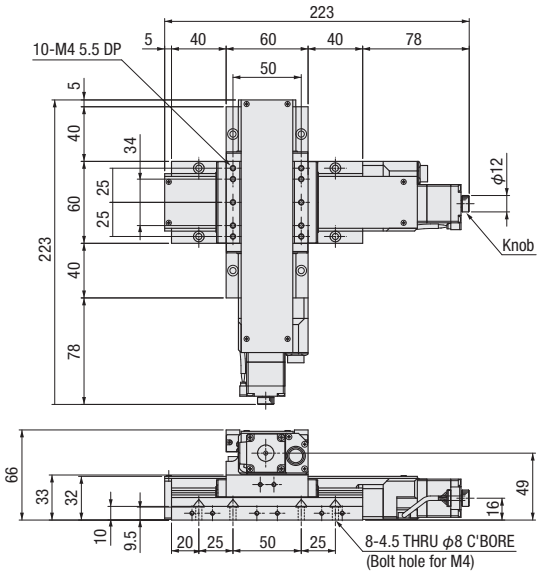
KYL06030-C1-C (KYL06030-C2-C)



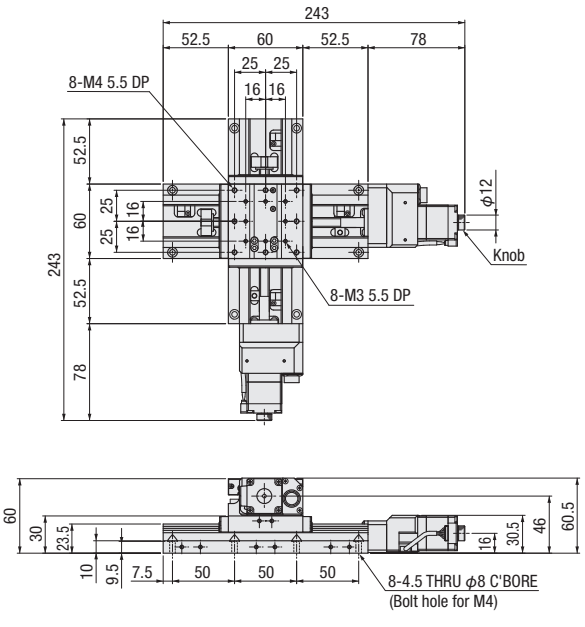
KYL06050-N1-C (KYL06050-N2-C)



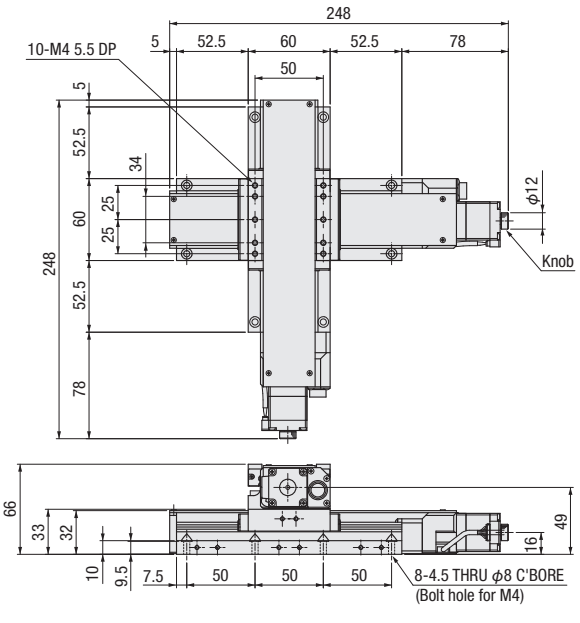
KYL06050-C1-C (KYL06050-C2-C)



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



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



CAVE-X POSITIONER

XY-axis Linear Ball Guide: KYL06100/KYL06150


KYL06100-N


KYL06150-N


KYL06100-C


KYL06150-C

RoHS

Model: KYL06 | Selection code: 100-N2-F | Option code: □□

1 2 3 4 5 6

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

1 Travel length

100	100mm
150	150mm

2 Cover type

N	Uncovered
C	Covered

3 Ball screw lead selection

2	Lead 2mm

4 Motor option

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

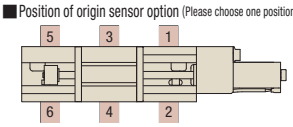
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

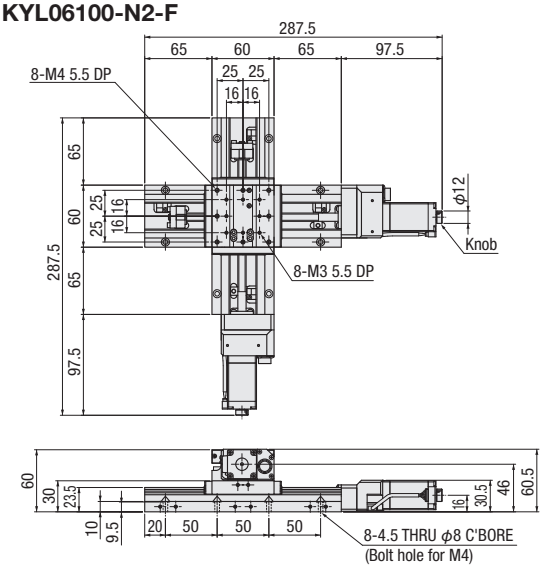
Model		Uncovered	KYL06100-N2-F	KYL06150-N2-F
		Covered	KYL06100-C2-F	KYL06150-C2-F
Mechanical specification	Travel length		100mm	150mm
	Table size		60×60mm	
	Feed screw (Ball screw)		ϕ8 lead 2	
	Guide		Linear ball guide	
	Main materials-Finishing		Stainless–Opposite sid.e of the end face finishing	
	Weight	Uncovered	3.6kg	4.2kg
		Covered	3.72kg	4.32kg
Accuracy specification	Resolution (Pulse)	Full/Half	4μm/2μm	
		Microstep	0.2μm (1/20 on resolution)	
	MAX speed		45mm/sec	
	Load capacity		10kgf [98N]	
	Perpendicularity		Within 50μm/Full stroke	Within 75μm/Full stroke
Sensor	Limit sensor		Installed	
	Origin sensor		— *Attachable in origin sensor option	
	Slit origin sensor		—	
Provided screw (Hexagon-headed bolt)			8 of M4—14	14 of M4—14

Single axis accuracy specification	Uni-directional positioning accuracy	Within 10μm	Within 15μm
	Repeatability positioning accuracy	Within ±0.5μm	
	Lost motion	Within 1μm	
	Backlash	Within 1μm	
	Straightness	Within 5μm	
	Pitching/Yawing	Within 25″/Within 20″	

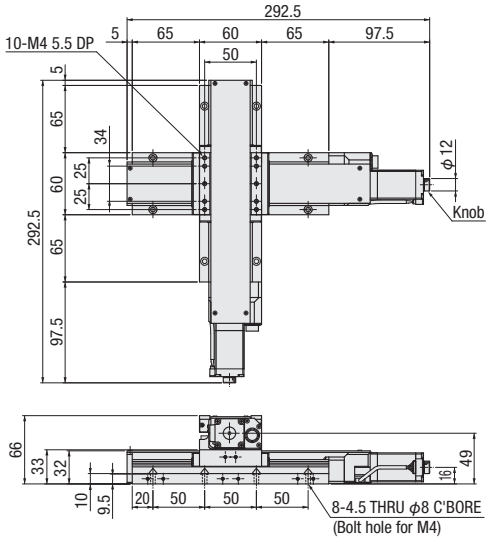
* Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

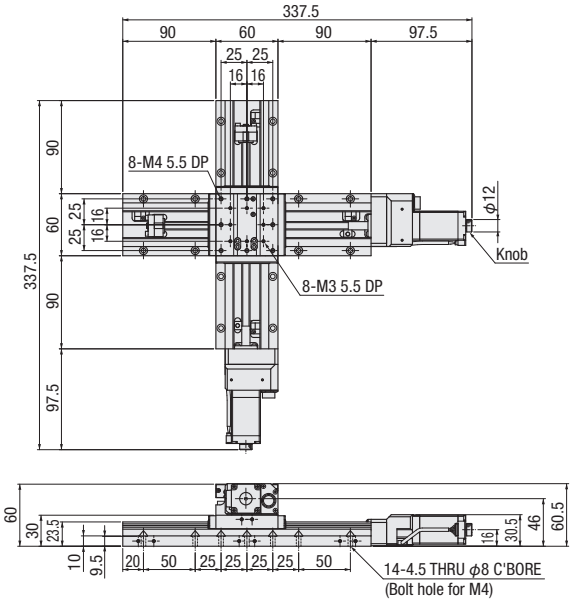
KYL06100-N2-F



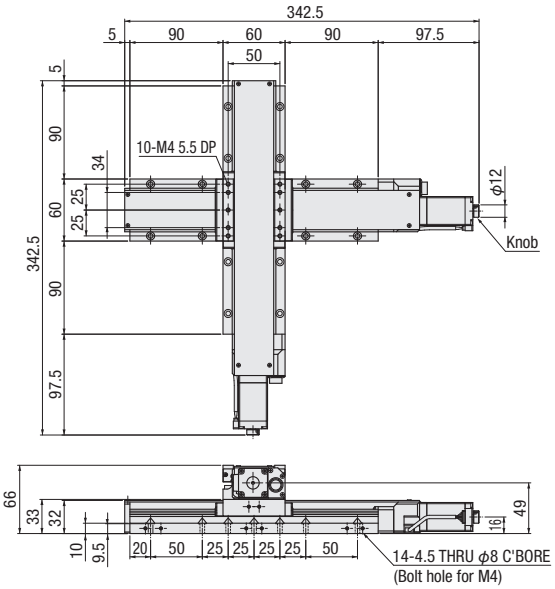
KYL06100-C2-F



KYL06150-N2-F



KYL06150-C2-F



CAVE-X POSITIONER

XY-axis Linear Ball Guide: KYL06200/KYL06300

KYL06200-N

KYL06300-N

KYL06200-C

KYL06300-C

RoHS

Model / Selection code / Option code

KYL06 200-N2-F □ □

1 2 3 4 5 6

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

1 Travel length

200	200mm
300	300mm

2 Cover type

N	Uncovered
C	Covered

3 Ball screw lead selection

2	Lead 2mm

4 Motor option

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

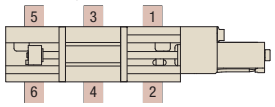
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

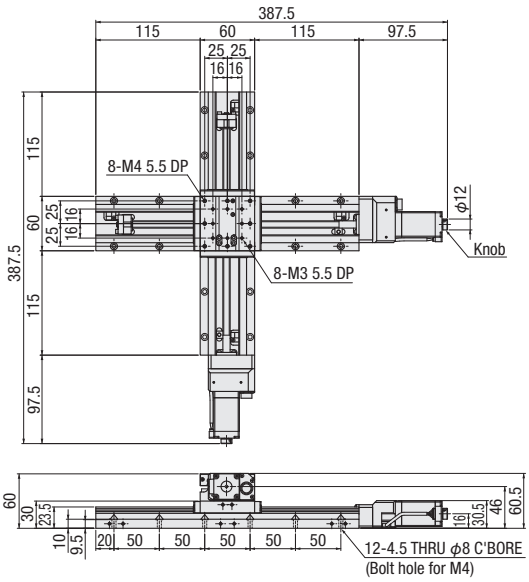
Model		Uncovered	KYL06200-N2-F	KYL06300-N2-F
		Covered	KYL06200-C2-F	KYL06300-C2-F
Mechanical specification	Travel length		200mm	300mm
	Table size		60×60mm	
	Feed screw (Ball screw)		φ8 lead 2	
	Guide		Linear ball guide	
	Main materials-Finishing		Stainless–Opposite side of the end face finishing	
	Weight	Uncovered	4.84kg	6.04kg
		Covered	4.96kg	6.24kg
Accuracy specification	Resolution (Pulse)	Full/Half	4μm/2μm	
		Microstep	0.2μm (1/20 on resolution)	
	MAX speed		45mm/sec	
	Load capacity		10kgf [98N]	
	Perpendicularity		Within 100μm/Full stroke	Within 150μm/Full stroke
Sensor	Limit sensor		Installed	
	Origin sensor		– *Attachable in origin sensor option	
	Slit origin sensor		–	
Provided screw (Hexagon-headed bolt)			12 of M4—14	16 of M4—14

Single axis accuracy specification	Uni-directional positioning accuracy	Within 15μm	Within 25μm
	Repeatability positioning accuracy	Within ±0.5μm	
	Lost motion	Within 1μm	
	Backlash	Within 1μm	
	Straightness	Within 7μm	
	Pitching/Yawing	Within 30″/Within 20″	Within 35″/Within 20″

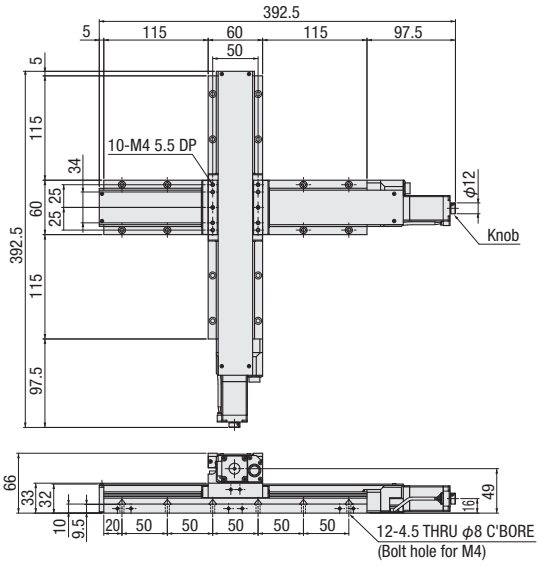
* Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

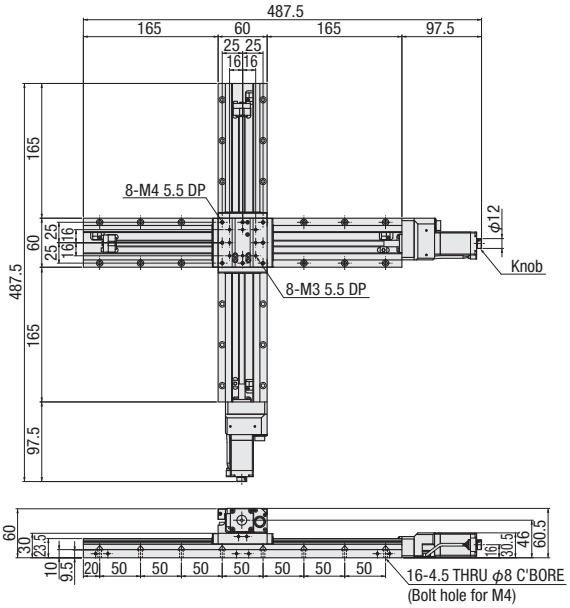
KYL06200-N2-F



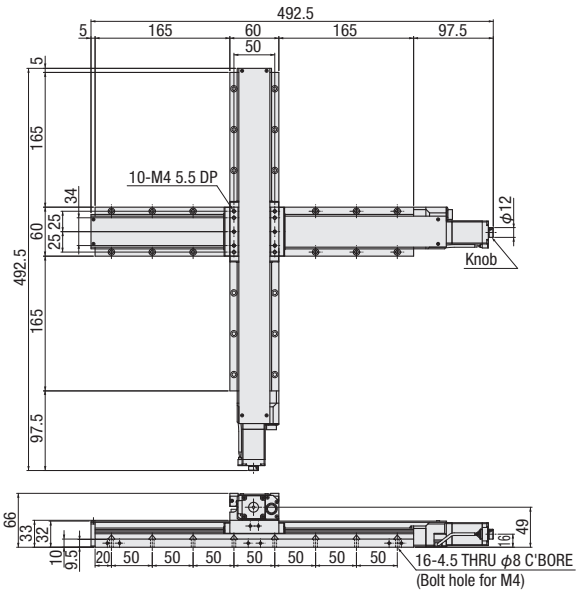
KYL06200-C2-F



KYL06300-N2-F



KYL06300-C2-F



Support guide option

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

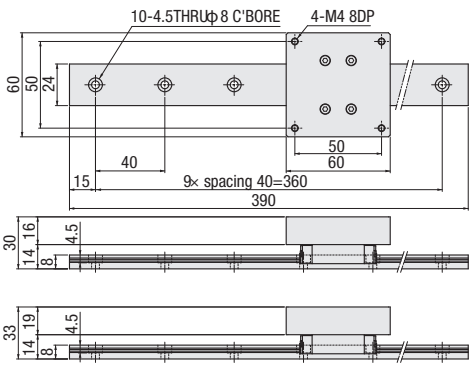
How to order

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

Notes:
- Combination with slideguide, adaptor plate or CAVE-X POSITIONER should be selected customer side.

※It is recommended to adjust in parallelism under 10μ m and within 100mm.
- Slide guide materials: Stainless.
  Adaptor plate materials: Aluminum.
- Grease: Multemp PS2.
- If you have any questions, feel free to contact us.

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



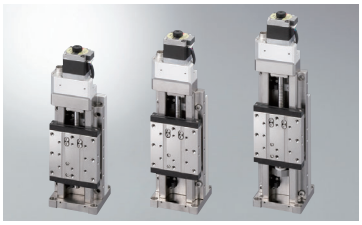
・For Uncovered model
APW6016A-390A

・For covered model
APW6019A-390A

CAVE-X POSITIONER

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

KZL06030-N/KZL06050-N/KZL06075-N



KZL06030-C/KZL06050-C/KZL06075-C

RoHS

Model: KZL06 | Selection code: 030-N1- | Option code: C□□

1 2 3 4 5 6

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

1 Travel length

030	30mm
050	50mm
075	75mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

1	Lead 1mm

4 Motor option

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

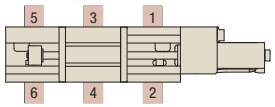
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

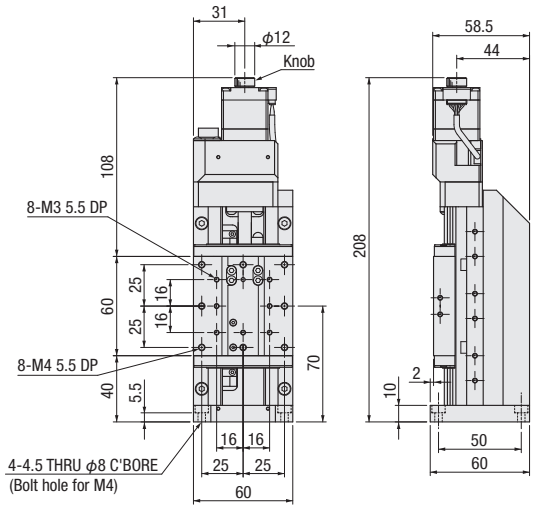
Model			Uncovered			Covered		
			KZL06030-N1-C	KZL06050-N1-C	KZL06075-N1-C	KZL06030-C1-C	KZL06050-C1-C	KZL06075-C1-C
Mechanical specification	Travel length		30mm	50mm	75mm	30mm	50mm	75mm
	Table size		60×60mm					
	Feed screw (Ball screw)		φ8 lead 1					
	Guide		Linear ball guide					
	Main materials-Finishing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

Single axis accuracy specification	Uni-directional positioning accuracy	Within 5μm		Within 7μm	Within 5μm	Within 7μm
	Repeatability positioning accuracy	Within ±0.5μm				
	Lost motion	Within 1μm				
	Backlash	Within 1μm				
	Straightness	Within 3μm				
	Pitching/Yawing	Within 20″/Within 15″				

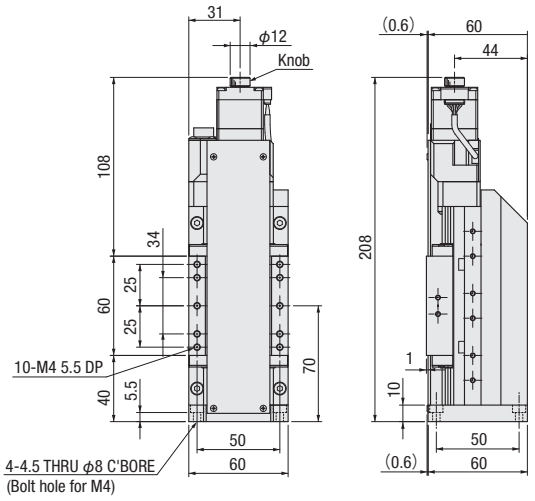
* Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

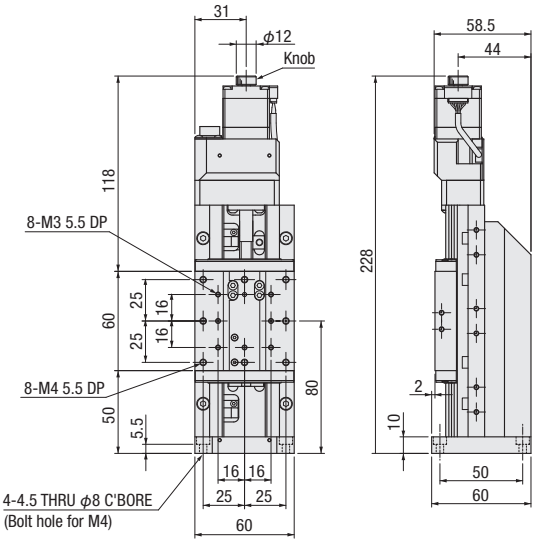
KZL06030-N1-C



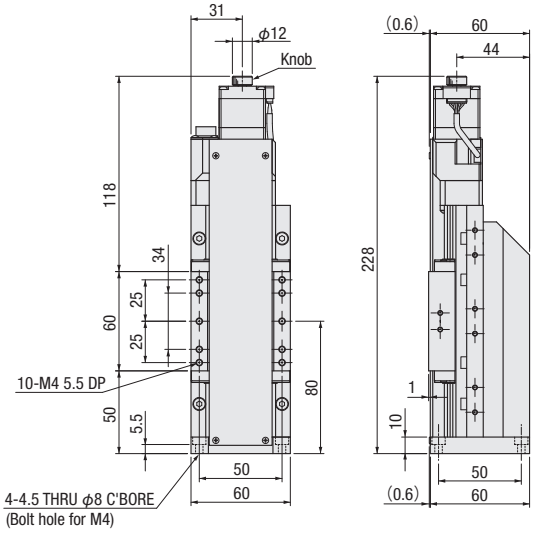
KZL06030-C1-C



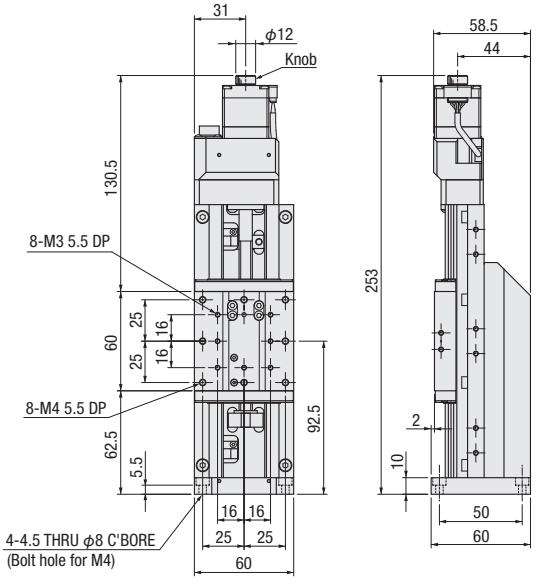
KZL06050-N1-C



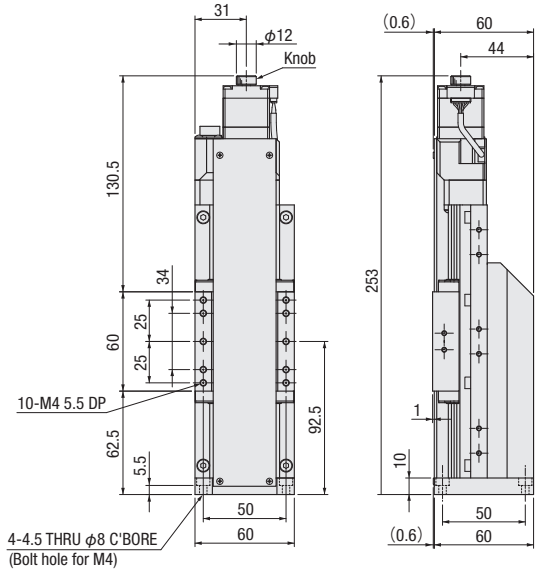
KZL06050-C1-C



KZL06075-N1-C

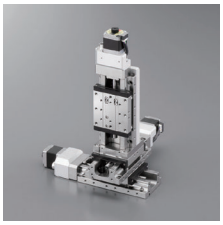


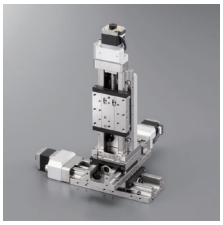
KZL06075-C1-C



CAVE-X POSITIONER

XYZ-axis Linear Ball Guide: KWL06030/KWL06050


KWL06030-N


KWL06050-N


KWL06030-C


KWL06050-C

RoHS

Model: KWL06 | Selection code: 030-N1- | Option code: C□□

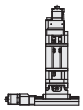
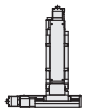
1 2 3 4 5 6

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

1 Travel length

030	30mm
050	50mm

2 Cover type

N	Uncovered	
C	Covered	

3 Ball screw lead selection

1	Lead 1mm

4 Motor option

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

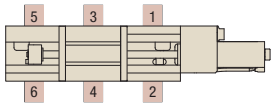
* Code MA · PA · UA is the set of driver and cable.
* See page P.1-077~ for details of motor option.

5 Origin sensor option

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

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

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



6 Cable option

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

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

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

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

SPEC

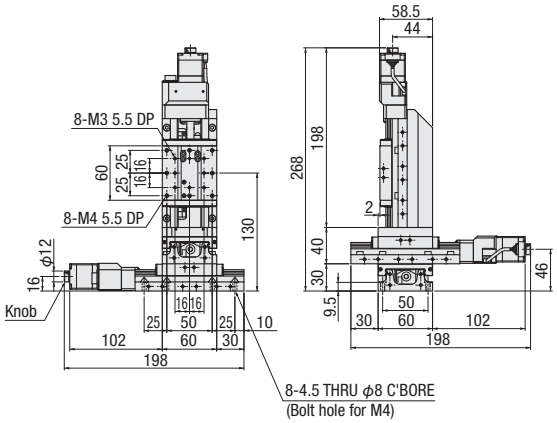
Model			Uncovered		Covered	
			KWL06030-N1-C	KWL06050-N1-C	KWL06030-C1-C	KWL06050-C1-C
Mechanical specification	Travel length		30mm	50mm	30mm	50mm
	Table size		60×60mm			
	Feed screw (Ball screw)		φ8 lead 1			
	Guide		Linear ball guide			
	Main materials-Finishing		Stainless–Opposite side of the end face finishing			
	Weight		4.56kg	4.92kg	4.74kg	5.04kg
Accuracy specification	Resolution (Pulse)	Full/Half	2μm/1μm			
		Microstep	0.1μm (1/20 on resolution)			
	MAX speed		20mm/sec			
	Load capacity		7kgf [68.6N]			
	Perpendicularity		Within 15μm/Full stroke	Within 25μm/Full stroke	Within 15μm/Full stroke	Within 25μm/Full stroke
Sensor	Limit sensor		Installed			
	Origin sensor		– *Attachable in origin sensor option			
	Slit origin sensor		–			
Provided screw (Hexagon-headed bolt)			8 of M4—14			

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
	Pitching/Yawing	Within 20″/Within 15″

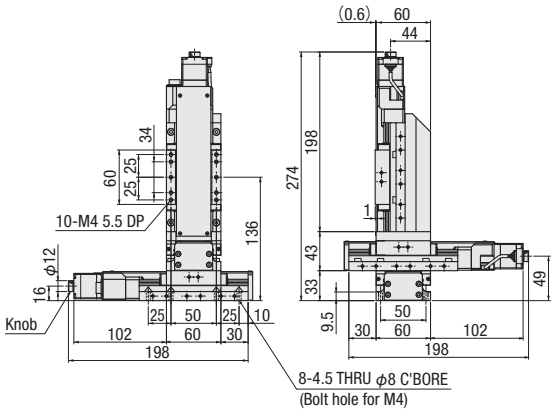
* Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

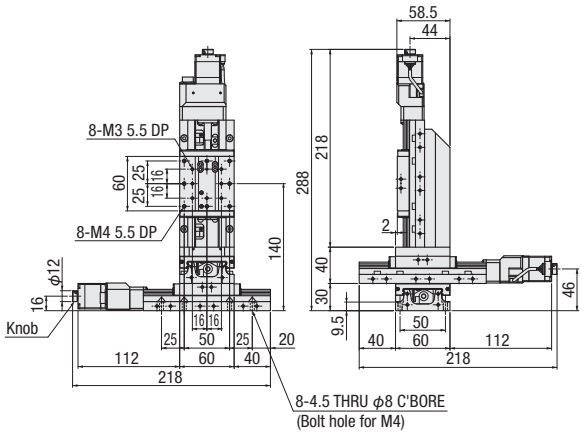
KWL06030-N1-C



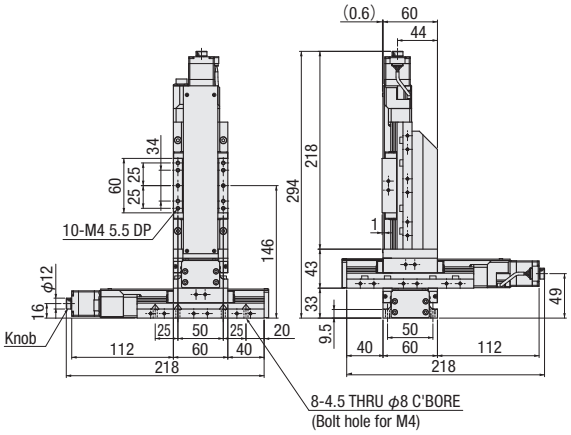
KWL06030-C1-C



KWL06050-N1-C



KWL06050-C1-C



Electrical Specification: KXL Series

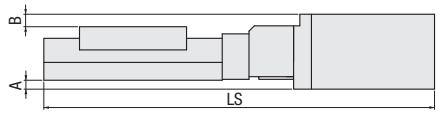
Motor • Electrical specification

Motor code				C	F	G	MA	PA	UA	
Models				KXL06030 / KXL06050 / KXL06075						
				KXL06100 / KXL06150 / KXL06200 / KXL06300						
MotorSpecification (*1)	Type			5 phase stepping motor 0.75A/Phase			5 phase 0.35A/Phase	α step motor	AC servo motor	
	Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed	
	Model (*2)			C005C-90215P	PK525HPB-C1	PK523HPMB-C1	PKE545MC-A1	ARM24SAK	HG-KR053	
	Electromagnetic brake			–			Installed	–		
	Maker			Oriental Motor Co., Ltd.					Mitsubishi Electric corporation	
	Step angle (Position detector)			0.72°		0.36°	0.72°	0.36° (Set to 1000P/R)	22 bits encoder (4194304P/R)	
	Mass			0.11kg	0.2kg	0.11kg	0.52kg	0.15kg	0.34kg	
	Motor size	□size		28mm			42mm	28mm	40mm	
		L size		42mm	61.5mm	42mm	69mm	45mm	66.4mm	
	Excitation (moment) maximum torque			0.041N • m	0.073N • m	0.038N • m	0.240N • m	0.055N • m	0.560N • m	
	Driver type			P.1-205～			RKSD503M-A	ARD-K	MR-J4-10A	
	Input power (Voltage • frequency)						Single phase AC100-120V 50/60Hz	DC24V±10%	Three and single phase AC200-240V 50/60Hz	
Sensor	Limit sensor			Installed						
	Origin sensor			– *Sensor should be PM-L25 (Panasonic Industrial Devices SUNX) when select the origin sensor						
	Slit origin sensor			–						
	Model			Micro Photoelectric Sensor PM-L25 (Panasonic Industrial Devices SUNX)						
	Power voltage			DC5～24V ±10%						
	Consumption current			Total 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)						
Connector	Motor	Model		HR10A-10R-12P (73) (Hirose Electric Co., Ltd.)			motor side: 5557-06R-210 electromagnetic brake side: 5557-02R-210 (MOLEX)	43025-1000 (Japan Molex)	Motor cable	–
									Encoder	–
		Receiving connector		HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)			motor side: 5559-06P-210 electromagnetic brake side: 5559-02P-210 (MOLEX)	43020-1000 (Japan Molex)	Motor cable	JN4FT04SJ1-R (JAE)
									Encoder	1674320-1 (Tyco Electronics Japan G.K.)
	Sensor	Model		HR10A-10R-12P (73) (Hirose Electric Co., Ltd.)※In common with a motor			HR10A-7J-6P (73) (Hirose Electric Co., Ltd.)			
		Receiving connector		HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)※In common with a motor			HR10A-7P-6S (73) (Hirose Electric Co., Ltd.)			
Accuracy specification	Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm/0.5μm	22 bits encoder (4194304P/R)	
			Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	–		
		Lead 2mm	Full/Half	4μm/2μm		2μm/1μm	4μm/2μm	2μm/1μm		
			Micro step (1/20 split)	0.2μm		0.1μm	0.2μm	–		
	Max. speed	Lead 1mm		30mm/sec	35mm/sec	25mm/sec	25mm/sec	40mm/sec	50mm/sec	
		Lead 2mm		35mm/sec	45mm/sec	30mm/sec	40mm/sec	80mm/sec	100mm/sec	

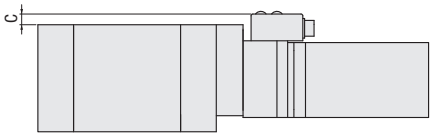
*1 See page P.1-213~ for details of single motor specification *2 Model is our own management model. * The electric specification of XY , Z, XYZ are the same.

Dimensional outline drawings

Side view



Top view



■Standard type

Motor code	Size □[mm]	A	B	C	LS 30	50	75	100	150	200	300
C	28	–	0.5	–	198	218	243	268	318	368	468
F	28	–	0.5	–	218	238	263	288	338	388	488
G	28	–	0.5	–	198	218	243	268	318	368	468
MA	42	5	7	6	245	265	290	315	365	415	515
PA	28	–	0.5	6	211	231	256	281	331	381	481
UA	40	4.7	6.5	6	240.4	260.4	285.4	310.4	360.4	410.4	510.4

■Covered type

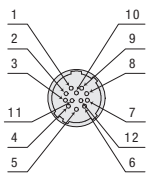
Motor code	Size □[mm]	A	B	C	LS 30	50	75	100	150	200	300
C	28	–	–	–	203	223	248	273	323	373	473
F	28	–	–	–	223	243	268	293	343	393	493
G	28	–	–	–	203	223	248	273	323	373	473
MA	42	5	4	6	250	270	295	320	370	420	520
PA	28	–	–	6	216	236	261	286	336	386	486
UA	40	4.7	3.5	6	245.4	265.4	290.4	315.4	365.4	415.4	515.4

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

Pin allocation・Connection diagram

C・F・G — Available for motor and sensor

[Motor and sensor pin allocation (the same)]



[Motor and sensor connection diagram (the same)]

1	Motor lead (Blue)	Blue
2	Motor lead (Red)	Red
3	Motor lead (Orange)	Orange
4	Motor lead (Green)	Green
5	Motor lead (Black)	Black
6	CWLS output	
7	CCWLS output	
8	Open	
9	Power input (+)	
10	ORG output	
11	Power input (-)	
12	F.G.	

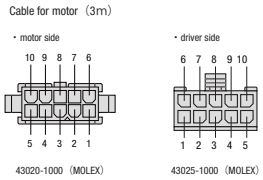
MOTOR

(Brown) CWLS: OUT1 (Black), OUT2 (White), (Blue)
(Brown) CCWLS: OUT1 (Black), OUT2 (White), (Blue)

*Cable must be selected from option code of each products.
See page ▶ P.1-207,209 for details of cable.

P・A — Motor

*Motor cable model:CC030VA2R2 See page ▶ P.1-212 for details.



1	Motor lead	W
2	Motor lead	B
3	Motor lead	P
4	Motor lead	B
5	Motor lead	G
6	Motor lead	R
7	Motor lead	G
8	Motor lead	B
9	Motor lead	O
10	Drain wire	

MOTOR

P・A — Sensor

[Motor and sensor pin allocation (sensor)]

[Motor and sensor connection diagram (sensor)]

1	CWLS output	
2	CCWLS output	
3	ORG output	
4	NORG output	
5	Power input (+)	
6	Power input (-)	

(Brown) CWLS: OUT1 (Black), OUT2 (White), (Blue)
(Brown) CCWLS: OUT1 (Black), OUT2 (White), (Blue)

*Cable model:HR10AP-S-SB-6-2 See page ▶ P.1-214 for details

Sensor side

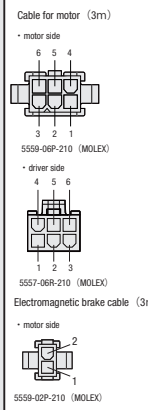
Pin	Signals
1	CWLS
2	CCWLS
3	ORG
4	NORG
5	V+
6	V–

Orange / Black dot, Orange / Red dot, Gray / Black dot, Gray / Red dot, White / Black dot, White / Red dot, Shield

* The shields are connected with the connector shell.

M・A — Motor

*Motor cable model:CC030VPFB See page ▶ P.1-213 for details.



1	Motor lead	B
2	Motor lead	R
3	Motor lead	Y
4	Motor lead	B
5	Motor lead	O
6	Motor lead	G

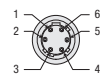
MOTOR

1	Electromagnetic brake	W
2	Electromagnetic brake	B

Electromagnetic brake

M・A — Sensor

[Motor and sensor pin allocation (sensor)]



[Motor and sensor connection diagram (sensor)]

1	CWLS output	
2	CCWLS output	
3	ORG output	
4	NORG output	
5	Power input (+)	
6	Power input (-)	

(Brown) CWLS: OUT1 (Black), OUT2 (White), (Blue)
(Brown) CCWLS: OUT1 (Black), OUT2 (White), (Blue)

*Cable model:HR10AP-S-SB-6-2 See page ▶ P.1-214 for details.

Sensor side

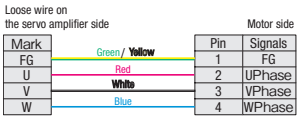
Pin	Signals
1	CWLS
2	CCWLS
3	ORG
4	NORG
5	V+
6	V–

Orange / Black dot, Orange / Red dot, Gray / Black dot, Gray / Red dot, White / Black dot, White / Red dot, Shield

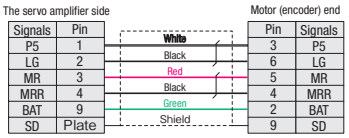
* The shields are connected with the connector shell.

U・A — Motor

*Motor cable model:SVPM-J3HF1-B-3-02SSee page ▶ P.1-211 for details.

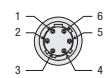


*encoder cable model:SVEM-J3HF1-B-3 See page ▶ P.1-211 for details.



U・A — Sensor

[Motor and sensor pin allocation (sensor)]



[Motor and sensor connection diagram (sensor)]

1	CWLS output	
2	CCWLS output	
3	ORG output	
4	NORG output	
5	Power input (+)	
6	Power input (-)	

(Brown) CWLS: OUT1 (Black), OUT2 (White), (Blue)
(Brown) CCWLS: OUT1 (Black), OUT2 (White), (Blue)

*Cable model:HR10AP-S-SB-6-2 See page ▶ P.1-214 for details.

Sensor side

Pin	Signals
1	CWLS
2	CCWLS
3	ORG
4	NORG
5	V+
6	V–

Orange /Black dot, Orange /Red dot, Gray /Black dot, Gray /Red dot, White/Black dot, White/Red dot, Shield

* The shields are connected with the connector shell.

Cable type

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

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

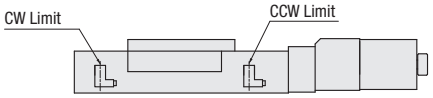
■Motor code [MA・PA・UA] compatible cable

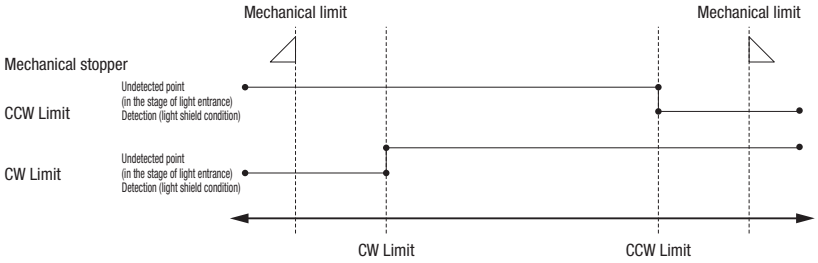
One set for motor driver and motor cable(encoder)

Motor code	Cable code	Driver type	Motor cable	Encoder cable	Sensor cable
MA	M	RKSD503M-A (Oriental Motor Co., Ltd.)	CC030VPFB ▶ P.1-213「Motor code MA」	—	HR10AP-S-SB-6-2 ▶ P.1-214 Refer sensor connection diagram
PA	P	ARD-K (Oriental Motor Co., Ltd.)	CC030VA2R2 ▶ P.1-212「Motor code PA」	—	
UA	U	MR-J4-10A (Mitsubishi Electric corporation)	SVPM-J3HF1-B-3-02S ▶ P.1-211「Motor code UA」	SVEM-J3HF1-B-3 ▶ P.1-211「Motor code UA」	

Electrical Specification: KXL Series

Timing chart





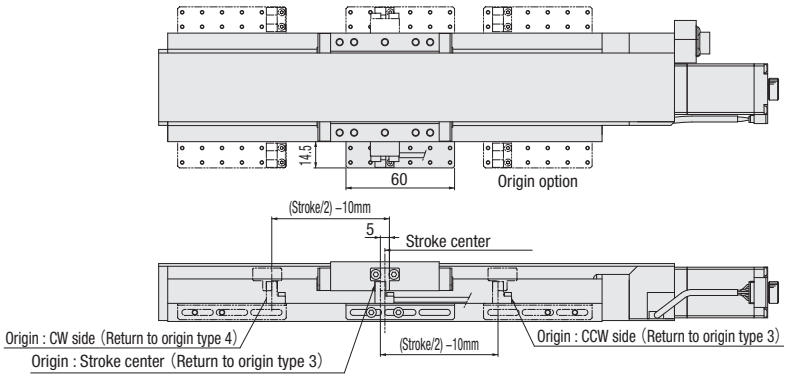
Unit [mm] Direction of CW ◄——► Direction of CCW

	Reference coordinate	Mechanical limit	CW Limit	CCW Limit	Mechanical limit
KXL06030	Stroke center	17.5	15.5	15.5	17.5
KXL06050	Stroke center	27.5	25.5	25.5	27.5
KXL06075	Stroke center	40	37.5	37.5	40
KXL06100	Stroke center	52.5	50.5	50.5	52.5
KXL06150	Stroke center	77.5	75.5	75.5	77.5
KXL06200	Stroke center	102.5	100.5	100.5	102.5
KXL06300	Stroke center	152.5	150.5	150.5	152.5

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

Sensor option dimensions

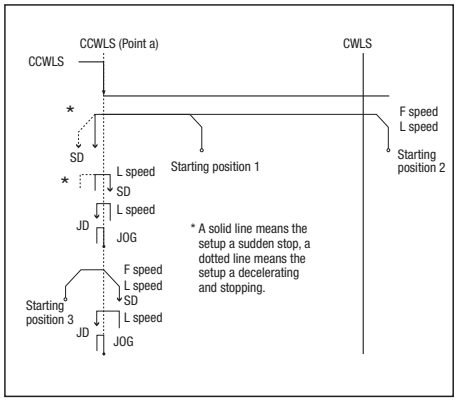


KXL series recommendation return to origin method

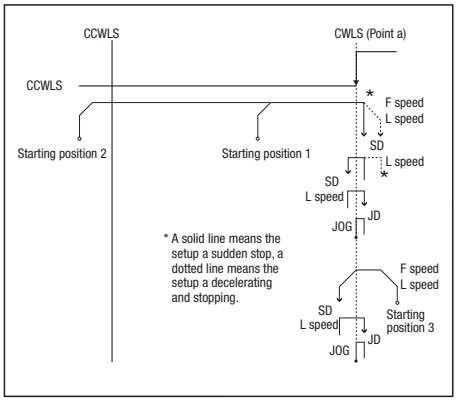
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be work correctly. Set to the way of recommendation return origin when using our controller.

■ Origin sensor option when not use

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



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

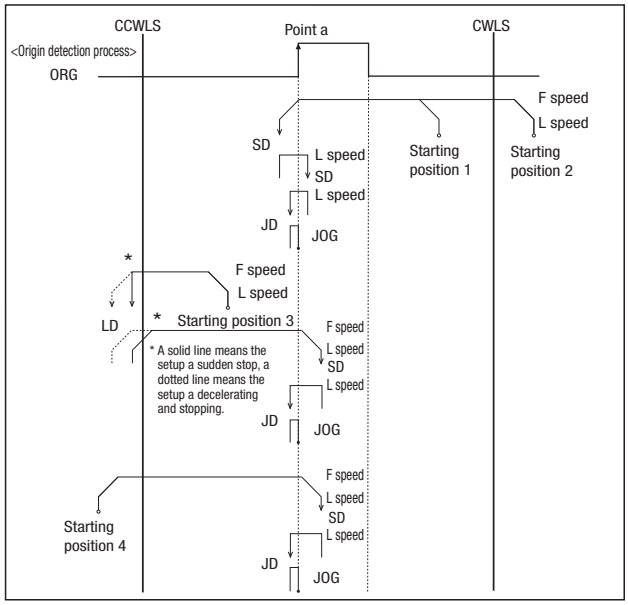


【Type11】
After finished type5, perform detected process for CCW edge of TIMING signal.

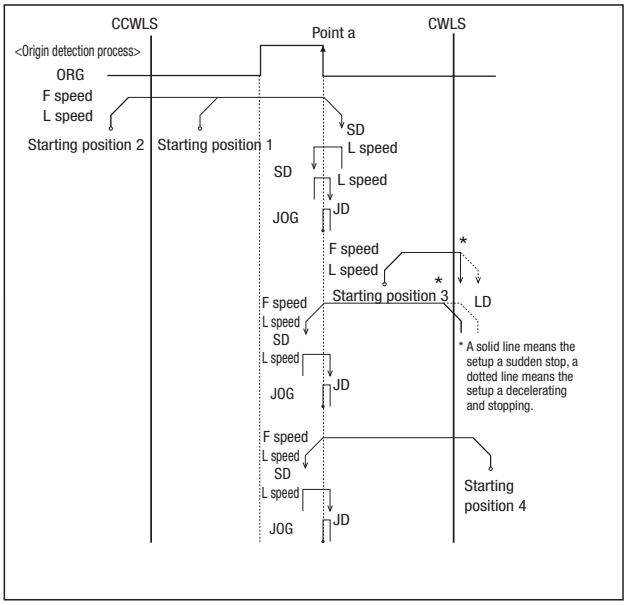
【Type12】
After finished type6, perform detected process for CW edge of TIMING signal.

■ Origin sensor option when use

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



[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 senquence P.1-201～

Adaptive driver

■ Driver P.1-205～

DC24V type input

Model	CVD507-K-A9	CRD5107P
Divisions	1~1/250 (16 steps)	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	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO

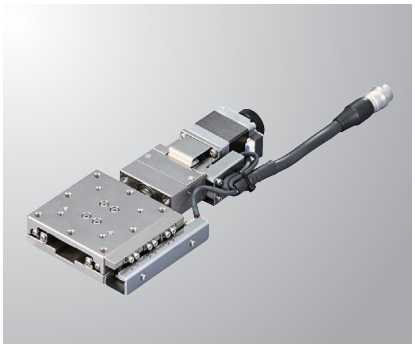

DS112/102

PG series

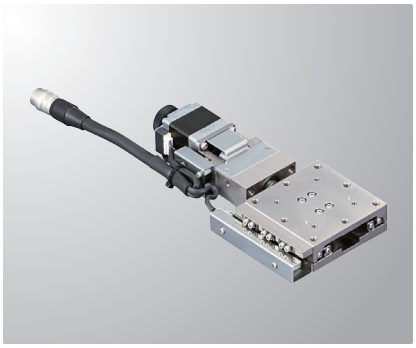
SURUGA SEIKI

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

PG615-L



PG615-R



RoHS

Model: PG

Selection code: 413-L05AG-

Option code: C 5

1 2 3 4 5 6 7

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

1 Table size

4	□40mm
5	□50mm
6	□60mm
7	□70mm

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

2 Travel length

13	13mm
15	15mm

3 Sensor cover location

L	L position 
R	Opposite hand 

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

5 Sensor logic

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

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

6 Motor option

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

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

7 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

Model		PG413-L05AG-C5	PG513-L05AG-C5	PG615-L05AG-C5	PG715-L05AG-C5
(Opposite hand)		PG413-R05AG-C5	PG513-R05AG-C5	PG615-R05AG-C5	PG715-R05AG-C5
Mechanical specification	Travel length	13mm		15mm	
	Table size	40×40mm	50×50mm	60×60mm	70×70mm
	Feed screw (Ball screw)	φ6 lead 1			
	Guide	Linear ball guide			
	Main materials-Finishing	Stainless–Opposite side of the end face finishing			
	Weight	0.5kg	0.6kg	0.7kg	0.9kg
Accuracy specification	Resolution (Pulse)	2μm (Full)/1μm (Half)			
	MAX speed	10mm/sec			
	Uni-directional positioning accuracy	Within 6μm			
	Repeatability positioning accuracy	Within ±0.5μm			
	Load capacity	10kgf [98N]			
	Moment stiffness	Pitch 0.22/yaw 0.17/ roll 0.12 ["/N・cm]	Pitch 0.14/yaw 0.10/ roll 0.06 ["/N・cm]	Pitch 0.08/yaw 0.07/ roll 0.03 ["/N・cm]	Pitch 0.03/yaw 0.03/ roll 0.01 ["/N・cm]
	Lost motion	Within 1μm			
	Backlash	Within 0.5μm			
	Straightness	Within 1μm			
	Parallelism	Within 15μm			
	Motion parallelism	Within 5μm			
	Pitching/Yawing	Within 15"/Within 10"			
Sensor	Limit sensor	Installed			
	Origin sensor (ORG1)	Installed			
	Slit origin sensor (ORG2)	Installed See page P.1-039~			
Provided screw (Hexagon-headed bolt)		4 of M3—8		4 of M4—8	

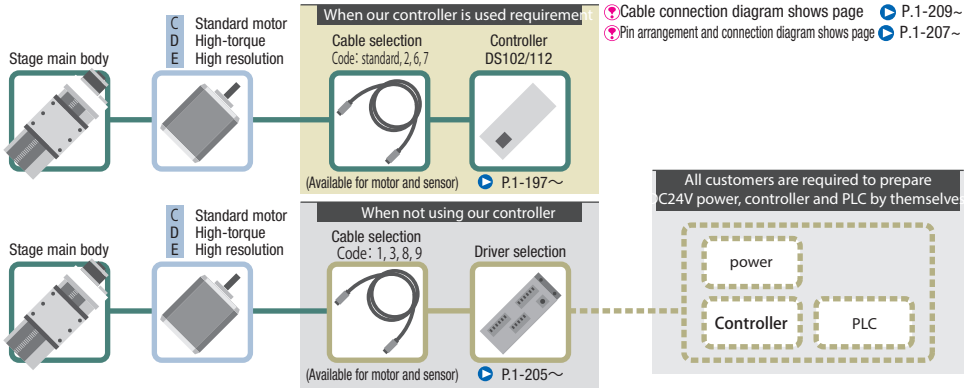
※ Might be changed specification due to motors. See page P.1-213~ for details.

Motor option

C Standard motor
Motor model
PK523HPB-C15

D High-torque
Motor model
PK525HPB

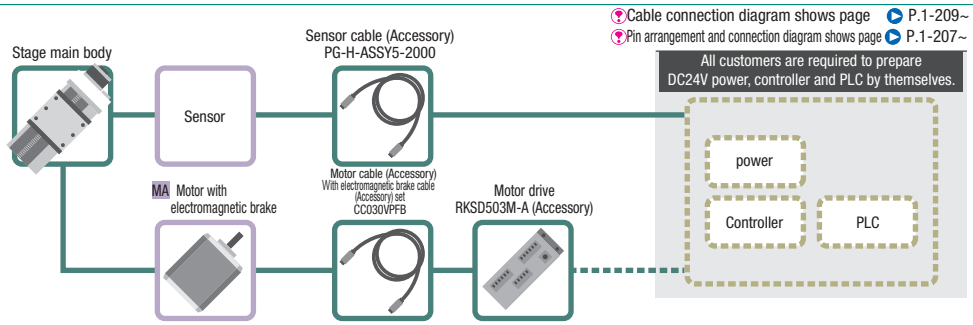
E High resolution
Motor model
PK523HPMB



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

Motor option

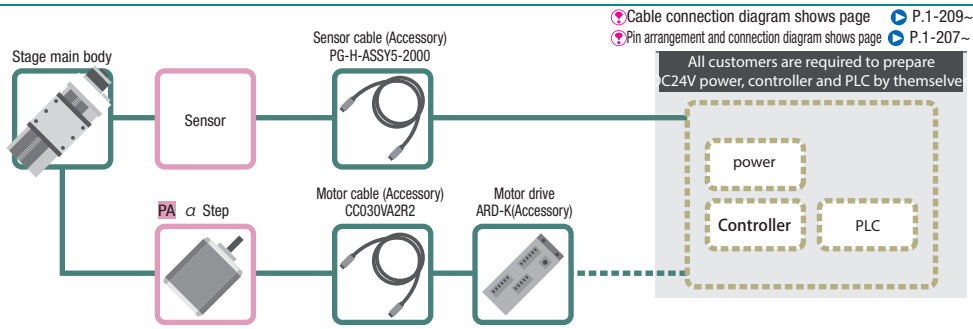
MA With electromagnetic brake
Motor model
PKE545MC-A1



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

Motor option

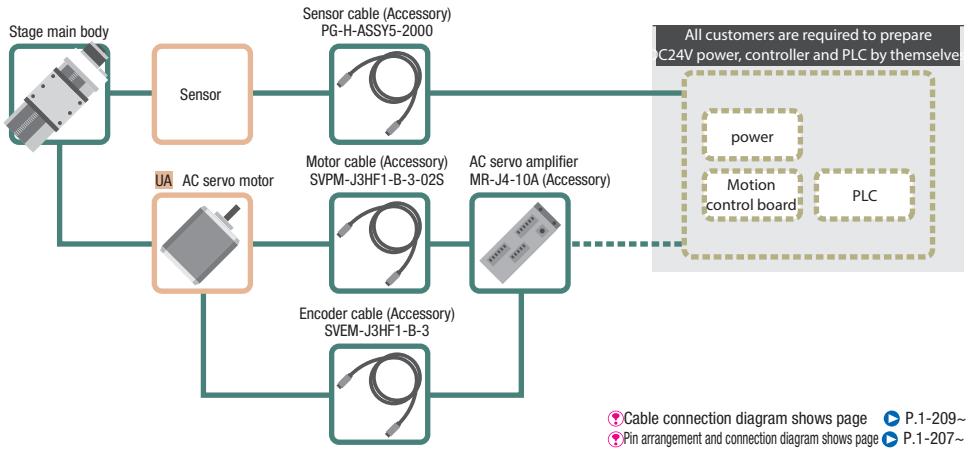
PA α Step
Motor model
ARM24SAK



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

Motor option

UA AC servo motor
Motor model
HG-KR053



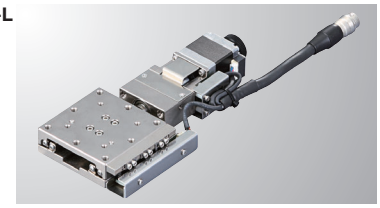
Cable connection diagram shows page P.1-209~
Pin arrangement and connection diagram shows page P.1-207~

Motor code			C	D	E	MA	PA	UA
Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type			5 phase stepping motor 0.75A/Phase			5 phase 0.35A/Phase	α step motor	AC servo motor
Model*			**PK525HPB-C15**	**PK525HPB**	**PK523HPMB**	**PKE545MC-A1**	**ARM24SAK**	**HG-KR053**
Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm (Set to 1000P/R)	22 bits encoder (4194304P/R)
		Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	–	
MAX speed	Lead 1mm		10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec	50mm/sec

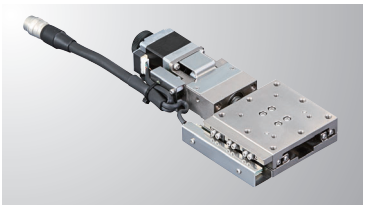
* Model is our own management model.

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

PG615-L

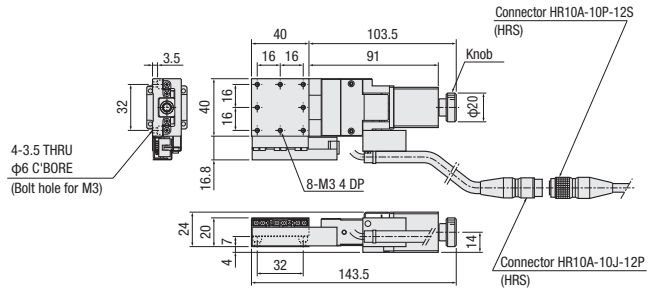


PG615-R

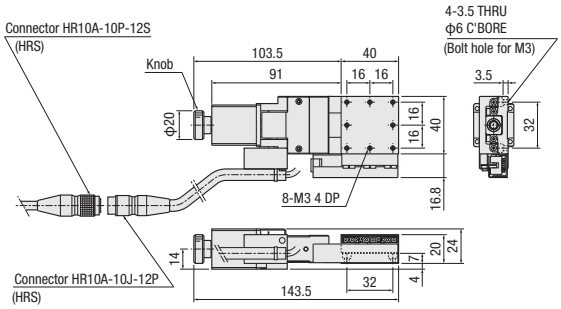


Dimensional outline drawings

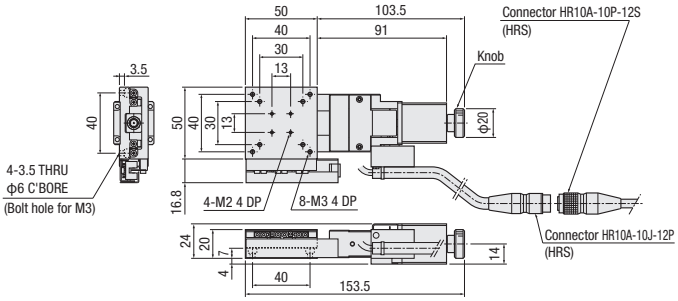
PG413-L



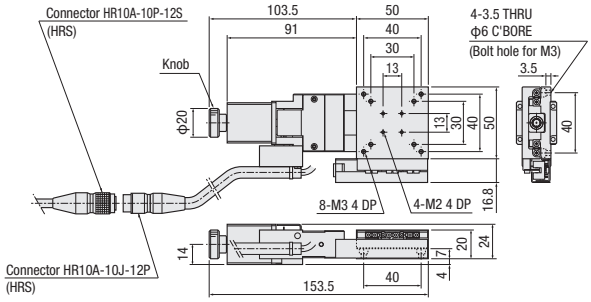
PG413-R



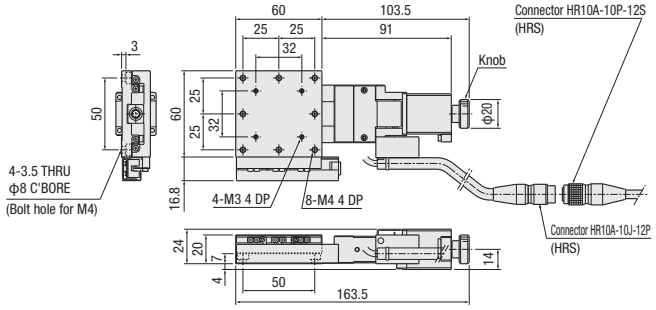
PG513-L



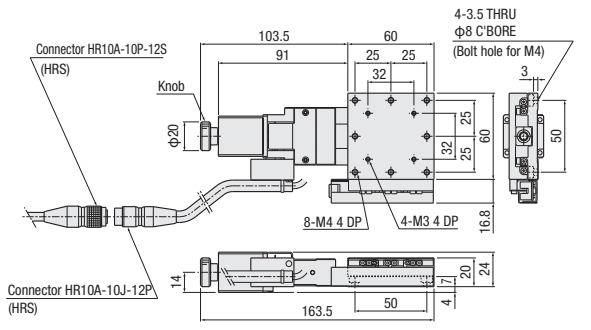
PG513-R



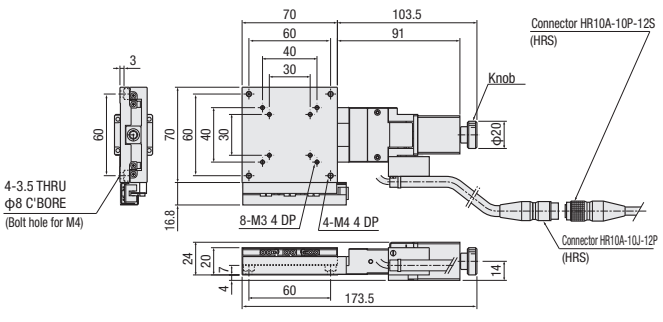
PG615-L



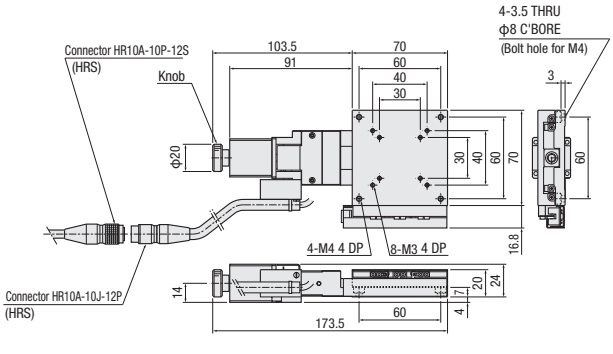
PG615-R



PG715-L



PG715-R



Dimensional outline drawings

C Standard motor

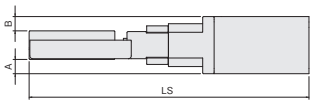
Motor model PK525HRB-C15

D High-torque

Motor model PK525HPB

E High resolution

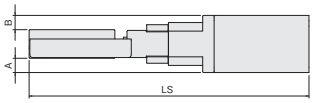
Motor model PK523HPMB



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

MA With electromagnetic brake

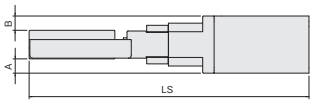
Motor model PKE545MC-A1



Model	MA (With electromagnetic brake)			C (Standard)	
	Motor size	A	B	LS	
PG413-∗∗∗∗-MA	□42	11	11	180	143.5
PG513-∗∗∗∗-MA				190	153.5
PG615-∗∗∗∗-MA				200	163.5
PG715-∗∗∗∗-MA				210	173.5

PA α step

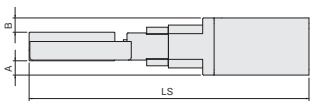
Motor model ARM24SAK



Model	PA (α step)			C (Standard)	
	Motor size	A	B	LS	
PG413-∗∗∗∗-PA	□28	4	4	144	143.5
PG513-∗∗∗∗-PA				154	153.5
PG615-∗∗∗∗-PA				164	163.5
PG715-∗∗∗∗-PA				174	173.5

UA AC servo motor

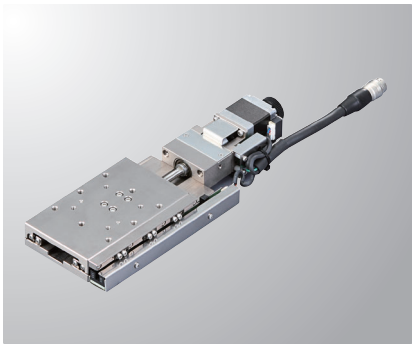
Motor model HG-KR053



Model	UA (AC servo motor)			C(Standard)	
	Motor size	A	B	LS	
PG413-∗∗∗∗-UA	□40	10.7	10.5	175.9	143.5
PG513-∗∗∗∗-UA				185.9	153.5
PG615-∗∗∗∗-UA				195.9	163.5
PG715-∗∗∗∗-UA				205.9	173.5

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

PG650-L



PG650-R

RoHS

Model: PG430-L05AG-C5

Selection code: 1 2 3 4 5 — Option code: 6 7

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

1 Table size

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

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

2 Travel length

30	30mm
50	50mm

3 Sensor cover location

L	L position 
R	Opposite hand 

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

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

5 Sensor logic

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

6 Motor option

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

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

7 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

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

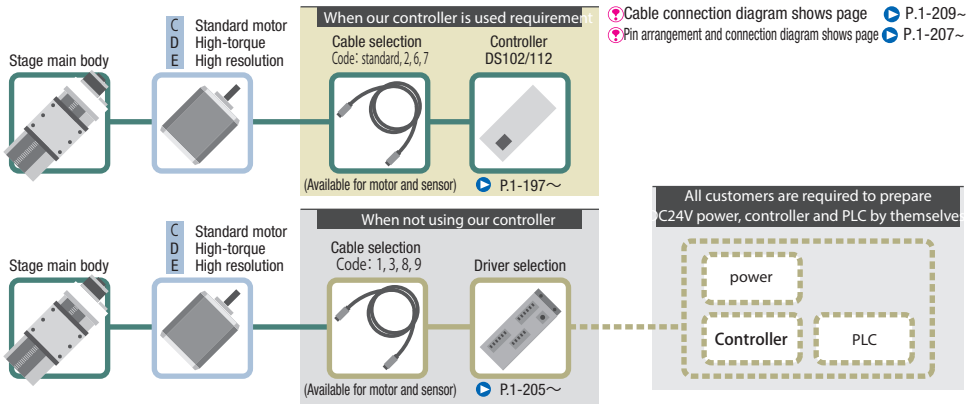
※ Specification will be changed due to a motor. Refer page P.1-213.
The vertical load guideline 5kgf when use on Z-axis because of difference the load or speed.

Motor option

C Standard motor
Motor model
PK523HPB-C15

D High-torque
Motor model
PK525HPB

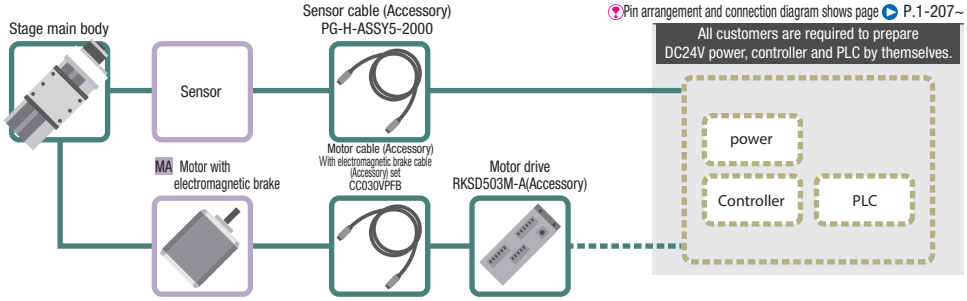
E High resolution
Motor model
PK523HPMB



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

Motor option

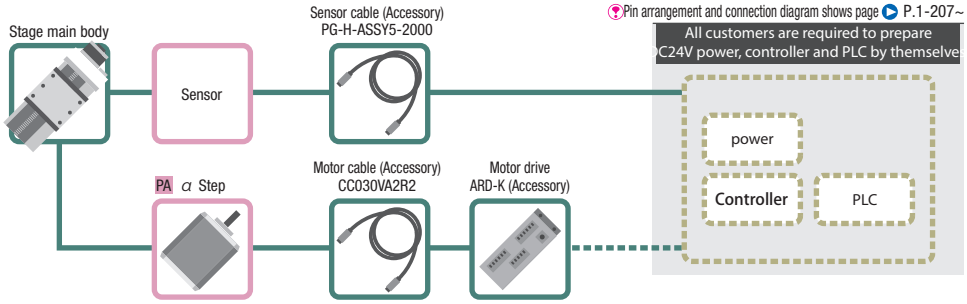
MA With electromagnetic brake
Motor model
PKE545MC-A1



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

Motor option

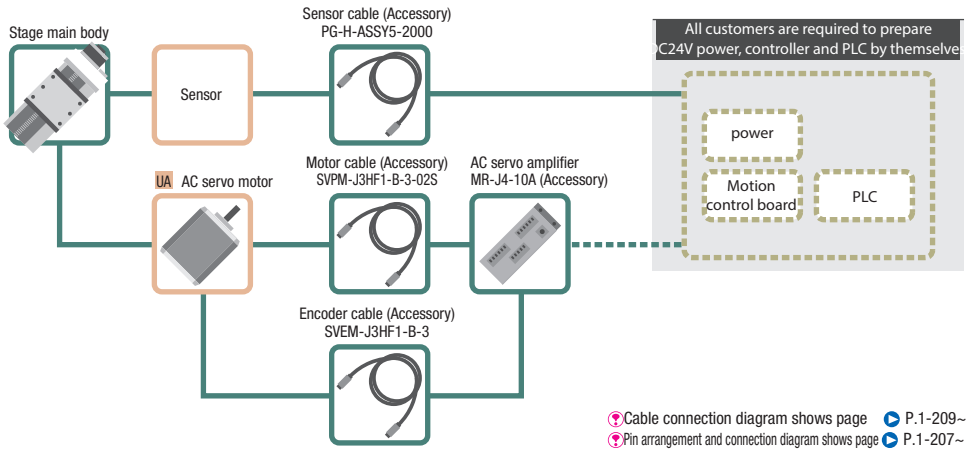
PA α Step
Motor model
ARM24SAK



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

Motor option

UA AC servo motor
Motor model
HG-KR053



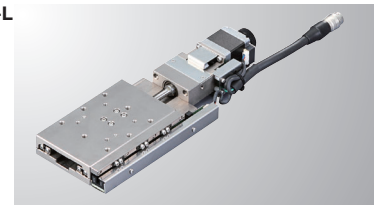
Cable connection diagram shows page P.1-209~
Pin arrangement and connection diagram shows page P.1-207~

Motor code			C	D	E	MA	PA	UA
Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed
Type			5 phase stepping motor 0.75A/Phase			5 phase 0.35A/Phase	α step motor	AC servo motor
Model*			**PK523HPB-C15**	**PK525HPB**	**PK523HPMB**	**PKE545MC-A1**	**ARM24SAK**	**HG-KR053**
Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm (Set to 1000P/R)	22 bits encoder (4194304P/R)
		Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	–	
MAX speed	Lead 1mm		10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec	50mm/sec

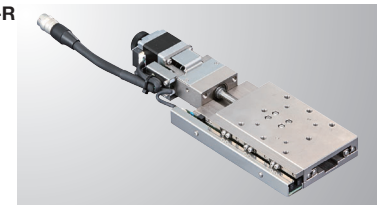
* Model is our own management model.

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

PG650-L

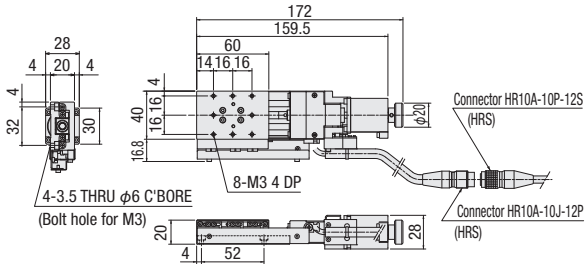


PG650-R

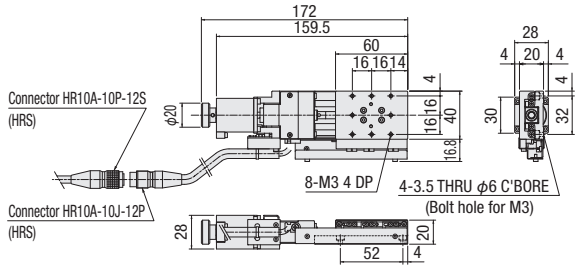


Dimensional outline drawings

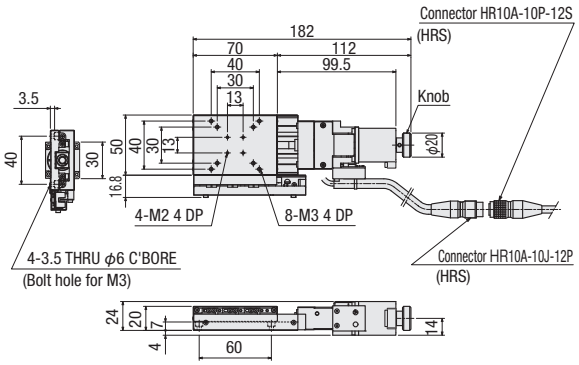
PG430-L



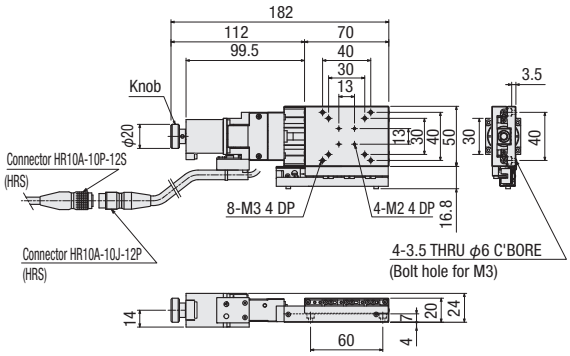
PG430-R



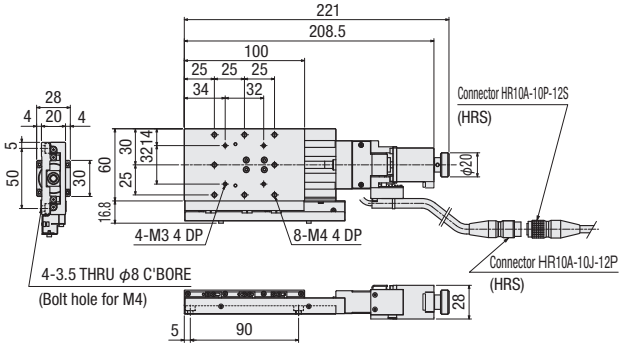
PG530-L



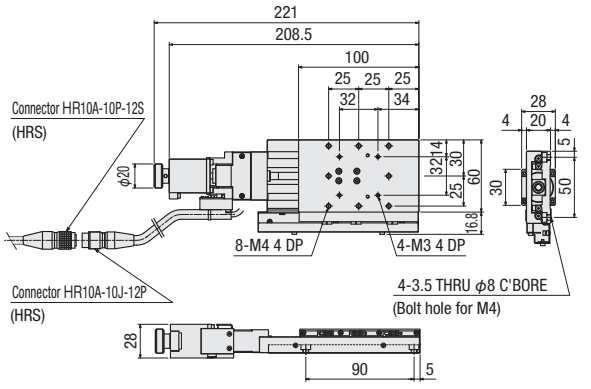
PG530-R



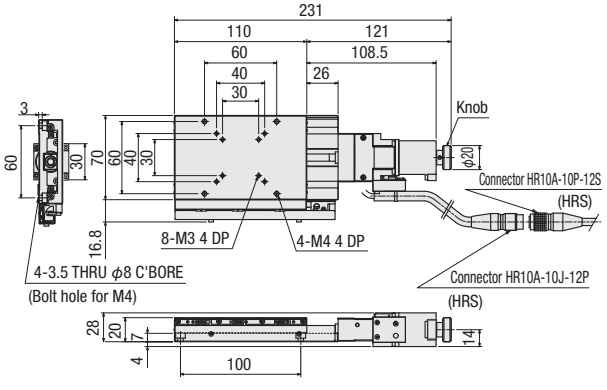
PG650-L



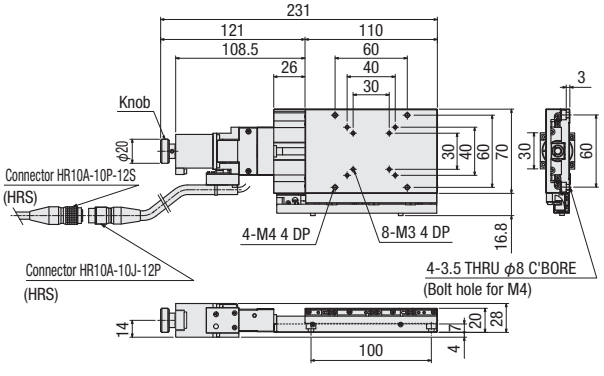
PG650-R



PG750-L



PG750-R



Dimensional outline drawings

C Standard motor

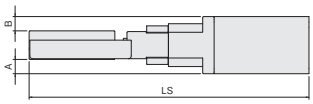
Motor model PK525HPB-C15

D High-torque

Motor model PK525HPB

E High resolution

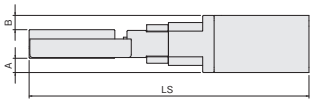
Motor model PK523HPMB



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

MA With electromagnetic brake

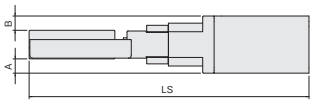
Motor model PKE545MC-A1



Model	MA (With electromagnetic brake)			C (Standard)
	Motor size	A	B	LS
PG430-∗∗∗∗-MA	□42	11	11	208.5	172
PG530-∗∗∗∗-MA				218.5	182
PG650-∗∗∗∗-MA				257.5	221
PG750-∗∗∗∗-MA				267.5	231

PA α step

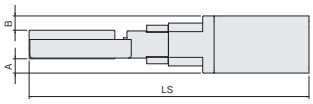
Motor model ARM24SAK



Model	PA (α step)			C(Standard)
	Motor size	A	B	LS
PG430-∗∗∗∗-PA	□28	4	4	172.5	172
PG530-∗∗∗∗-PA				182.5	182
PG650-∗∗∗∗-PA				221.5	221
PG750-∗∗∗∗-PA				231.5	231

UA AC servo motor

Motor model HG-KR053

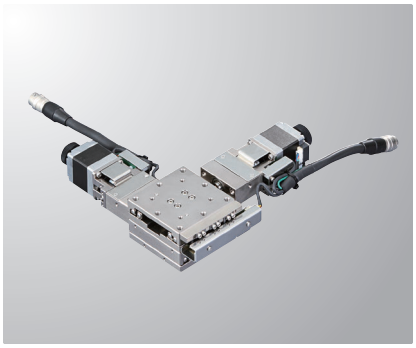


Model	UA (AC servo motor)			C (Standard)
	Motor size	A	B	LS
PG430-∗∗∗∗-UA	□40	10.7	10.5	204.4	172
PG530-∗∗∗∗-UA				214.4	182
PG650-∗∗∗∗-UA				253.4	221
PG750-∗∗∗∗-UA				263.4	231

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

PMG615-L

PMG615-R



RoHS

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

Model: PMG413-L05AL-C5

Selection code: 413-L05AL-

Option code: C5

1 2 3 4 5 6 7 8

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

1 Table size

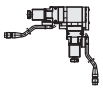
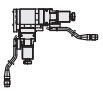
4	□40mm
5	□50mm
6	□60mm
7	□70mm

2 Travel length

13	13mm
15	15mm

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

3 6 Identification mark

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

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

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

5 Sensor logic

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

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

7 Motor option

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

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

8 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

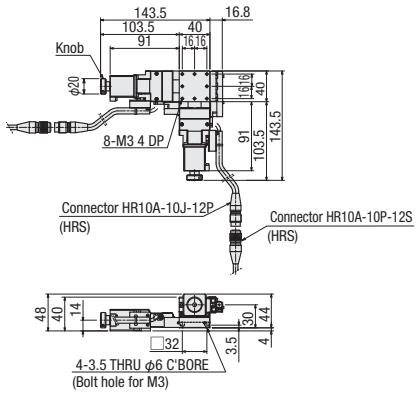
Model		PMG413-L05AL-C5	PMG513-L05AL-C5	PMG615-L05AL-C5	PMG715-L05AL-C5
(Opposite hand)		PMG413-R05AR-C5	PMG513-R05AR-C5	PMG615-R05AR-C5	PMG715-R05AR-C5
Mechanical specification	Travel length	13mm		15mm	
	Table size	40×40mm	50×50mm	60×60mm	70×70mm
	Feed screw (Ball screw)	φ6 lead 1			
	Guide	Linear ball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

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

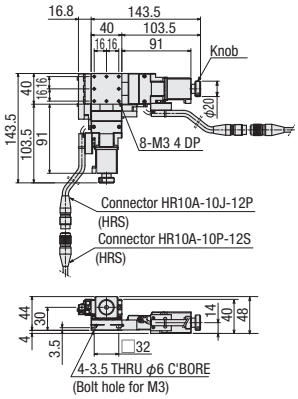
※ Might be changed specification due to motors P.1-213～.

Dimensional outline drawings

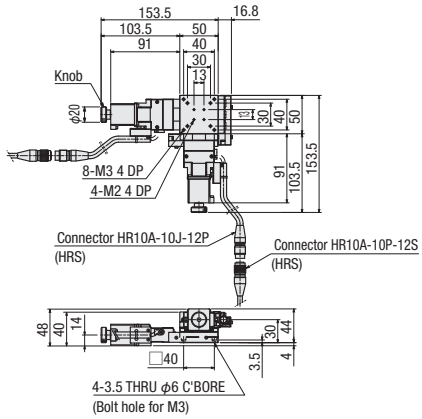
PMG413-L



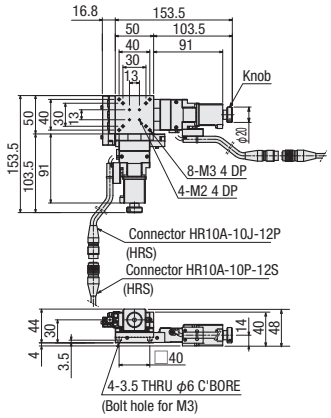
PMG413-R



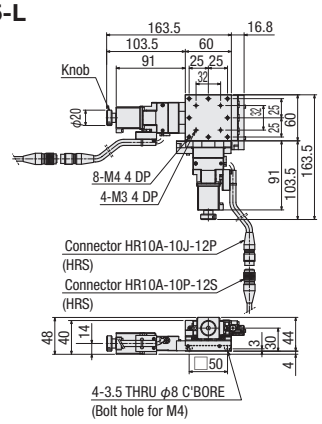
PMG513-L



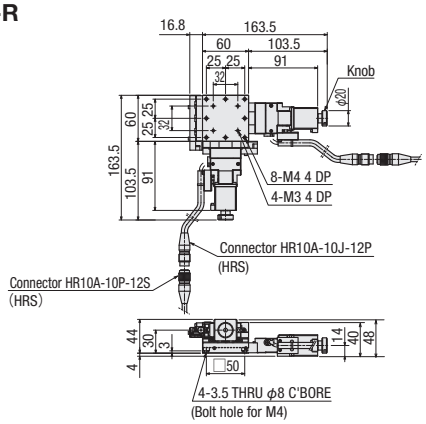
PMG513-R



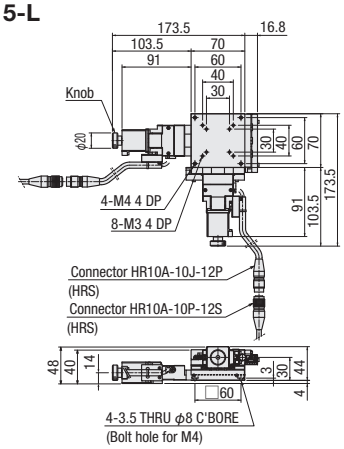
PMG615-L



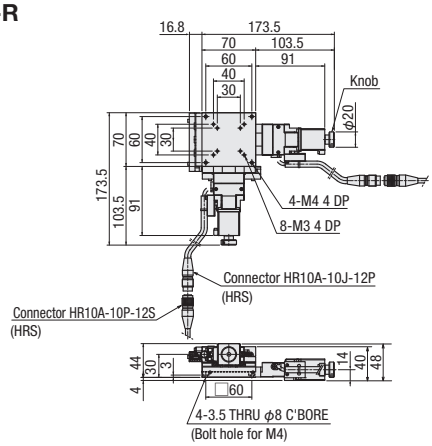
PMG615-R



PMG715-L



PMG715-R



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

PMG650-L

PMG650-R

RoHS

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

Model / Selection code / Option code

PMG 430-L05AL-C5

1 2 3 4 5 6 7 8

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

1 Table size

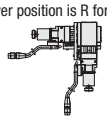
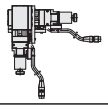
4	40×60mm
5	50×70mm
6	60×100mm
7	70×110mm

2 Travel length

30	30mm
50	50mm

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

3 6 Identification mark

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

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

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

5 Sensor logic

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

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

7 Motor option

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

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

8 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

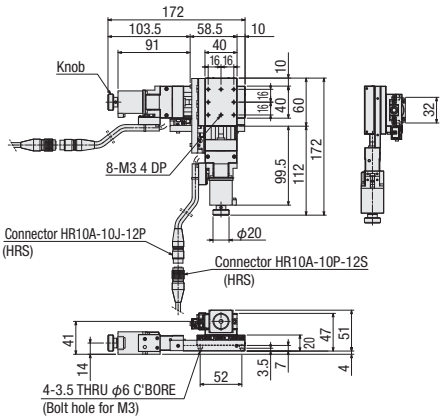
Model		PMG430-L05AL-C5	PMG530-L05AL-C5	PMG650-L05AL-C5	PMG750-L05AL-C5
(Opposite hand)		PMG430-R05AR-C5	PMG530-R05AR-C5	PMG650-R05AR-C5	PMG750-R05AR-C5
Mechanical specification	Travel length	30mm		50mm	
	Table size	40×60mm	50×70mm	60×100mm	70×110mm
	Feed screw (Ball screw)	φ6 lead 1			
	Guide	Linear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

Single axis accuracy specification	Uni-directional positioning accuracy	Within 12μm
	Repeatability positioning accuracy	Within ±0.5μm
	Lost motion	Within 1μm
	Backlash	Within 0.5μm
	Straightness	Within 2μm
	Pitching/Yawing	Within 20″/Within 15″

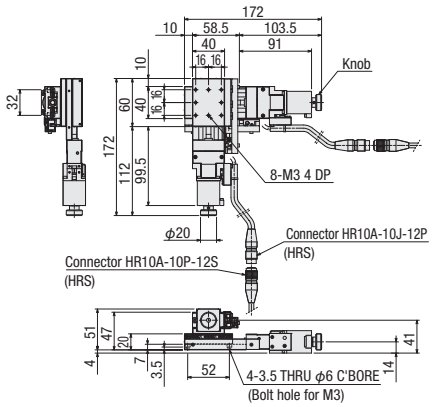
Note : PMG430,530,650,750 includes spacer for XY mouting.
※ Might be changed specification due to motors P.1-213～.

Dimensional outline drawings

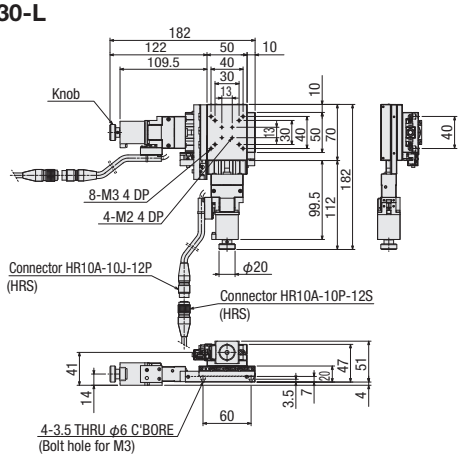
PMG430-L



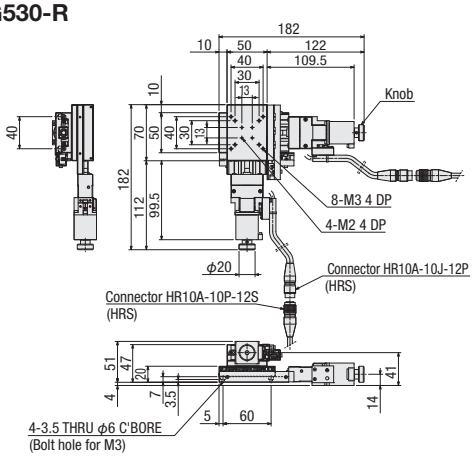
PMG430-R



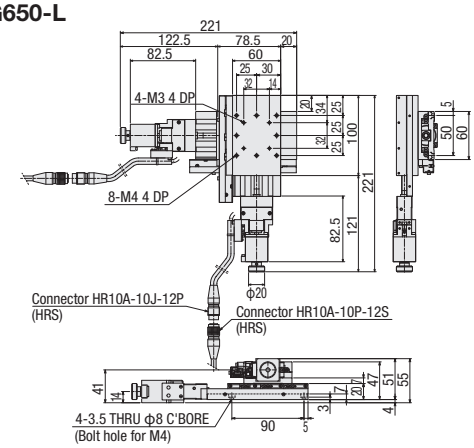
PMG530-L



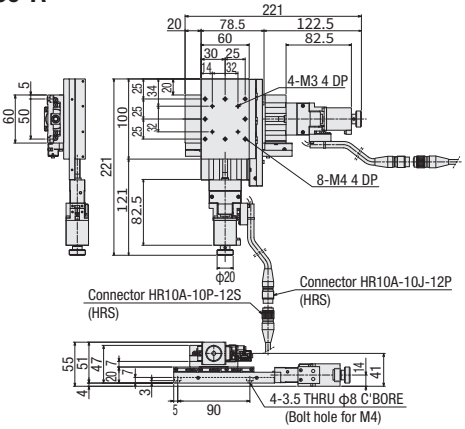
PMG530-R



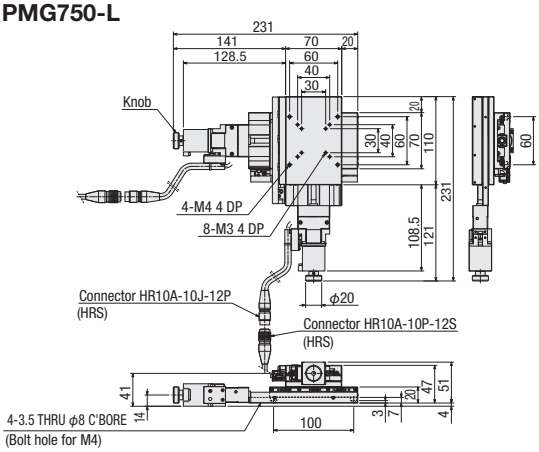
PMG650-L



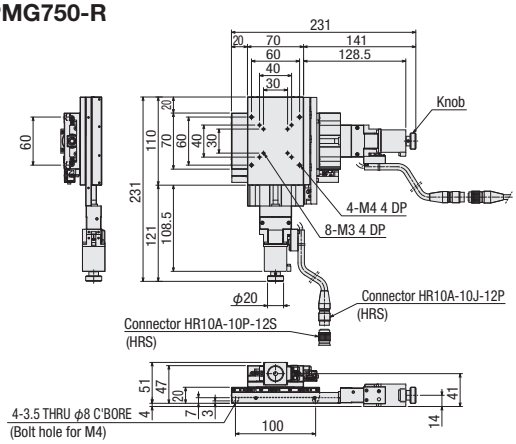
PMG650-R



PMG750-L



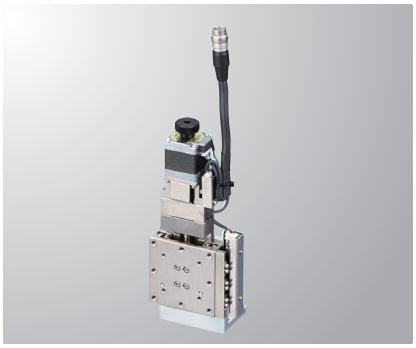
PMG750-R



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

PZG615-L

PZG615-R



RoHS

Model: PZG413-L05AG-C5

1	2	3	4	5	6	7
PZG	413	-	L05	AG	-	C	5

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

1 Table size

4	□40mm
5	□50mm
6	□60mm
7	□70mm

2 Travel length

13	13mm
15	15mm

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

3 Sensor cover location

L	L position 
R	Opposite hand 

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

5 Sensor logic

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

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

6 Motor option

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

* Code MA · PA · UA is the set of driver and cable.
* See page P.1-037~ for details of motor option.
[M/P]; Please see our web site for more details about motors.

7 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

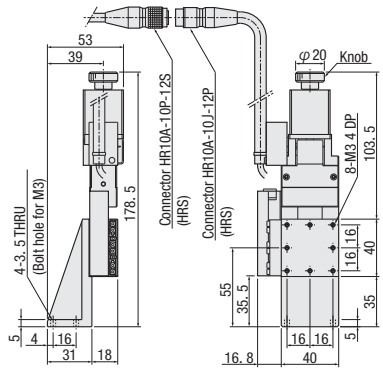
Model (Opposite hand)		PZG413-L05AG-C5 (PZG413-R05AG-C5)	PZG513-L05AG-C5 (PZG513-R05AG-C5)	PZG615-L05AG-C5 (PZG615-R05AG-C5)	PZG715-L05AG-C5 (PZG715-R05AG-C5)
Mechanical specification	Travel length	13mm		15mm	
	Table size	40×40mm	50×50mm	60×60mm	70×70mm
	Feed screw (Ball screw)	ϕ6 lead 1			
	Guide	Linear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

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

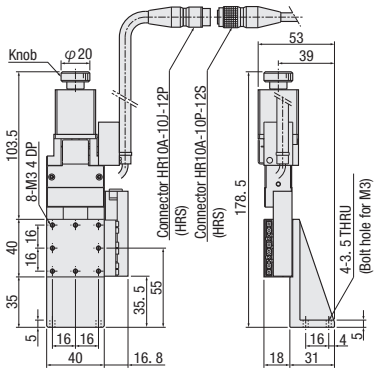
※ Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

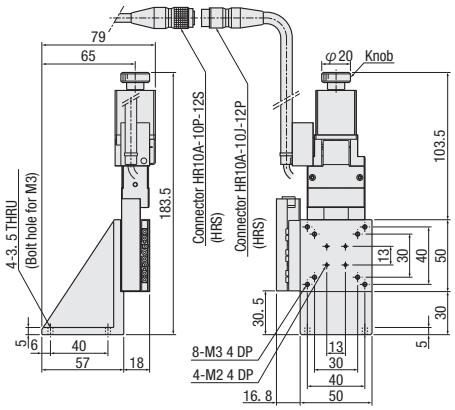
PZG413-L



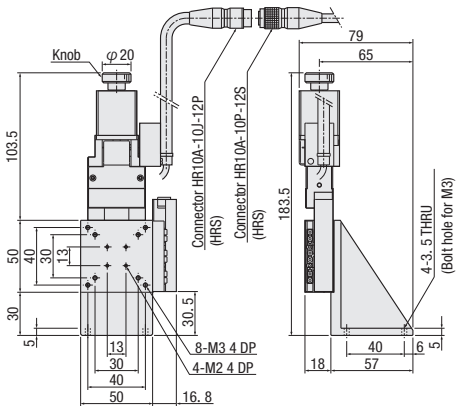
PZG413-R



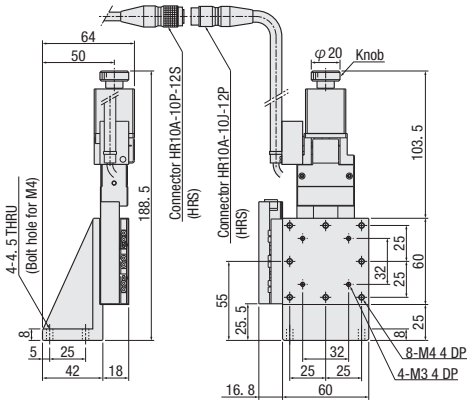
PZG513-L



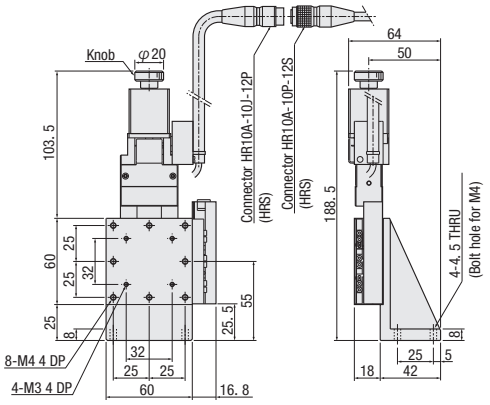
PZG513-R



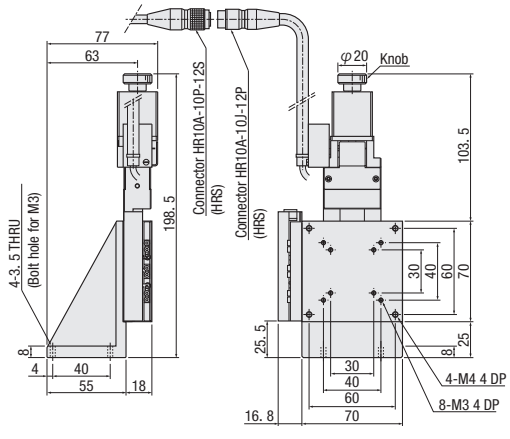
PZG615-L



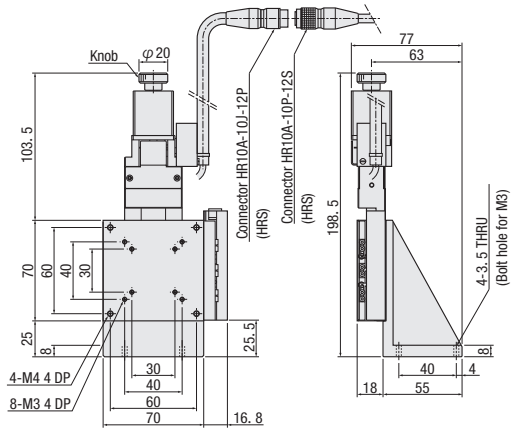
PZG615-R



PZG715-L



PZG715-R



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

PMZG615-L

PMZG615-R

RoHS

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

Model / Selection code / Option code

PMZG 413-L05AG-C 5

1 2 3 4 5 6 7

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

1 Table size

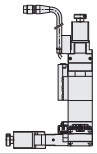
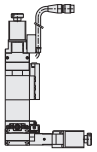
4	□40mm
5	□50mm
6	□60mm
7	□70mm

2 Travel length

13	13mm
15	15mm

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

3 Sensor cover location specification

L	X-axis L, Y-axis R, Z-axis L 
R	X-axis R, Y-axis L, Z-axis R 

4 Sensor voltage

05	5V
24	24V

* 05 [5V] for standard

5 Sensor logic

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

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

6 Motor option

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

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

7 Cable option

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

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

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

[Note]
Please check available cable from compatibility list.

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

SPEC

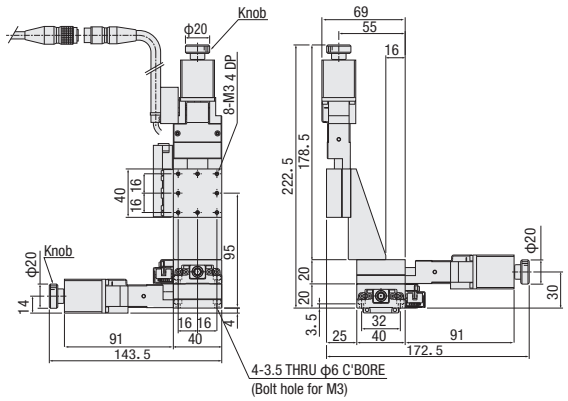
Model		PMZG413-L05AG-C5	PMZG513-L05AG-C5	PMZG615-L05AG-C5	PMZG715-L05AG-C5
(Opposite hand)		PMZG413-R05AG-C5	PMZG513-R05AG-C5	PMZG615-R05AG-C5	PMZG715-R05AG-C5
Mechanical specification	Travel length	13mm		15mm	
	Table size	40×40mm	50×50mm	60×60mm	70×70mm
	Feed screw (Ball screw)	φ6 lead 1			
	Guide	Linear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

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

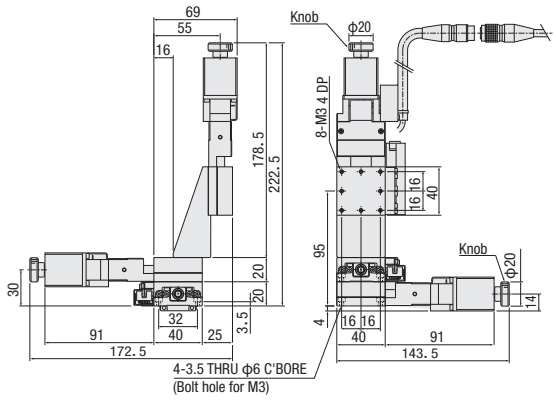
※ Might be changed specification due to motors. See page P.1-213~ for details.

Dimensional outline drawings

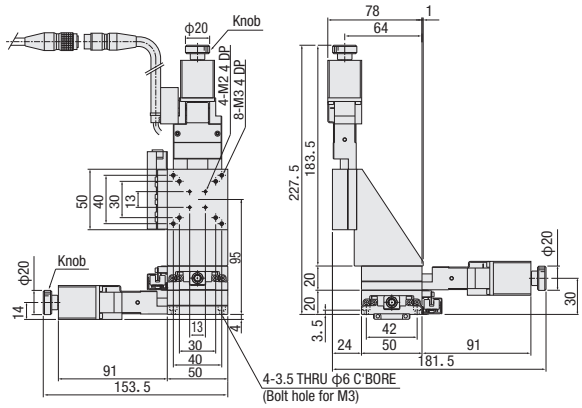
PMZG413-L



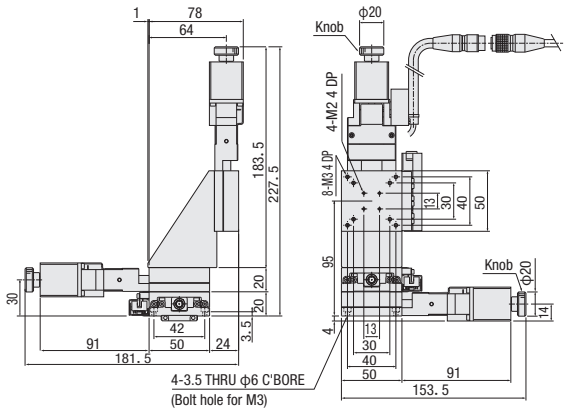
PMZG413-R



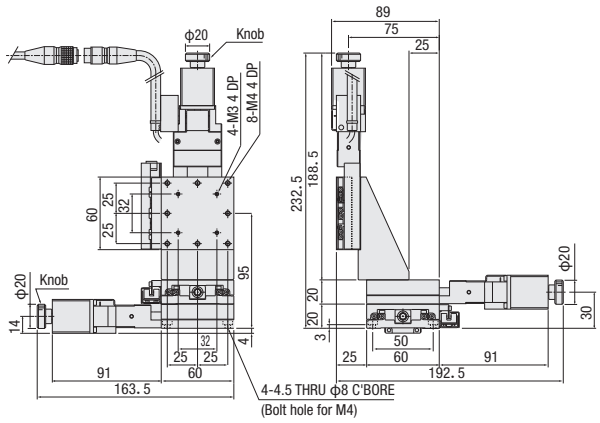
PMZG513-L



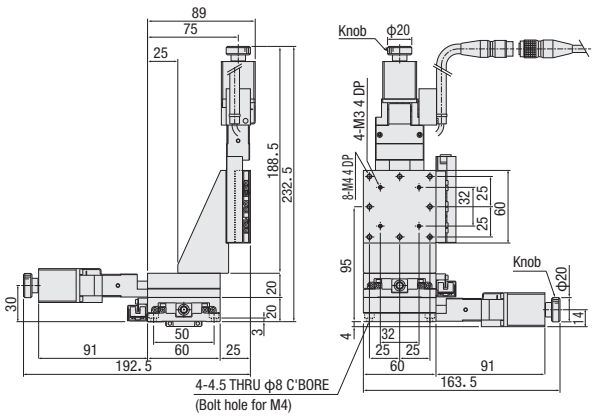
PMZG513-R



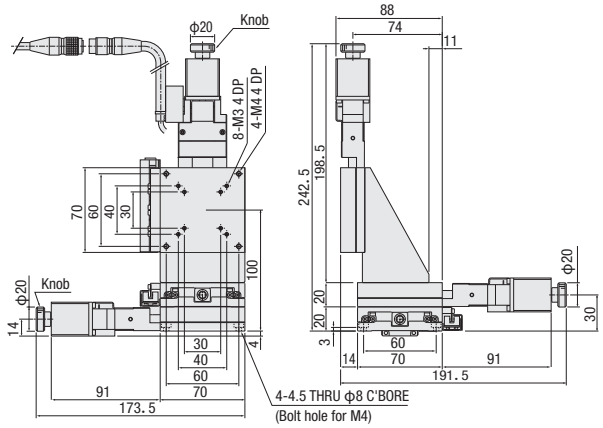
PMZG615-L



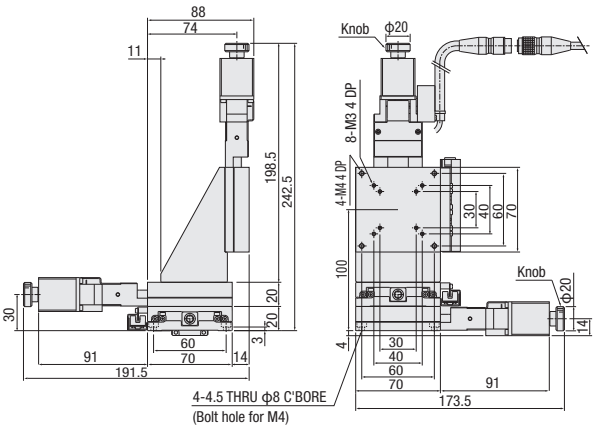
PMZG615-R



PMZG715-L



PMZG715-R



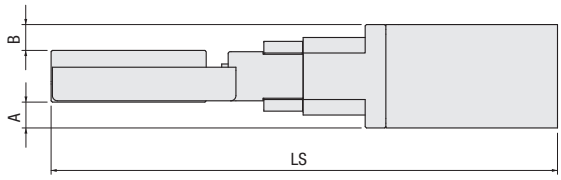
Electrical Specification: PG Series

Motor・Electrical specification

Motor code				C	D	E	MA	PA	UA	
Models				PG413-****-C PG513-****-C PG615-****-C PG715-****-C PG430-****-C PG530-****-C PG650-****-C PG750-****-C	PG413-****-D PG513-****-D PG615-****-D PG715-****-D PG430-****-D PG530-****-D PG650-****-D PG750-****-D	PG413-****-E PG513-****-E PG615-****-E PG715-****-E PG430-****-E PG530-****-E PG650-****-E PG750-****-E	PG413-****-MA PG513-****-MA PG615-****-MA PG715-****-MA PG430-****-MA PG530-****-MA PG650-****-MA PG750-****-MA	PG413-****-PA PG513-****-PA PG615-****-PA PG715-****-PA PG430-****-PA PG530-****-PA PG650-****-PA PG750-****-PA	PG413-***-UA PG513-***-UA PG615-***-UA PG715-***-UA PG430-***-UA PG530-***-UA PG650-***-UA PG750-***-UA	
MotorSpecification (*1)	Type			5 phase stepping motor 0.75A/Phase			5 phase 0.35A/Phase	α step motor	AC servo motor	
	Feature			Standard	High-torque	High resolution	With electromagnetic brake	Small step-out	High speed	
	Model (*2)			PK523HPB-C15	PK525HPB	PK523HPMB	PKE545MC-A1	ARM24SAK	HG-KR053	
	Electromagnetic brake			–			Installed	–		
	Maker			Oriental Motor Co., Ltd.					Mitsubishi Electric corporation	
	Step angle (Position detector)			0.72°		0.36°	0.72°	0.36° (Set to 1000P/R)	22 bits encoder (4194304P/R)	
	Mass			0.1kg	0.2kg	0.11kg	0.52kg	0.15kg	0.34kg	
	Motor size	□size		28mm			42mm	28mm	40mm	
		L size		42mm	61.5mm	42mm	69mm	45mm	66.4mm	
	Excitation (moment) maximum torque			0.033N・m	0.073N・m	0.038N・m	0.240N・m	0.055N・m	0.56N・m	
	Driver type			P.1-205～			RKSD503M-A	ARD-K	MR-J4-10A	
	Input power (Voltage・frequency)						Single phase AC100-120V 50/60Hz	DC24V±10%	Three and single phase AC200-240V 50/60Hz	
Sensor	Limit sensor			Installed						
	Origin sensor (ORG1)			Installed						
	Slit origin sensor (ORG2)			Installed				–		
	Model			Photo microsensor EE-SX384,EE-SX484 (Omron Co., Ltd.) (Slit origin sensor will be PM-L25(Panasonic Industrial Devices SUNX) in code M)						
	Power voltage			DC5V±5% (DC24V±10% Option) (PM-L25 power voltage: DC5～24V±10%)						
	Consumption current			Total 100mA or less (25mA per 1 sensor) (PM-L25 consumption current: 15mA or less)						
	Control output			EE-SX384/EE-SX484: NPN open collector output DC5～24V 16mA or less Residual voltage 0.4V or less when the load current is 16mA PM-L25: NPN open collector output DC30V or less50mA 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			EE-SX384: Output transistor is ON at the light sheild (continuity) EE-SX484: Output transistor is OFF at the light sheild (Non-continuity) PM-L25: Output transistor is OFF at the light sheild (Non-continuity)						
Connector	Motor	Model		HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)			motor side: 5557-06R-210 electromagnetic brake side: 5557-02R-210(MOLEX)	43020-1000 (Japan Molex)	Motor cable	–
									Encoder	–
		Receiving connector		HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)			motor side: 5559-06P-210 electromagnetic brake side: 5559-02P-210(MOLEX)	43020-1000 (Japan Molex)	Motor cable	JN4FT04SJ1-R (JAE)
									Encoder	1674320-1 (Tyco Electronics Japan G.K.)
	Sensor	Model	Limit sensor	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)			S5B-ZR-SM4-TF (LF) (SN) (JST Co., Ltd.)			
			Origin sensor (ORG1)							
			Slit origin sensor (ORG2)				PM-L25 Loose wire	–		
		Receiving connector	Limit sensor	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)			ZHR-5 (JST Co., Ltd.)			
			Origin sensor (ORG1)							
			Slit origin sensor (ORG2)				–			
Accuracy specification	Resolution	Lead 1mm	Full/Half	2μm/1μm		1μm/0.5μm	2μm/1μm	1μm/0.5μm	22 bits encoder (4194304P/R)	
			Micro step (1/20 split)	0.1μm		0.05μm	0.1μm	–		
	MAX speed Lead 1mm			10mm/sec	30mm/sec	25mm/sec	20mm/sec	35mm/sec	50mm/sec	

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

Dimensional outline drawings



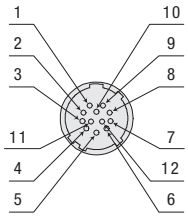
Motor code	Size □[mm]	A	B	LS							
				PG413	PG513	PG615	PG715	PG430	PG530	PG650	PG750
C	28	4	4	143.5	153.5	163.5	173.5	172	182	221	231
D	28	4	4	163	173	183	193	191.5	201.5	240.5	250.5
E	28	4	4	143.5	153.5	163.5	173.5	172	182	221	231
MA	42	11	11	180	190	200	210	208.5	218.5	257.5	267.5
PA	28	4	4	144	154	164	174	172.5	182.5	221.5	231.5
UA	40	10.7	10.5	175.9	185.9	195.9	205.9	204.4	214.4	253.4	263.4

Pin allocation・Connection diagram

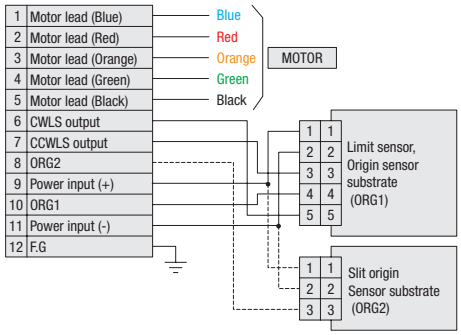
Motor code	Pin allocation・Connection diagram (Motor)	Pin allocation・Connection diagram (Sensor)

C・D・E

[Motor and sensor pin allocation (the same)]



[Motor and sensor connection diagram (the same)]



(Usage sensor for each logis)

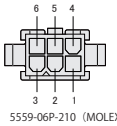
Sensor logic	CWLS,CCWLS	ORG1	ORG2
A	EE-SX484		EE-SX384
B	EE-SX384		EE-SX484
C	EE-SX484	EE-SX384	EE-SX484

* Please select the cable from the option code.
※See page ▶ P.1-211 for details of cable.

MA

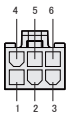
Cable for motor (3m)

・motor side

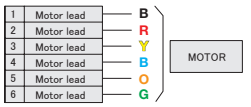


5559-06P-210 (MOLEX)

・driver side



5557-06R-210 (MOLEX)



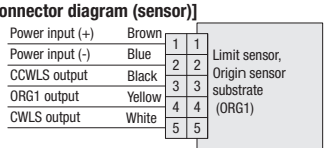
Electromagnetic brake cable (3m)

・motor side

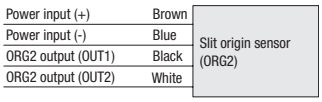
5559-02P-210 (MOLEX)

※Cable model:CC030VPFB See page ▶ P.1-211 for details.

[Connector diagram (sensor)]



※Attached sensor cable model:PG-H-ASSY5-2000
See page ▶ P.1-212 for details.

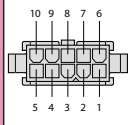


※See page ▶ P.1-212 for details of slit origin sensor PM-L25

PA

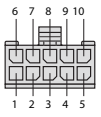
Cable for motor (3m)

・motor side

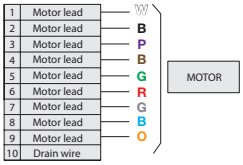


43020-1000 (MOLEX)

・driver side

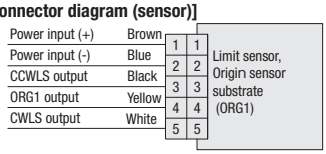


43025-1000 (MOLEX)



Motor cable model:CC030VA2R2 See page ▶ P.1-211 for details.

[Connector diagram (sensor)]



※Sensor cable model:PG-H-ASSY5-2000
See page ▶ P.1-212 for details.

UA

Motor cable model:SVPM-J3HF1-B-3-02S See page ▶ P.1-211 for details.

encoder model:SVEM-J3HF1-B-3 See page ▶ P.1-211 for details.

Cable type

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

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

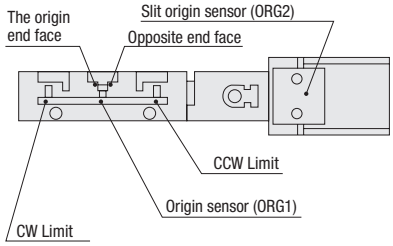
■Motor code [MA・PA・UA] compatible cable

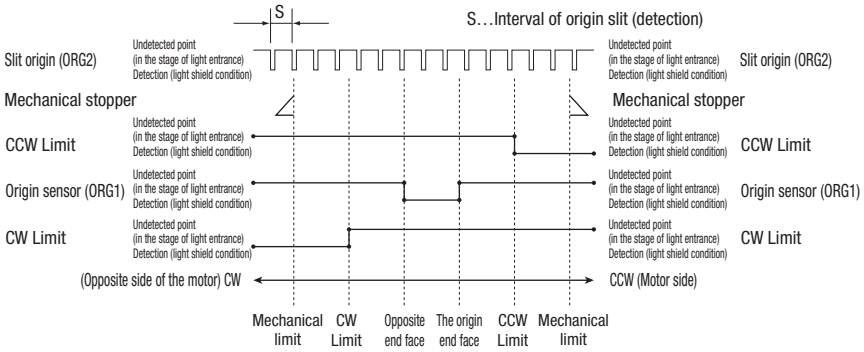
One set in motor driver and motor cable (encoder).

Motor code	Cable code	Driver type	Motor cable	Encoder cable	Sensor cable
MA	M	RKSD503M-A (Oriental Motor Co.,Ltd.)	CC030VPFB ▶ P.1-211「Motor code MA」	—	PG-H-ASSY5-2000 ▶ P.1-212 Refer the cable connection diagram
PA	P	ARD-K (Oriental Motor Co.,Ltd.)	CC030VA2R2 ▶ P.1-211「Motor code PA」	—	
UA	U	MR-J4-10A (Mitsubishi Electric corporation)	SVPM-J3HF1-B-3-02S ▶ P.1-211「Motor code UA」	SVEM-J3HF1-B-3 ▶ P.1-211「Motor code UA」	

Electrical Specification: PG Series

Timing chart



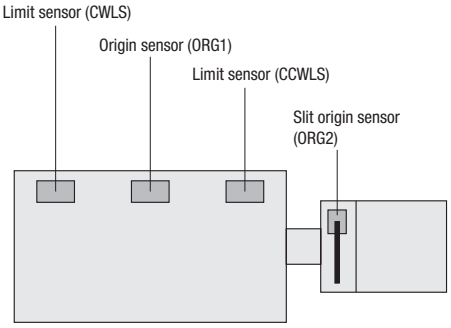


Unit [mm]		Direction of CW ◀				▶ Direction of CCW	
	Reference coordinate	Mechanical limit	CW Limit	Opposite end face	Origin	Mechanical limit	Mechanical limit
PG413·PG513	Return to origin	8.0	7.5	2	0	6.5	7.0
PG615·PG715	Return to origin	9.0	8.5	2	0	7.5	8.0
PG430·PG530	Return to origin	16.5	16.0	2	0	15.0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

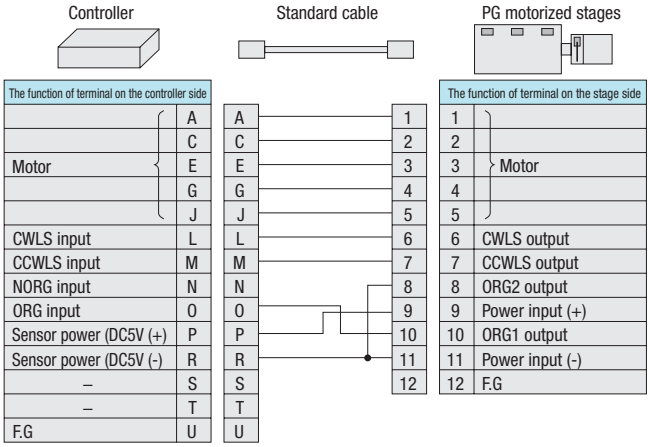
* Return to origin means use DS102/DS112 series controller for the return to origin type 3.
* The coordinate value should be on the design flaw. Dimension error may occur about plus or minus 0.5mm.

Built-in sensor

PG series have built-in sensors as below.



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



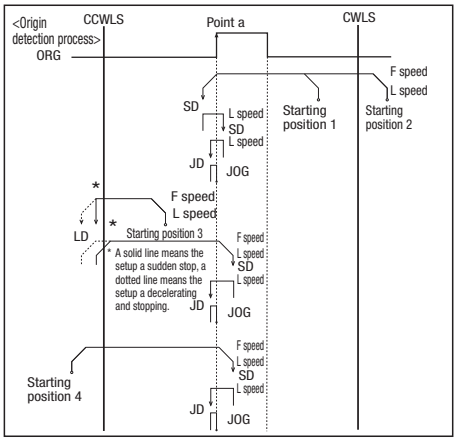
The CWLS(pin#6) and CCWLS(pin#7) on the motorized stage side are connected to CWLS(Lpin) and CCWLS(Mpin) of controller as usual. However ORG2 output (Pin#8) is connected to DC5V(-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sensor of ORG2 does not work on this wire connection,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

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

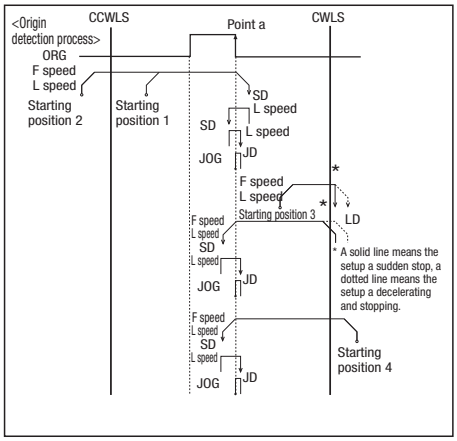
This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors. Also please note that the type is different from recommendation return to origin. Should be selected cable code 5 (without cable), and order the cable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

PG series recommendation return to origin method

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



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

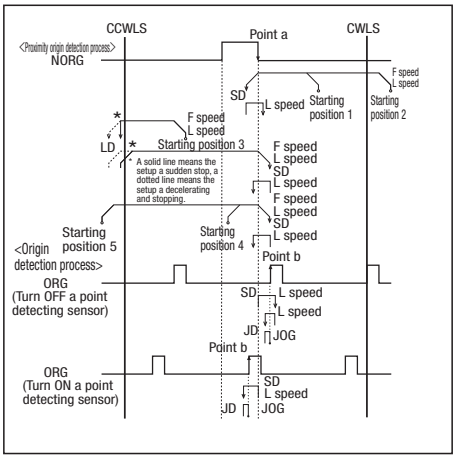


[Type9]
After finished Type3, perform detected process for CCW edge of TIMING signal.

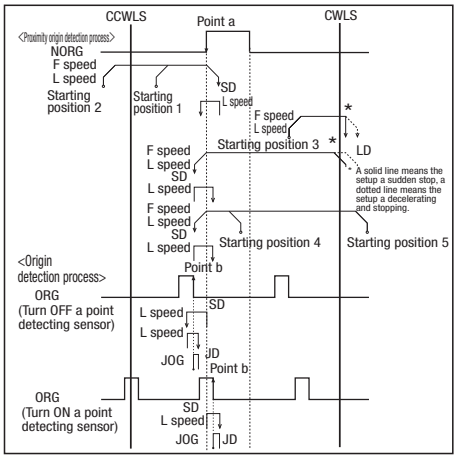
[Type10]
After finished Type4, perform detected process for CW edge of TIMING signal.

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

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



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



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

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

Return to origin sequence ▶ P.1-201～

Adaptive driver

■ **Driver** ▶ P.1-205～

DC24V type input

Model	CVD507-K-A9	CRD5107P
Divisions	1～1/250 (16 steps)	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	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO


DS112/102

KXT series

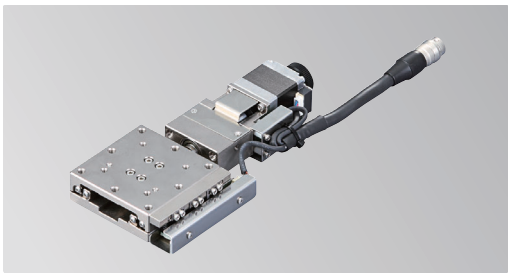
SURUGA SEIKI

High performance

■KXT series

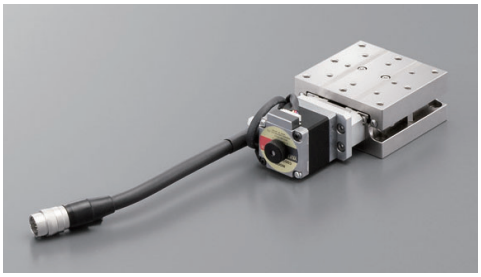
Specialized necessary functions. Outstanding cost performance.

■PG series



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

■CAVE-X POSITIONER KXG series



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

■CAVE-X POSITIONER KXL series

Selectable travel range between 30mm to 300mm.

For proper operation

▽Mounting

Fix at lease 4 corners with attached screws.

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

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

▽Positioning

■Positioning of stage mounting

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

X-axis Linear Ball Guide: KXT04015/KXT06015

KXT04015-LC

KXT06015-LC

RoHS

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

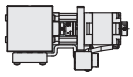
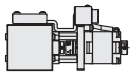
Model: KXT 04015-LC (Selection code: 1 2) (Option code: 3)

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

1 Table size

04	□40mm
06	□60mm

2 Sensor cover location

L	L position 
R	Opposite hand 

3 Cable option

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

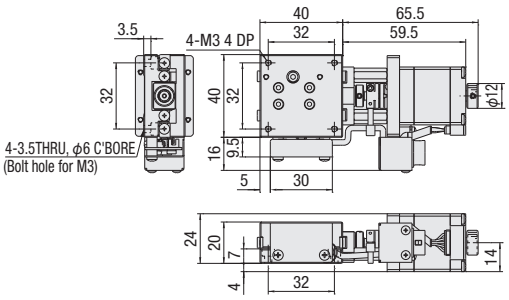
* The one end loose side might be on an opposite side of stage.
See page P.1-207,209～ for cable details.
Please select "Code F or H" when connect with stepping motor controller(DS102/112).

SPEC

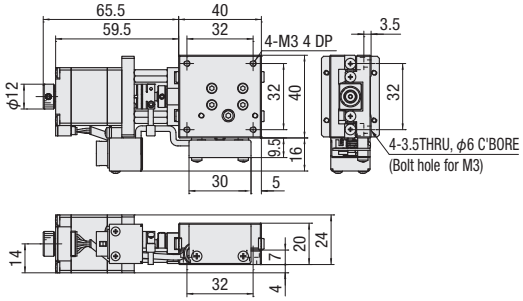
Model		KXT04015-LC	KXT06015-LC
(Right or left handed/opposite hand)		KXT04015-RC	KXT06015-RC
Mechanical specification	Travel length	15mm	
	Table size	40×40mm	60×60mm
	Feed screw (Ball screw)	ϕ6 lead 1	
	Guide	Linear ball guide	
	Main materials-Finishing	Steel—Opposite side of the end face finishing	
	Weight	0.38kg	0.60kg
Accuracy specification	Resolution (Pulse)	2μm (Full)/1μm (Half)	
	MAX speed	10mm/sec	
	Uni-directional positioning accuracy	8μm	
	Repeatability positioning accuracy	±0.5μm	
	Load capacity	10kgf [98N]	
	Moment stiffness	Pitch 0.38/yaw 0.35/roll 0.21 ["/N・cm]	Pitch 0.1/yaw 0.08/roll 0.05 ["/N・cm]
	Lost motion	2.5μm	
	Straightness	10μm	
	Parallelism	20μm	
	Pitching/Yawing	30"／25"	35"／30"
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
Provided screw (Hexagon-headed bolt)		4 of M3-8	4 of M4-8

Dimensional outline drawings

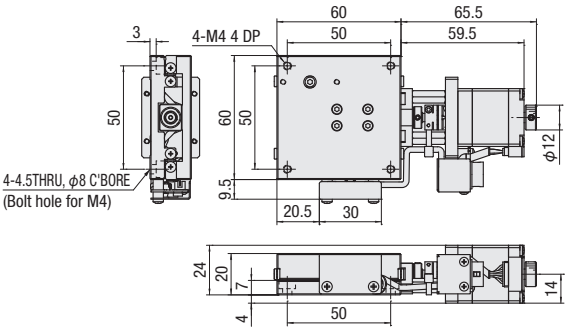
KXT04015-LC



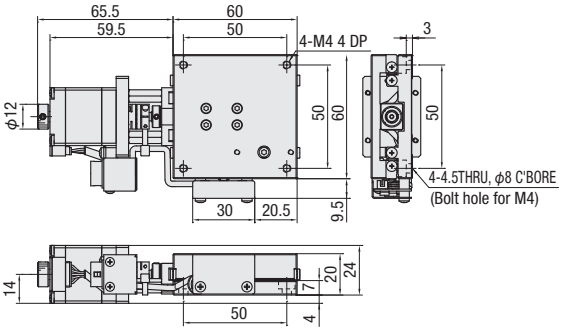
KXT04015-RC



KXT06015-LC



KXT06015-RC



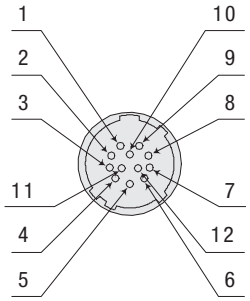
Electrical Specification: KXT04015/KXT06015

Electrical specification

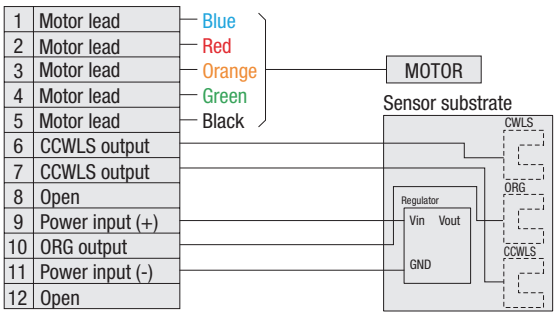
Models		KXT04015	KXT06015
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase	
	Maker	Oriental Motor Co., Ltd.	
	Model (*2)	C005C-90215P-1	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12PC (71) (Hirose Electric Co., Ltd.)	
	Receiving connector	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Model	Photo microsensor EE-SX4320 (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.

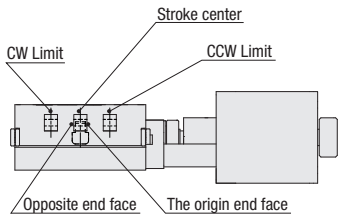
Pin allocation

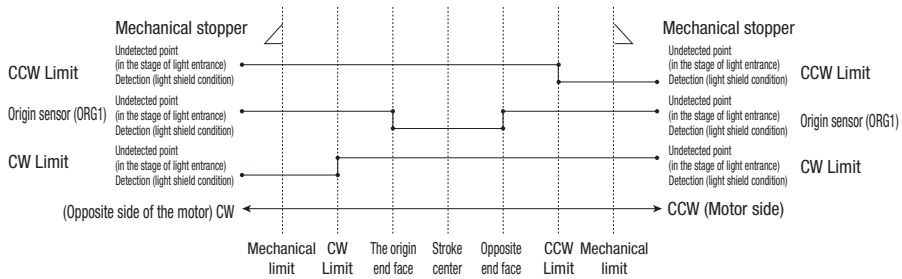


Connection diagram



Timing chart





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

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

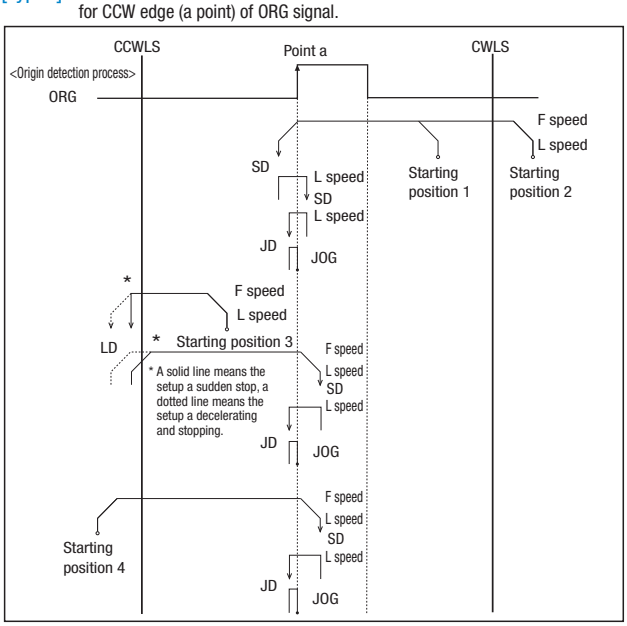
* Return to origin means that is performed return to origin type 4 using DS102/DS112 series.
* The coordinate value should be on the design. Dimension error may occur about plus or minus 0.5 mm.

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.

KXT series recommendation return to origin method

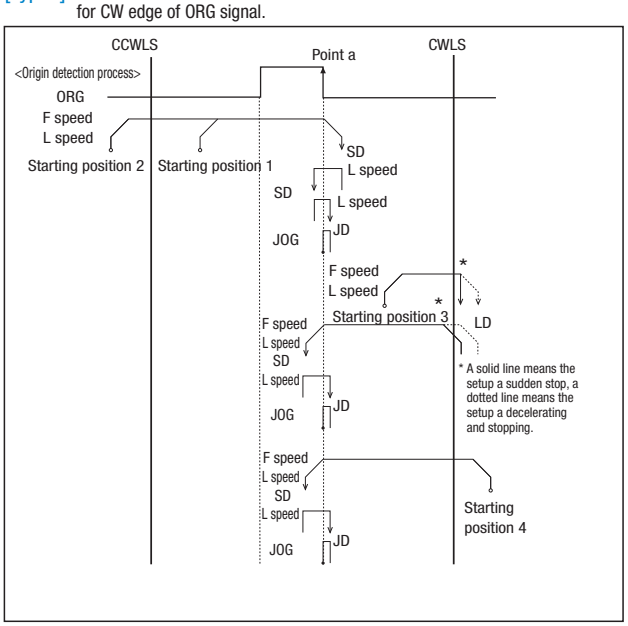
Suruga's motorized stages are different from the specification depending on the models. Therefore return to origin method other than recommendation may not be working correctly. Set to the way of recommendation return origin when using our controller.

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



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

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



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

Return to origin sequence P.1-201～

Adaptive driver

■ **Driver** P.1-205～

DC24V type input

Model	CVD507-K-A9	CRD5107P
Divisions	1～1/250 (16 steps)	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	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO

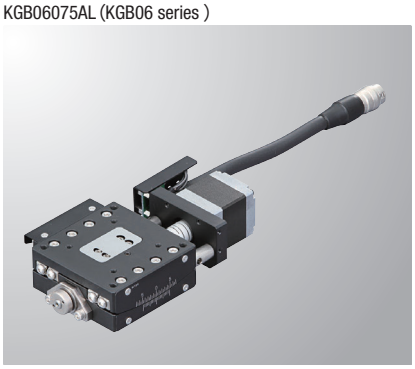

DS112/102

KGB series

SURUGA SEIKI

Ball Screw Type Sinemotion Goniometer Stages□60：KGB06/KAB06

■1-axis
KGB06075AL (KGB06 series)



■2-axis
KAB06075AL (KAB06 series)

Freely customize the motor

Original

RoHS

※Can be used for KGB
See page P.009

■High precision goniometer stages with ball bearings.This is ideal for driving a minute anglerepeatability.

■Configuration 2-axis
Combination of 1-axis stage that is different center of rotation.

Model: KGB06075- □ - □
(1) (2) (3) (4)

Cable P.1-207～
Electrical specification P.1-143～

1 Axis

G	1-axis
A	2-axis

2 Height of center rotation (W.D)

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

3 Sensor logic

Code	Specification
L	L position
R	Opposite hand

4 Cable option

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

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

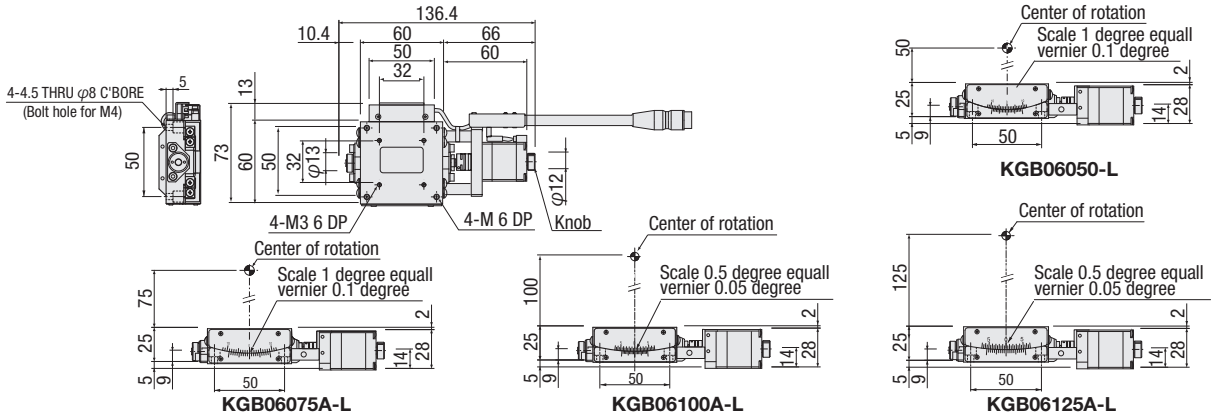
SPEC

Number of axes			1-axis				2-axis		
Model			KGB06050-L	KGB06075-L	KGB06100-L	KGB06125-L	KAB06050-L	KAB06075-L	KAB06100-L
(Opposite hand)			KGB06050-R	KGB06075-R	KGB06100-R	KGB06125-R	KAB06050-R	KAB06075-R	KAB06100-R
Mechanical specification	Travel length Upper/Lower axis		±8.5°	±5.5°	±5°	±4°	±8.5° /±5.5°	±5.5° /±5°	±5° /±4°
	Table size		60×60mm						
	Travel mechanism		Ball screw φ6 lead 1						
	Guide		Crossed roller guide						
	Main materials-Finishing		Aluminum—Black almite finishing						
	Weight		0.5kg				1.0kg		
Dimensional tolerance	Height of stage		25±0.2mm				50±0.4mm		
	Height of center rotation		50±0.2mm	75±0.2mm	100±0.2mm	125±0.2mm	50±0.4mm	75±0.4mm	100±0.4mm
	Runout accuracy of center rotation		Within 0.01mm				—		
Accuracy specification	Resolution (Pulse)*	Upper at the full	≒0.0021°	≒0.0014°	≒0.0011°	≒0.0009°	≒0.0021°	≒0.0014°	≒0.0011°
		Lower at the full					≒0.0014°	≒0.0011°	≒0.0009°
	MAX speed**	Upper	31.5°/sec [15kHz]	21°/sec [15kHz]	16.5°/sec [15kHz]	13.5°/sec [15kHz]	31.5° /sec	21° /sec	16.5° /sec
		Lower					21° /sec	16.5° /sec	13.5° /sec
	Repeatability positioning accuracy		±0.001°						
	Load capacity		5kgf【49N】				4.5Kg【44.1N】		
	Moment stiffness		Pitch 0.30/yaw 0.10/roll 0.11 ["/N・cm]				Pitch 0.41/yaw 0.2/roll 0.41 ["/N・cm]		
	Lost motion		Within 0.003°				Within 0.003°		
	Back Rush Within 0.003°		Within 0.003°				Within 0.003°		
Sensor	Limit sensor		Installed						
	Origin sensor		Installed						
	Slit origin sensor		—						
Provided screw (Hexagon-headed bolt)			4 of M4—10						

* See page 1-169 if you require exact calculations. ▶1-140 if you require exact calculations.
**The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

Dimensional outline awings (1-axis)

KGB06-L series



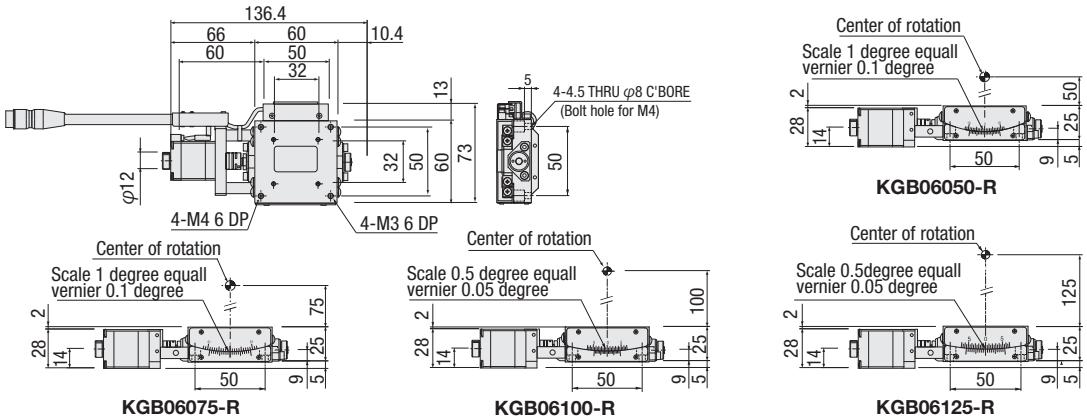
KGB06050-L

KGB06075A-L

KGB06100A-L

KGB06125A-L

KGB06-R series (Opposite hand)



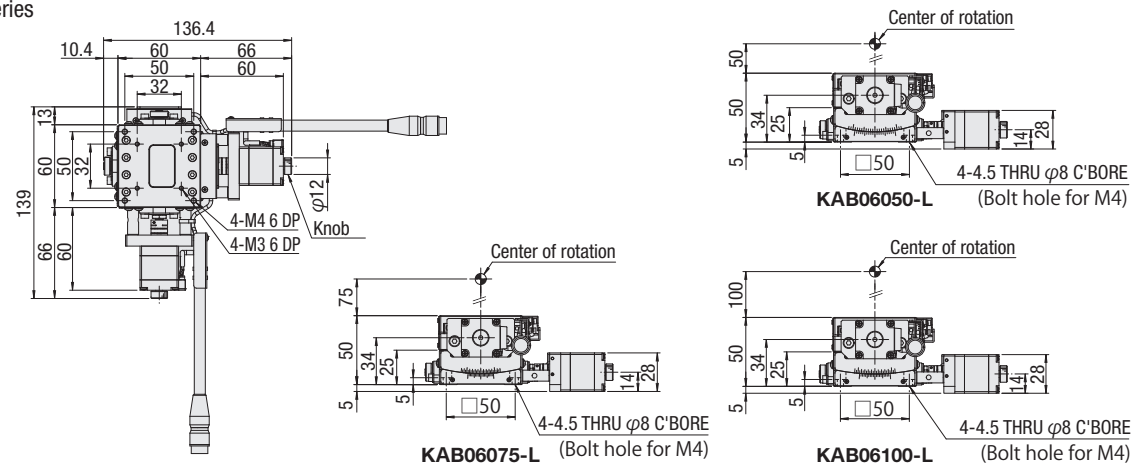
KGB06050-R

KGB06075-R

KGB06100-R

KGB06125-R

KAB06-L series

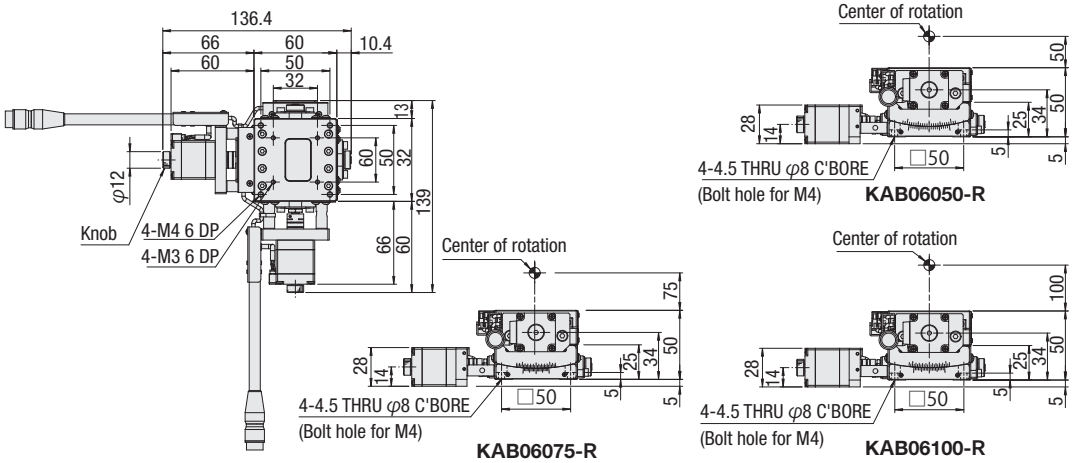


KAB06050-L

KAB06075-L

KAB06100-L

KAB06-R series (Opposite hand)



KAB06075-R

KAB06050-R

KAB06100-R

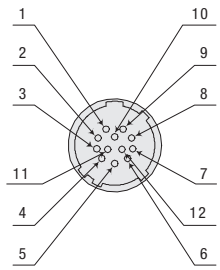
Electrical Specification•Option : KGB06/KAB06

Electrical specification

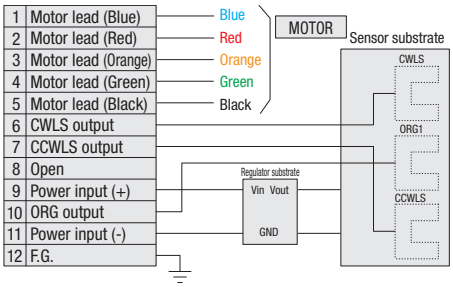
Model		KGB06050-L	KGB06075-L	KGB06100-L	KGB06125-L	KAB06050-L	KAB06075-L	KAB06100-L
Opposite hand		KGB06050-R	KGB06075-R	KGB06100-R	KGB06125-R	KAB06050-R	KAB06075-R	KAB06100-R
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)						
	Model (*2)	C005C-90215P-1						
	Step angle	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.

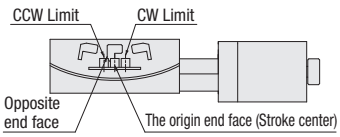
Pin allocation

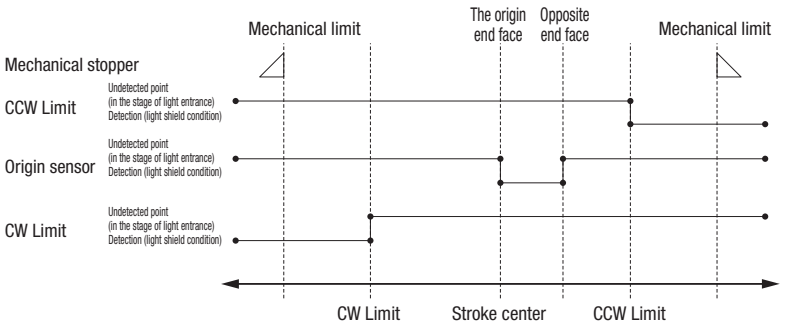


Connection diagram



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
KGB06050	Return to origin	8.7	0	2.5	10.5
KGB06075	Return to origin	5.7	0	1.8	8.3
KGB06100	Return to origin	5.2	0	1.4	6.3
KGB06125	Return to origin	4.2	0	1.1	5.2

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

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.

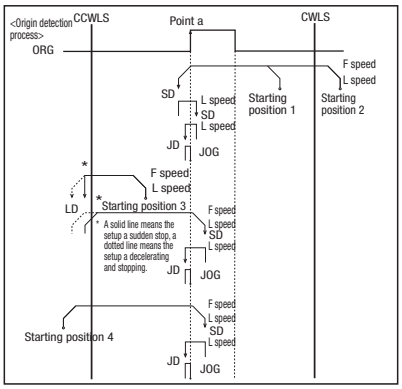
Method for return to origin

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.

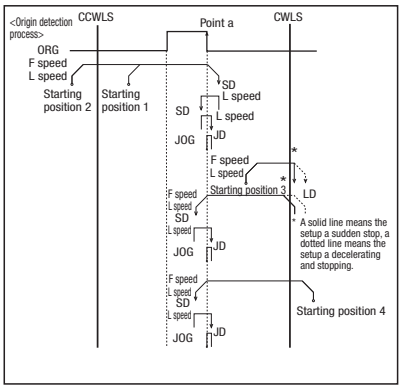
■KGB06/KAB06 recommended return to origin　　Return to origin sequence P.1-201～

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

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



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



Adaptive driver

■ **Driver** P.1-205～

DC24V type input

Model	CVD507-K-A9	CRD5107P
Divisions	1～1/250 (16 steps)	1～1/250 (16 steps)

Adaptive stepping motor controller

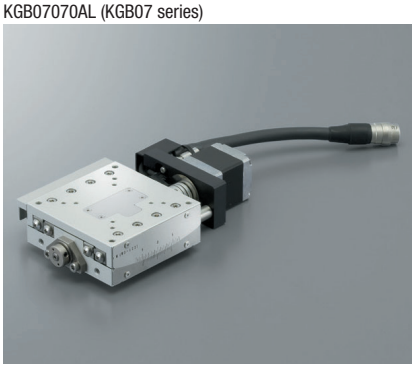
■ **Controller** P.1-197～

Input power	General-purpose input/ output port	Driver type	
		Full/Half	1～1/250[16 steps]
AC100-240V	Without	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO

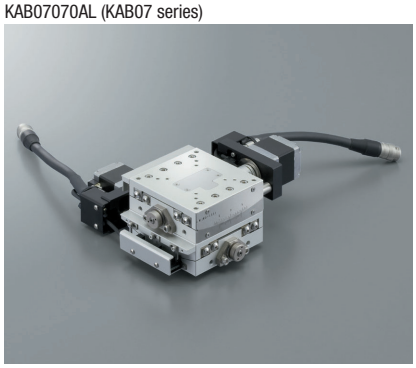

DS112/102

Ball Screw Type Sinemotion Goniometer Stage □70: KGB07/KAB07

■1-axis
KGB07070AL (KGB07 series)



■2-axis
KAB07070AL (KAB07 series)



Original RoHS

High precision goniometer stages with ball bearings.
This is ideal for driving a minute angle repeatability

■Configuration 2-axis
Combination of 1-axis stage that is different center of each rotation.

Model | Selection code | Option code

K GB07070 □□-□

1 2 3 4 5

Cable P.1-207～
Electrical specification P.1-147～

1 Axis

G	1-axis
A	2-axis

2 Height of center rotation (W.D)

070	70mm
096	96mm
122	122mm

* KAB07 is available only for W.D70, 90mm.

3 Sensor logic

Type	CWLS	ORG1	CCWLS	ORG2
A	NC	NC	NC	NO
B	NO	NO	NO	
C	NC	NO	NC	

4 Sensor cover location specification

Code	Specification
L	L position
R	Opposite hand

5 Cable option

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

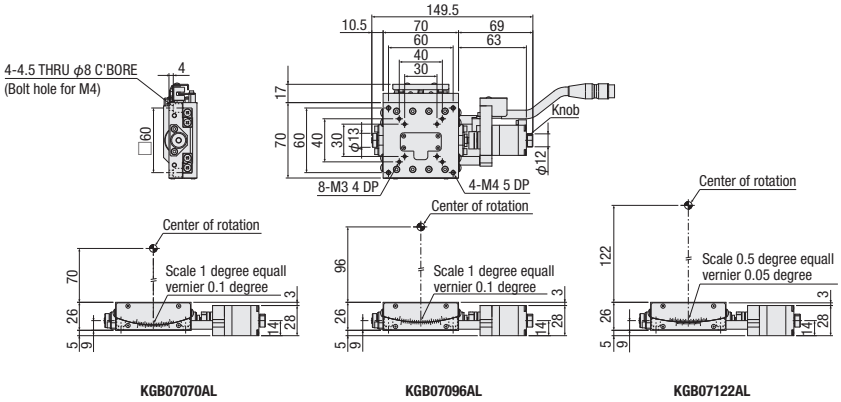
* One end loose position to only stage opposite side.
* If you choose the option specification, please add the difference to standard price.
* See page ▶ P.1-207, 209～ for details of cable.
* Please select "Code A, C, F or H" when connect with stepping motor controller(DS102/112).

SPEC							
Number of axis			1-axis			2-axis	
Model			KGB07070AL	KGB07096AL	KGB07122AL	KAB07070AL	KAB07096AL
(Opposite hand)			KGB07070AR	KGB07096AR	KGB07122AR	KAB07070AR	KAB07096AR
Mechanical specification	Travel length Upper/Lower axis		±5°	±4°	±3°	±5°/±4°	±4°/±3°
	Table size		70×70mm				
	Travel mechanism		Ball screw φ6 lead 1				
	Guide		Crossed roller guide				
	Main materials-Finishing		Aluminum–White almite finish				
	Weight		0.7kg			1.4kg	
Dimensional diagram	Height of stage		26±0.2mm			52±0.4mm	
	Height of center rotation		70±0.2mm	96±0.2mm	122±0.2mm	70±0.4mm	96±0.4mm
	Runout accuracy of center rotation		Within 0.01mm			—	
Accuracy specification	Resolution (Pulse)	Upper at the full	≒0.0015°	≒0.0011°	≒0.0009°	≒0.0015°	≒0.0011°
		Lower at the full				≒0.0011°	≒0.0009°
	MAX speed	Upper	23°/sec [15kHz]	17°/sec [15kHz]	13°/sec [15kHz]	23°/sec [15kHz]	17°/sec [15kHz]
		Lower				17°/sec [15kHz]	13°/sec [15kHz]
	Repeatability positioning accuracy		Within ±0.003°				
	Load capacity		5kgf [49N]			4kgf [39.2N]	
	Moment stiffness		Pitch 0.28/yaw 0.06/roll 0.06 ["/N・cm]			Pitch 0.34/yaw 0.12/roll 0.34 ["/N・cm]	
	Lost motion		Within 0.003°				
Sensor	Limit sensor		Installed				
	Origin sensor		Installed				
	Slit origin sensor		Installed				
Provided screw (Hexagon-headed bolt)			4 of M4—8				

*See page ▶ P.1-140 if you require exact calculations.
*The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

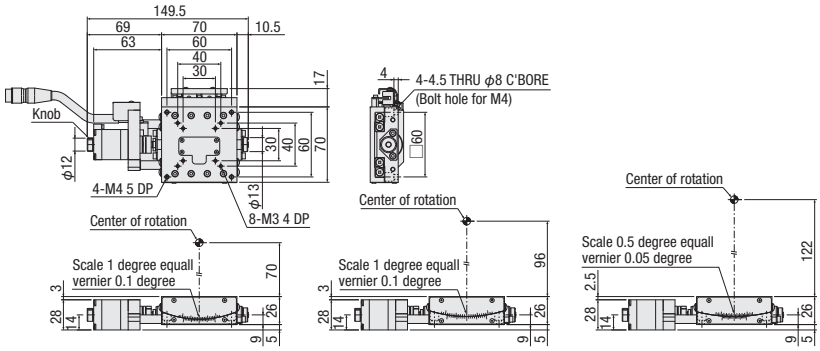
Dimensional outline drawings

KGB07-L series



KGB07070AL KGB07096AL KGB07122AL

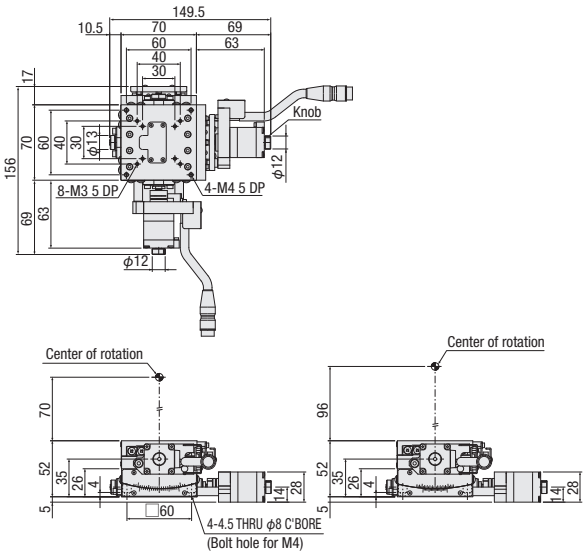
KGB07-R series



KGB07070AR KGB07096AR KGB07122AR

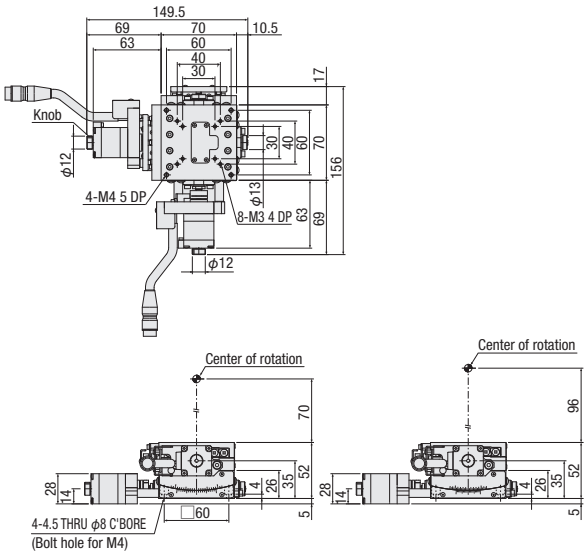
Dimensional outline drawings

KAB07-L series



KAB07070AL KAB07096AL

KAB07-R series



KAB07070AR KAB07096AR

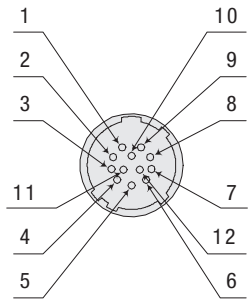
Electrical Specification•Option: KGB07/KAB07

Electrical specification

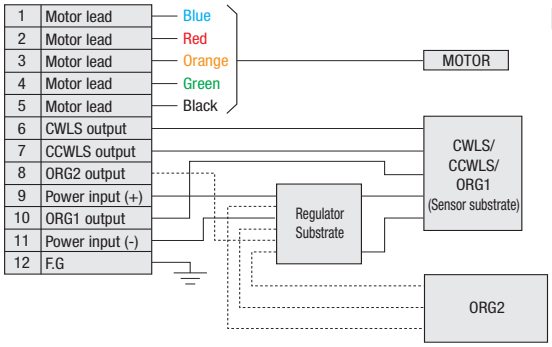
Model		KGB07070AL	KGB07096AL	KGB07122AL
Opposite hand		KGB07070AR	KGB07096AR	KGB07122AR
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)		
	Model (*2)	C005C-90215P-1		
	Step angle	0.72°		
Connector	Model	HR10A-10J-12P (73) (Hirose Electric Co., Ltd.)		
	Applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)		
Sensor	Limit sensor	Installed		
	Origin sensor (ORG1)	Installed		
	Slit origin sensor (ORG2)	Installed		
	Model	Photo microsensor: EE-SX398 (Omron Co., Ltd.) 、 EE-SX498 (Omron Co., Ltd.) : Limit • Origin sensor Micro Photoelectric Sensor: PM-F25 (Opposite hand PM-R25) (Panasonic Industrial Devices SUNX) : Slit origin sensor		
	Power voltage	DC5～24V ±10%		
	Consumption current	Total 100mA or less		
	Control output	EE-SX398、EE-SX498: NPN open collector output DC5~24V 16mA or less Residual voltage 0.4V or less when the load current is 16mA		
		PM-F25 (Opposite hand PM-R25) : 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	EE-SX398: On detection (light shield condition): Output transistor ON (Continuity) EE-SX498: On detection (light shield condition): Output transistor OFF (Non-continuity) PM-F25 (R25) : On detection (light shield condition) : Output transistor ON (Continuity)		

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

Pin allocation



Connection diagram



*Broken line area does not work when use standard cable

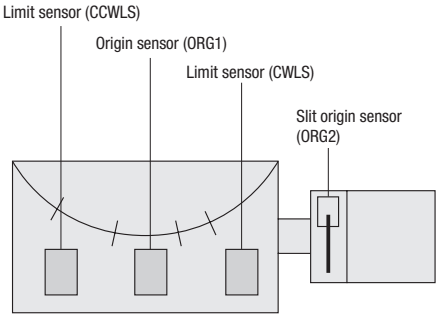
□70 goniometer sensor logic

Type	CWLS	ORG1	CCWLS	ORG2
A	NC EE-SX498	NC EE-SX498	NC EE-SX498	NO PM-F25 (Opposite hand PM-R25)
B	NO EE-SX398	NO EE-SX398	NO EE-SX398	
C	NC EE-SX498	NO EE-SX398	NC EE-SX498	

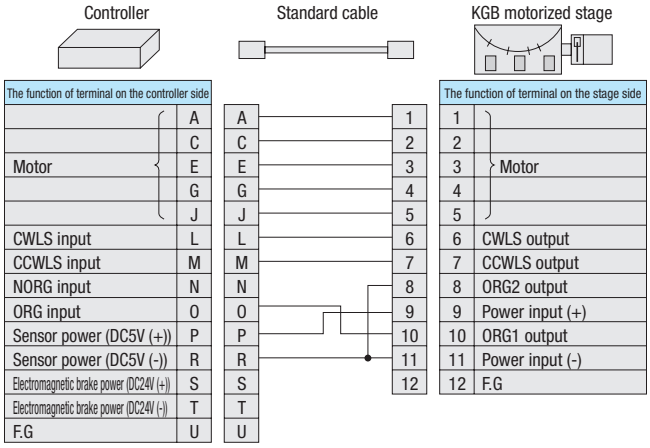
*Upper: Sensor logic
Lower: Using sensor

Built-in sensor

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



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

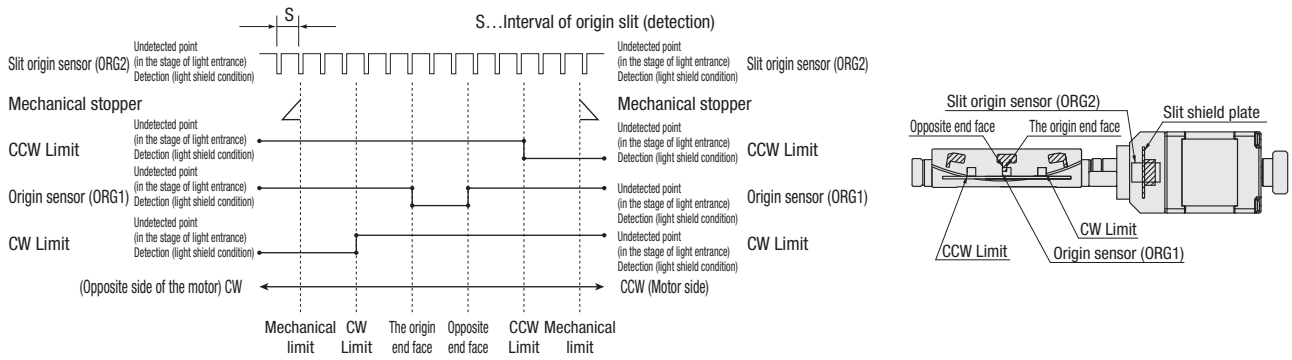


The CWLS (pin#6) and CCWLS (pin#7) o n the motorized stage side are connected to CWL S (Lpin) and CCWLS (Mpin) of controlle r as usual. However ORG2 output (Pin#8) is connected to DC5V (-) and ORG1 output (pin#10) will be connected to ORG. In other words, the sen sor of ORG2 does not work on this wire connection, only ORG1 sensor is recognized by the controller as origin signal. As a r esult, return to or igin should be done withou t the slit origin sensor as same as function of motorized stages that have only three sensors (CWLS, CCWLS and ORG).

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

This series are included four sensors as standard. In case of using four sensors with slit origin sensor (ORG2), you need the cable for four sensors.
Also please note that the type is different from recommendation return to origin.
When use all of 4 sensors, please select the cable for 4 sensors from page ▶ P.1-207~.

Timing chart



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

	Detection clearance of slit origin S	Reference coordinate	CW Limit	Origin	Opposite end face	CCW Limit
KGB07070A	0.8	Return to origin	5.3	0	2.1	5.3
KGB07096A	0.6	Return to origin	4.2	0	1.5	4.2
KGB07122A	0.5	Return to origin	3.2	0	1.3	3.2

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

Method for return to origin

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

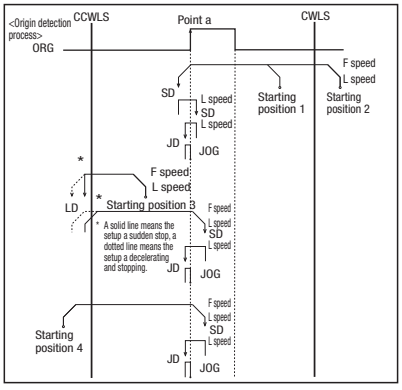
■KGB07/KAB07 recommended return to origin Return to origin sequence ▶ P.1-201～

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

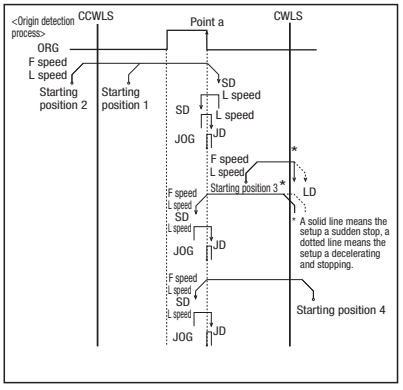
●Select return to origin type from the followings when use the slit origin sensor (ORG2).

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

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



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



Adaptive driver

■ **Driver** ▶ P.1-205～

DC24V type input

Model	CVD507-K-A9	CRD5107P
Divisions	1～1/250 (16 steps)	1～1/250 (16 steps)

Adaptive stepping motor controller

■ Controller ▶ P.1-197～

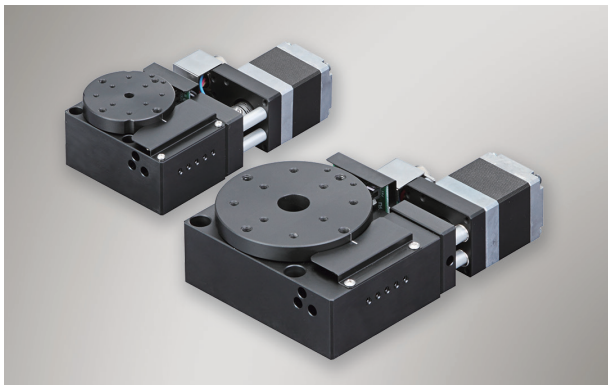
Input power	General-purpose input/output port	Driver type	
		Full/Half	1～1/250 (16 steps)
AC100-240V	Without	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO


DS112/102

KRB series

SURUGA SEIKI

Sinemotion Rotary Stage Guidance



Rotation stage with ball bearing.
It is ideal for fine angle stepping repeatability.

Usage

- For posture controlled
- For lens or LD panel bonding

Sine motion rotary stage guidance

High durability type

Backlash by the abrasion was concerned about by the worm gear type when continued being driven at a microangle repeatedly.
We have succeeded in making travel mechanism a ball screw from a worm gear.

Improvement acceleration/deceleration

Can be smooth starting and acceleration because of low friction.

Reduce the backlash

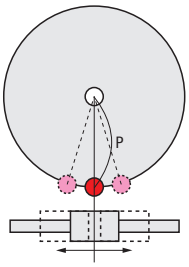
Reduce the backlash with preload mechanism.

Travel distance and constant speed

The linear movement of a ball screw is converted into rotational movement by bearings in the stage.
(The travel distance of ball screw is not the same as the travel angle of the stage because linear movement is converted into rotational ovement).
As a result, the resolution per pulse is different between the stroke center and the end.
The rotation speed is not stable even when sending pulse signals at a constant speed.

Equipment for calculating the travel distance

*An equation on the basis of the stroke center.
(1) Travel angle=Arcsin((Input pulse*X)/P)
(2) Input pulse=P*sin(travel distance)/X



P=Distance between supporting points
(The distance between center rotation and bearing)

Definition

Definition	Value	Unit
Distance between supporting points P	17	mm
Ball screw lead	1	mm
Motor basic step angle	0.72	Degree
Ball screw travel length per pulse X	0.002	mm

* Distance between supporting points are different from the stage.

Basic specification

Model	Motor basic step angle	Distance between supporting points P
KRB04017C	0.72°	17mm
KRB06011C	0.72°	27mm

Contact us for details of the equation.

For proper operation

▽Mounting

KRB04017: Fix 3 position with supplied screw.
KRB06011: Fix with supplied screws to 3 position of lower plate.

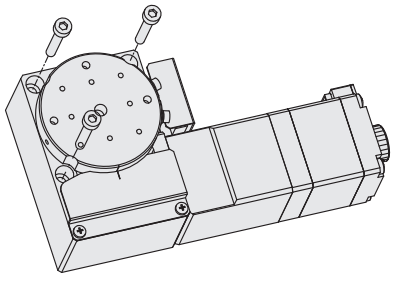
▽About the object that mounted on upper/bottom of stage.

When a stage is mounted on uneven or an object that is uneven,
the stage table may deformed, and may also affeted the accuracy.
[Approximate flatness: up to 10μm]

▽Position of stage mounting

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

- KRB04017:Fit the hole of the upper table with the installation hole



Sinemotion Rotary Stage ϕ40/ϕ60: KRB04/KRB06

Rotation stage with ball bearing.
It is ideal for fine angle stepping repeatability.

Freely customize the motor - Original - RoHS - CAD 2D·3D

See page P.009

Model: KRB04017C-□
(1) (2) (3)

1 Table size

04	ϕ40mm
06	ϕ60mm

2 Travel length

017	±8.5°
011	±5.5°

* Cannot choose 04011 and 06017.

3 Cable option

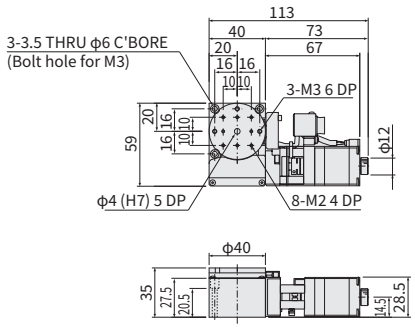
Code	Specification	Cable type
A	2m	D214-2-2E
B	2m One end loose	D214-2-2EK
C	4m	D214-2-4E
D	4m One end loose	D214-2-4EK
E	Only connector (Cable is not included)	—
F	Robot cable 2m	D214-2-2R
G	Robot cable 2m one end loose	D214-2-2RK
H	Robot cable 4m	D214-2-4R
J	Robot cable 4m one end loose	D214-2-4RK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

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

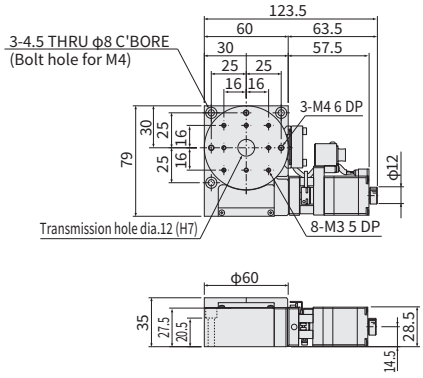
Cable P.1-207～
Electrical specification P.1-171～

Dimensional outline drawings

■KRB04017C



■KRB06011C



SPEC			
Model		KRB04017C	KRB06011C
Mechanical specification	Travel length	±8.5°	±5.5°
	Table size	ϕ40mm	ϕ60mm
	Travel mechanism	Ball screw ϕ6 lead 1	
	Guide	Combination angular ball bearing	
	Main materials-Finishing	Aluminum–Black almite finishing	
	Weight	0.5kg	0.7kg
Accuracy specification	Resolution/Pulse	≒0.0067°(Full)	≒0.0042°(Full)
	MAX speed※	102°/sec [15kHz]	64°/sec [15kHz]
	Repeatability positioning accuracy	Within ±0.003°	
	Load capacity	4.0kgf [39.2N]	6.0kgf [58.8N]
	Moment stiffness	0.52″/N・cm	0.25″/N・cm
	Lost motion	0.003°	
	Backlash	0.01°	
	Parallelism	Within 50μm	
Sensor	Limit sensor	Installed	
	Origin sensor	Installed	
	Slit origin sensor	—	
Provided screw (Hexagon-headed bolt)		3 of M3—25	3 of M4—25

*See page P.1-169 if you require exact calculations.
* The MAX speed becomes the theory speed at the time of the 15kHz drive for the traveling pulse of the full stroke.

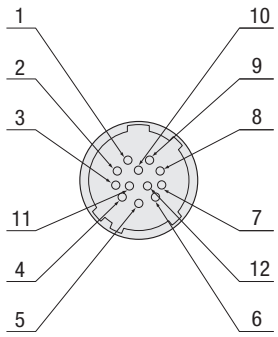
Electrical Specification: KRB04/KRB06

Electrical specification

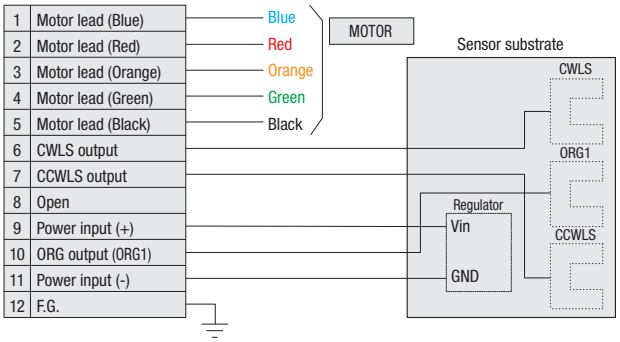
Models		KRB04017C	KRB06011C
Motor (*1)	Type	5 phase stepping motor 0.75A/Phase (Oriental Motor Co., Ltd.)	
	Model (*2)	C005C-90215P-1	
	Step angle	0.72°	
Connector	Model	HR10A-10R-12P (73) (Hirose Electric Co., Ltd.)	
	applicable connector on acceptance side	HR10A-10P-12S (73) (Hirose Electric Co., Ltd.)	
Sensor	Limit sensor	Installed	
	Origin sensor	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.

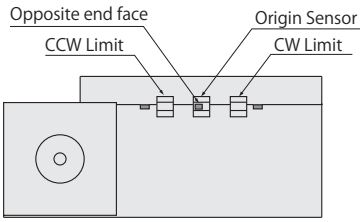
Pin allocation

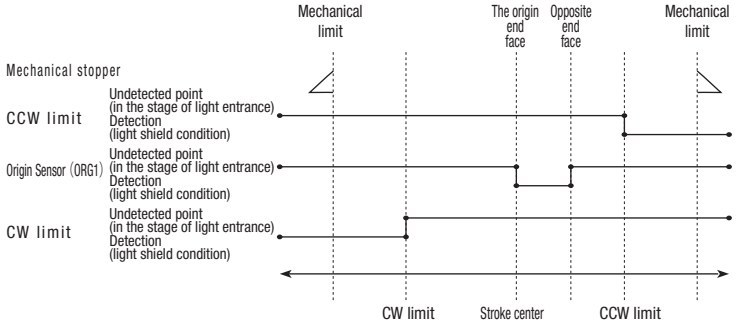


Connection diagram



Timing chart





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

	Reference coordinate	CW Limit	Stroke center	Opposite end face	CCW Limit
KRB04017C	Stroke center	9.0	0	4.5	9.0
KRB06011C	Stroke center	6.0	0	2.5	6.0

* The coordinate is a basis of design value.
* Please note ±0.5 [deg.] difference.

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

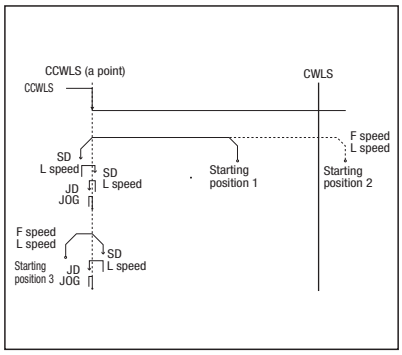
Method for return to origin

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

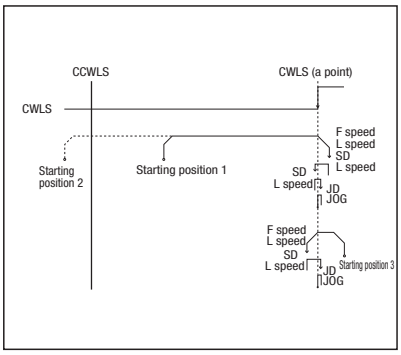
■KRB04017/KRB06011 recommended return to origin　Return to origin sequence ▶P.1-201～

Type 5: Detect in the direction of CCW and perform detected process for CW edge of CWLS signal.
Type 6: Detect in the direction of CW and perform detected process for CCW edge of CWLS signal.
Type 11: After finished type5, perform detected process for CCW edge of TIMING signal.
Type 12: After finished type6, perform detected process for CW edge of TIMING signal.

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



[Type6]
Detect in the direction of CW and perform detected process for CCW edge of CWLS signal.



Adaptive driver

■ **Driver** ▶P.1-205～

DC24V type input

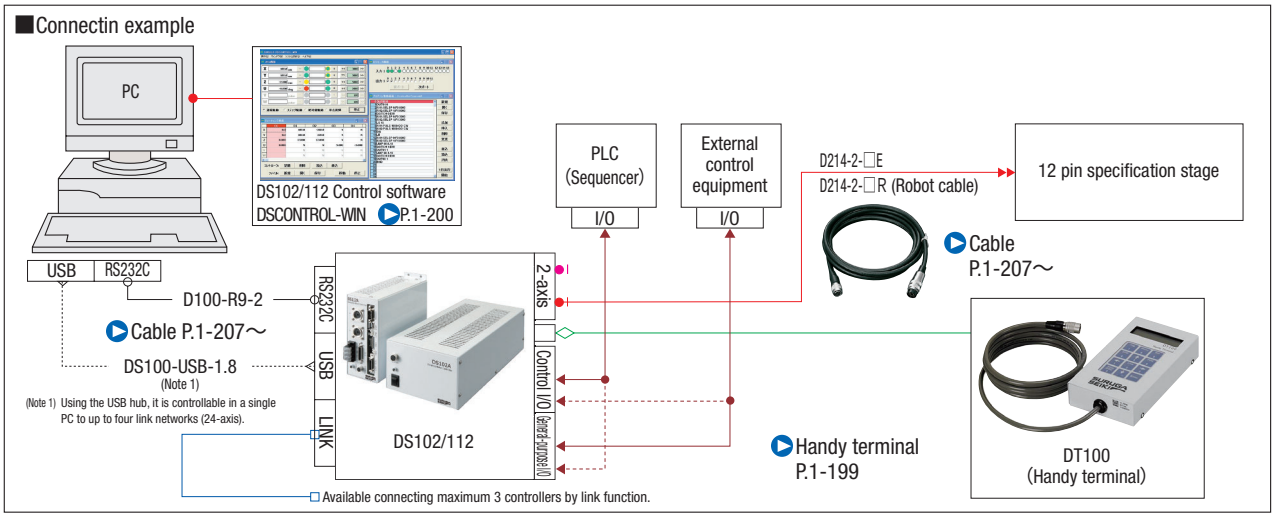
Model	CVD507-K-A9	CRD5107P
Divisions	1～1/250 (16 steps)	1～1/250 (16 steps)

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	DS102ANR	DS102AMS
	With	DS102ANR-IO	DS102AMS-IO
DC24V	Without	DS112ANR	DS112AMS
	With	DS112ANR-IO	DS112AMS-IO

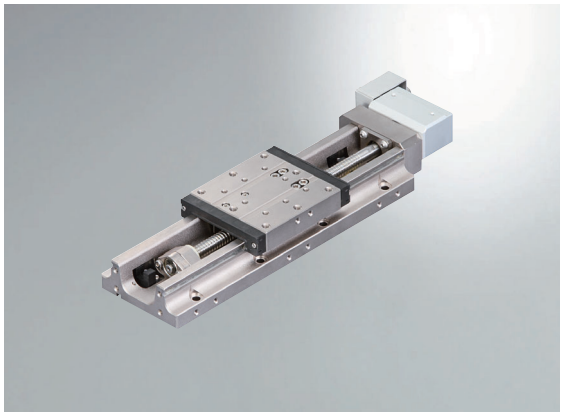
■Connectin example



Motorless

SURUGA SEIKI

X-axis Linear Ball Guide：KXL06V-N



accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Motor Plate			○	-	-
■Coupling (with screws)			○		
■Screws	For Motor		4 of M2.5-6	4 of M3-12	2 of M4-12
	For Motor Plate		2 of M4-8	-	-
	For Main Body	30～100mm	8 of M4-14		
		150mm	14 of M4-14		
		200mm	12 of M4-14		
		300mm	16 of M4-14		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model / Selection code / Option code

KXL06 030V-N1 - P28

1 2 1

1 Travel length

030	30mm
050	50mm
075	75mm
100	100mm
150	150mm
200	200mm
300	300mm

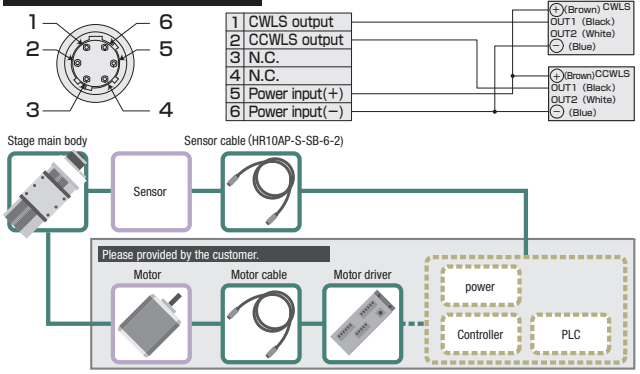
2 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

1 Application Motor

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

Pin allocation (Sensor)



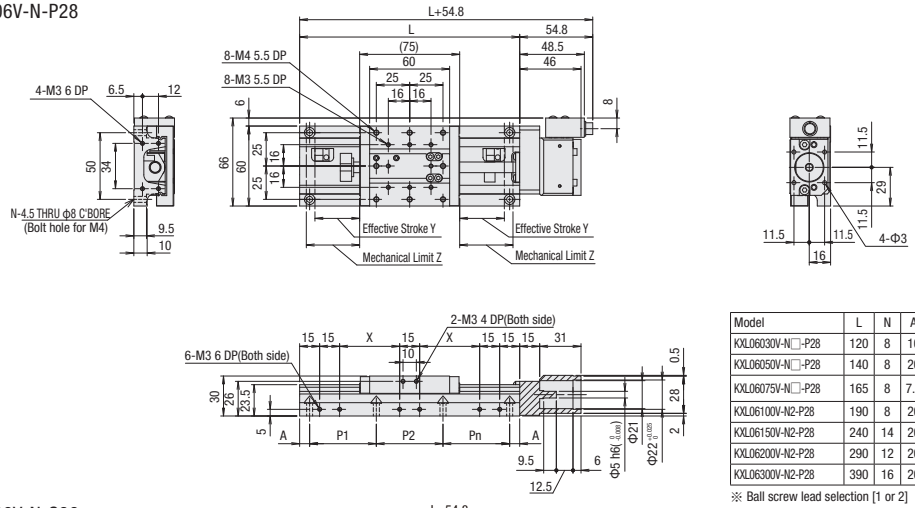
S P E C											
Model		KXL06030V-N1-P28	KXL06030V-N2-P28	KXL06050V-N1-P28	KXL06050V-N2-P28	KXL06075V-N1-P28	KXL06075V-N2-P28	KXL06100V-N2-P28	KXL06150V-N2-P28	KXL06200V-N2-P28	KXL06300V-N2-P28
Mechanical specification	Travel length	30mm		50mm		75mm		100mm	150mm	200mm	300mm
	Table size	60×60mm									
	Feed screw (Ball screw)	φ8 lead 1	φ8lead2	φ8 lead 1	φ8lead2	φ8 lead 1	φ8 lead 2	φ8 lead 2	φ8 lead 2	φ8 lead 2	φ8 lead 2
	Guide	Linear ball guide									
	Main materials-Finishing	Stainless-Electroless nickel plating									
Accuracy specification	Resolution (Pulse) Full/Half	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	4μm/2μm	4μm/2μm	4μm/2μm	4μm/2μm
	Resolution (Pulse) Microstep	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)
	MAX speed	30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec	45mm/sec			
	Uni-directional positioning accuracy	5μm				7μm		10μm	15μm	15μm	25μm
	Repeatability positioning accuracy	±0.5μm									
	Load capacity	12kgf【117.6N】									
	Moment stiffness	Pitch 0.05/yaw 0.05/roll 0.05 [″/N・cm]									
	Lost motion	1μm									
	Backlash	1μm									
	Straightness	3μm						5μm		7μm	
	Parallelism	15μm									
	Motion parallelism	10μm						10μm	15μm	20μm	25μm
	Pitching/Yawing	20″/15″						25″/20″		30″/ 20″	35″/20″

SENSOR	
Limit sensor	Installed
Origin sensor	–
Slit origin sensor	–
Model	Photo microsensor PM-L25 (Panasonic Industrial Devices SUNX)
Power voltage	DC5～24V ±10%
Consumption current	45mA or less (15mA or less per 1 sensor)
Control output	NPN open collector output DC30V or less 50mA or less Residual voltage 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)

※SPEC is reference for the standard model

URL:http://eng.surugaseiki.com/ E-mail:e-ost@suruga-g.co.jp
TEL.+81-3-6711-5014 FAX.+81-3-6711-5021

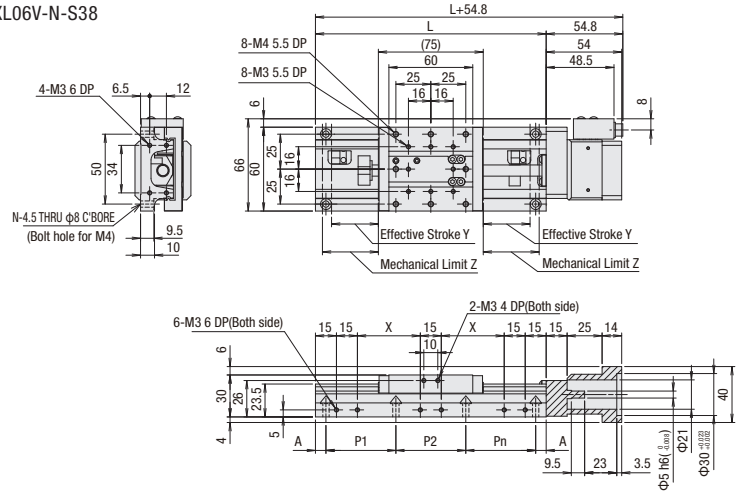
KXL06V-N-P28



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	Z
KXL06030V-N□-P28	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-N□-P28	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-N□-P28	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-N2-P28	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-N2-P28	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-N2-P28	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-N2-P28	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

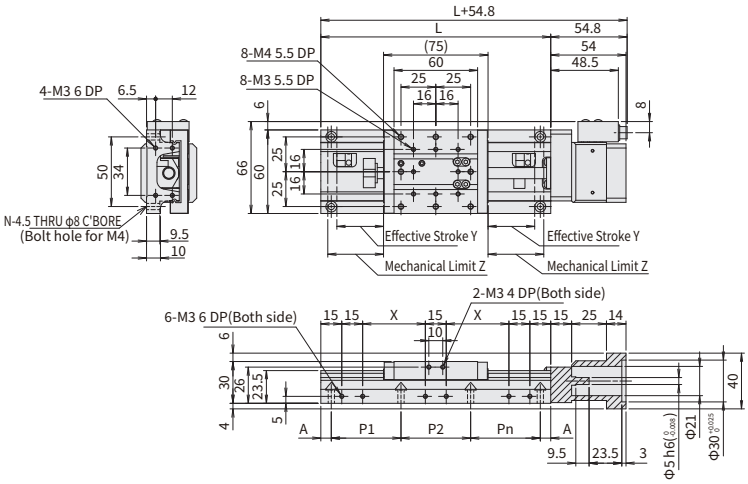
KXL06V-N-S38



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	z
KXL06030V-N□-S38	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-N□-S38	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-N□-S38	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-N2-S38	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-N2-S38	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-N2-S38	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-N2-S38	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

KXL06V-N-S40



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	Z
KXL06030V-N□-S40	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-N□-S40	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-N□-S40	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-N2-S40	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-N2-S40	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-N2-S40	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-N2-S40	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

【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：KXL06V-C

accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Motor Plate			○	-	-
■Coupling (with screws)			○		
■Screws	For Motor		4 of M2.5-6	4 of M3-12	2 of M4-12
	For Motor Plate		2 of M4-8	-	-
	For Main Body	30～100mm	8 of M4-14		
		150mm	14 of M4-14		
		200mm	12 of M4-14		
		300mm	16 of M4-14		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model / Selection code / Option code

KXL06 030V-C1 - P28

1 2 1

1 Travel length

030	30mm
050	50mm
075	75mm
100	100mm
150	150mm
200	200mm
300	300mm

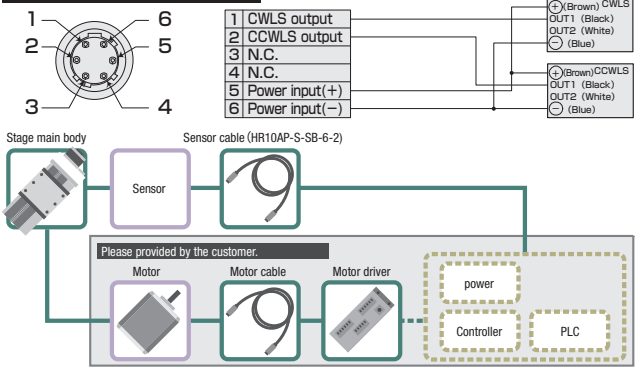
2 Ball screw lead selection

1	Lead 1mm
2	Lead 2mm

1 Application Motor

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

Pin allocation (Sensor)



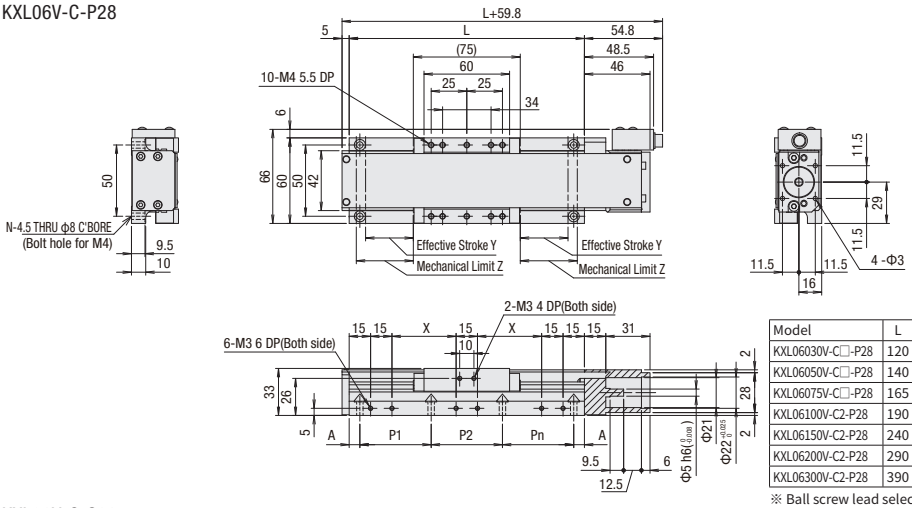
S P E C											
Model		KXL06030V-C1-P28	KXL06030V-C2-P28	KXL06050V-C1-P28	KXL06050V-C2-P28	KXL06075V-C1-P28	KXL06075V-C2-P28	KXL06100V-C2-P28	KXL06150V-C2-P28	KXL06200V-C2-P28	KXL06300V-C2-P28
Mechanical specification	Travel length	30mm		50mm		75mm		100mm	150mm	200mm	300mm
	Table size	60×60mm									
	Feed screw (Ball screw)	φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2	φ8 lead 1	φ8 lead 2	φ8 lead 2	φ8 lead 2	φ8 lead 2	φ8 lead 2
	Guide	Linear ball guide									
	Main materials-Finishing	Stainless-Electroless nickel plating									
Accuracy specification	Resolution (Pulse) Full/Half	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	2μm/1μm	4μm/2μm	4μm/2μm	4μm/2μm	4μm/2μm	4μm/2μm
	Resolution (Pulse) Microstep	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.1μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)	0.2μm (1/20on resolution)
	MAX speed	30mm/sec	35mm/sec	30mm/sec	35mm/sec	30mm/sec	35mm/sec	45mm/sec			
	Uni-directional positioning accuracy	5μm				7μm		10μm	15μm	15μm	25μm
	Repeatability positioning accuracy	±0.5μm									
	Load capacity	12kgf【117.6N】									
	Moment stiffness	Pitch 0.05/yaw 0.05/roll 0.05 [″/N・cm]									
	Lost motion	1μm									
	Backlash	1μm									
	Straightness	3μm						5μm		7μm	
	Parallelism	15μm									
	Motion parallelism	10μm						10μm	15μm	20μm	25μm
	Pitching/Yawing	20″/15″						25″/20″		30″/20″	35″/20″

SENSOR	
Limit sensor	Installed
Origin sensor	–
Slit origin sensor	–
Model	Photo microsensor PM-L25 (Panasonic Industrial Devices SUNX)
Power voltage	DC5～24V ±10%
Consumptioncurrent	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)

※SPEC is reference for the standard model

URL:http://eng.surugaseiki.com/ E-mail:e-ost@suruga-g.co.jp
TEL.+81-3-6711-5014 FAX.+81-3-6711-5021

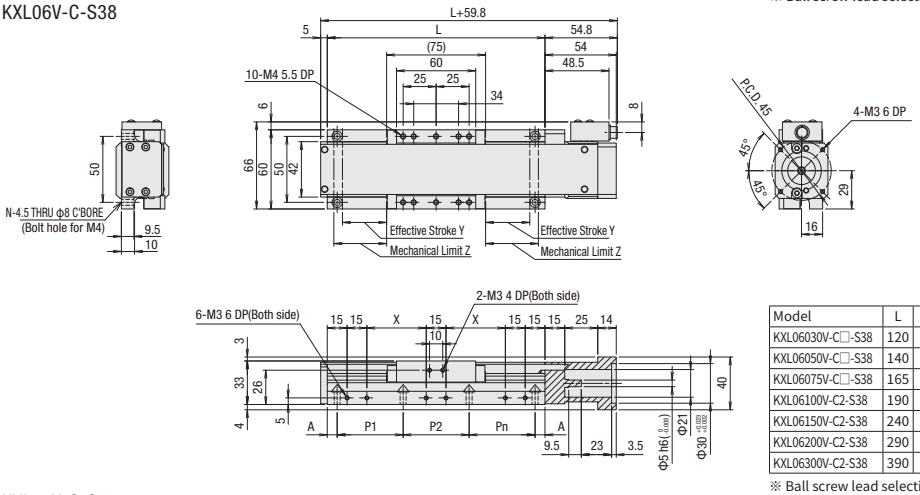
KXL06V-C-P28



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	Z
KXL06030V-C□-P28	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-C□-P28	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-C□-P28	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-C2-P28	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-C2-P28	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-C2-P28	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-C2-P28	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

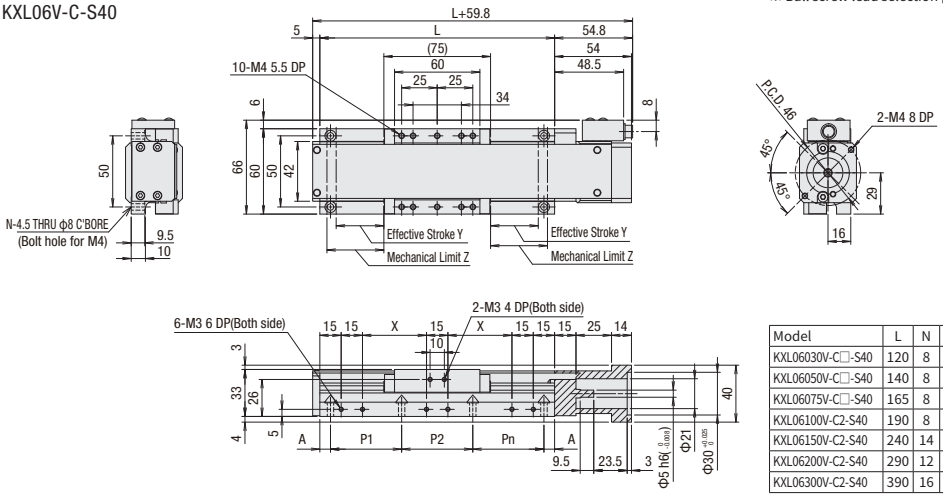
KXL06V-C-S38



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	Z
KXL06030V-C□-S38	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-C□-S38	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-C□-S38	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-C2-S38	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-C2-S38	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-C2-S38	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-C2-S38	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

KXL06V-C-S40



Model	L	N	A	P1	P2	P3	P4	P5	P6	P7	X	Y	Z
KXL06030V-C□-S40	120	8	10	25	50	25	—	—	—	—	22.5	11	17.5
KXL06050V-C□-S40	140	8	20	25	50	25	—	—	—	—	32.5	21	27.5
KXL06075V-C□-S40	165	8	7.5	50	50	50	—	—	—	—	45	33.5	40
KXL06100V-C2-S40	190	8	20	50	50	50	—	—	—	—	57.5	46	52.5
KXL06150V-C2-S40	240	14	20	50	25	25	25	25	50	—	82.5	71	77.5
KXL06200V-C2-S40	290	12	20	50	50	50	50	50	—	—	107.5	96	102.5
KXL06300V-C2-S40	390	16	20	50	50	50	50	50	50	50	157.5	146	152.5

※ Ball screw lead selection [1 or 2]

【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.

Ball Screw Type Sinemotion Goniometer Stages□60：KGB06V

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

Model / Selection code / Option code

KGB06 050V - L - P28

1 2 1

1 Height of center rotation (W.D)

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

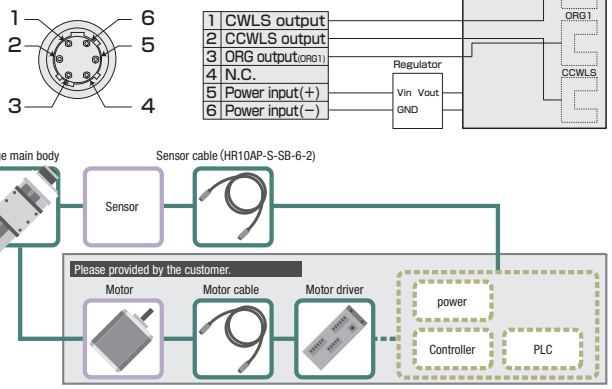
2 Sensor cover location

L	L position
R	Opposite hand

1 Application Motor

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

Pin allocation (Sensor)

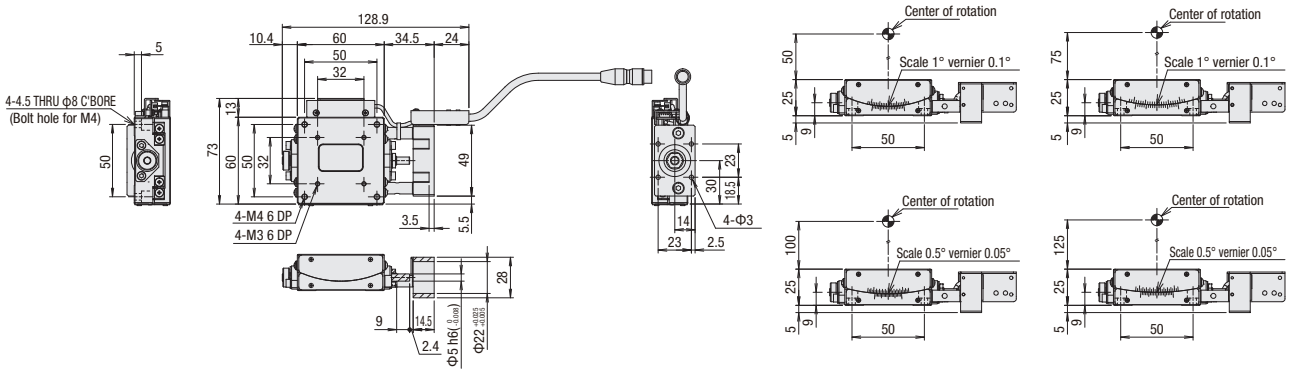


S P E C					
Model		KGB06050V-L-P28	KGB06075V-L-P28	KGB06100V-L-P28	KGB06125V-L-P28
Mechanical specification/Dimensional tolerance	Travel length	±8.5°	±5.5°	±5°	±4°
	Table size	60×60mm			
	Travel mechanism	Ball screw ϕ6 lead 1			
	Guide	Crossed roller guide			
	Main materials-Finishing	Aluminum—Black almite finishing			
	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)	≒0.0021°	≒0.0014°	≒0.0011°	≒0.0009°
	MAX speed	31.5°/sec [15kHz]	21°/sec [15kHz]	16.5°/sec [15kHz]	13.5°/sec [15kHz]
	Repeatability positioning accuracy	±0.001°			
	Load capacity	5kgf【49N】			
	Moment stiffness	Pitch 0.30/yaw 0.10/roll 0.11 ["/N・cm]			
	Lost motion	0.003°			

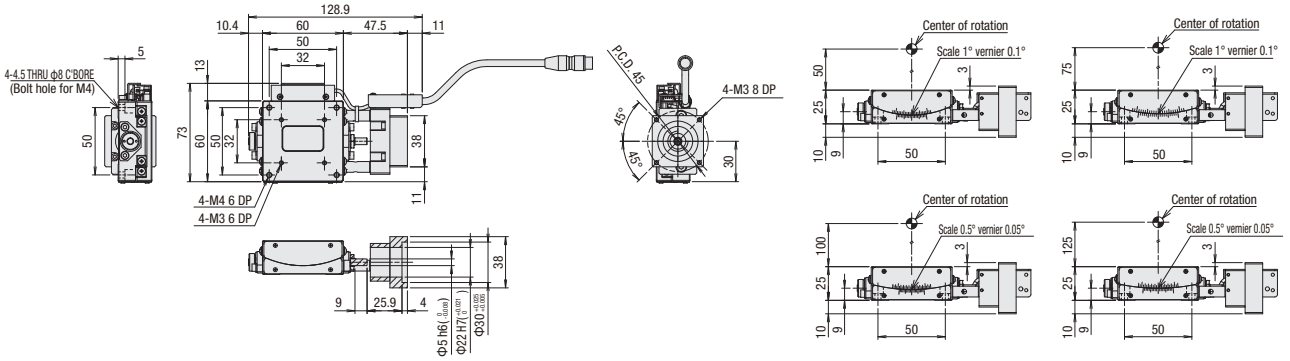
SENSOR	
Limit sensor	Installed
Origin sensor	Installed
Slit origin sensor	—
Model	Photo microsensor EE-SX4320 (Omron Co., Ltd.)
Power voltage	DC5～24V ±10%
Consumption current	Total 60mA or less
Control output	NPN open collector output DC5~24V 8mA or less Residual voltage 0.3V or less when the load current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

※SPEC is reference for the standard model

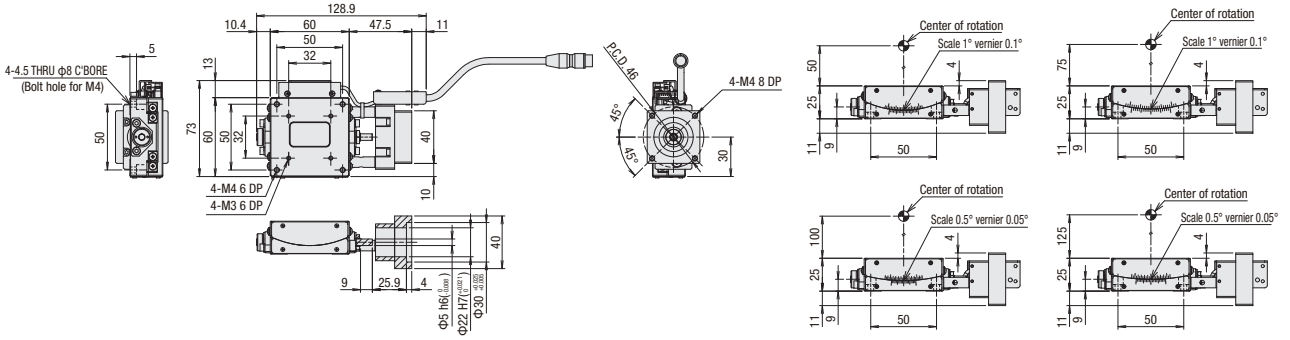
KGB06V-P28



KGB06V-S38



KGB06V-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.

Sinemotion Rotary Stage ϕ40：KRB04017V

accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor		4 of M2.5-6	4 of M3-12	2 of M4-12
	For Main Body	KRB04	3 of M3-25		
		KRB06	3 of M4-25		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model

KRB04017V-P28

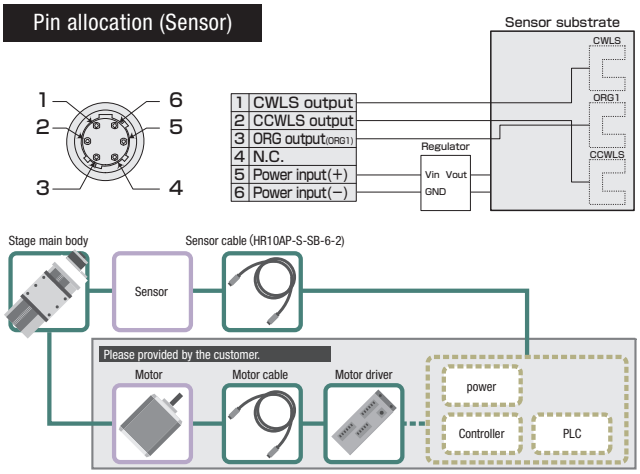
Option code

1

1 Application Motor

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

Pin allocation (Sensor)



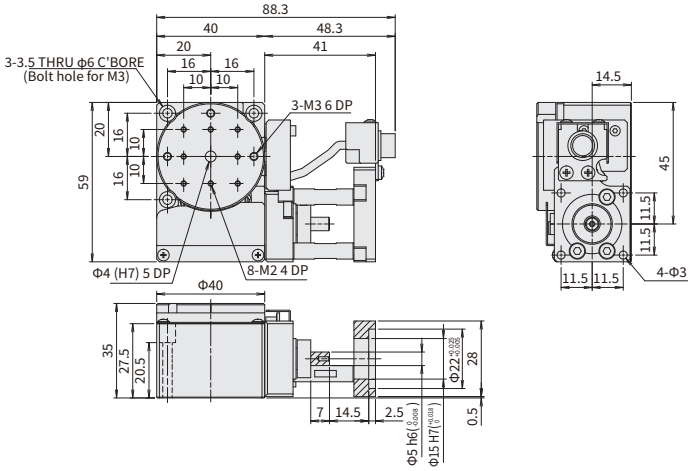
S P E C				
Model		KRB04017V-P28	KRB04017V-S38	KRB04017V-S40
Mechanical specification	Travel length	±8.5°		
	Table size	ϕ40mm		
	Travel mechanism	Ball screw ϕ6 lead 1		
	Guide	Combination angular ball bearing		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Resolution (Pulse)	≒0.0067° (Full)		
	MAX speed	102°/sec [15kHz]		
	Repeatability positioning accuracy	±0.003°		
	Load capacity	4.0kgf【39.2N】		
	Moment stiffness	0.52″/N・cm		
	Lost motion	0.003°		
	Backlash	0.01°		
	Parallelism	50μm		

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)

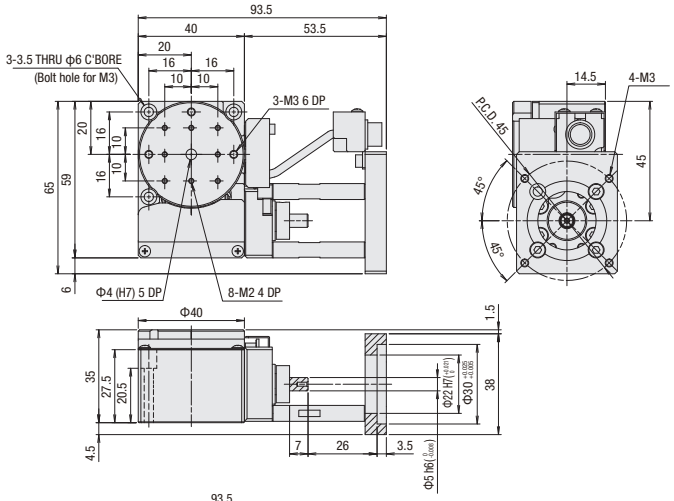
※SPEC is reference for the standard model

URL：http://eng.surugaseiki.com/ E-mail：e-ost@suruga-g.co.jp
TEL.+81-3-6711-5014 FAX.+81-3-6711-5021

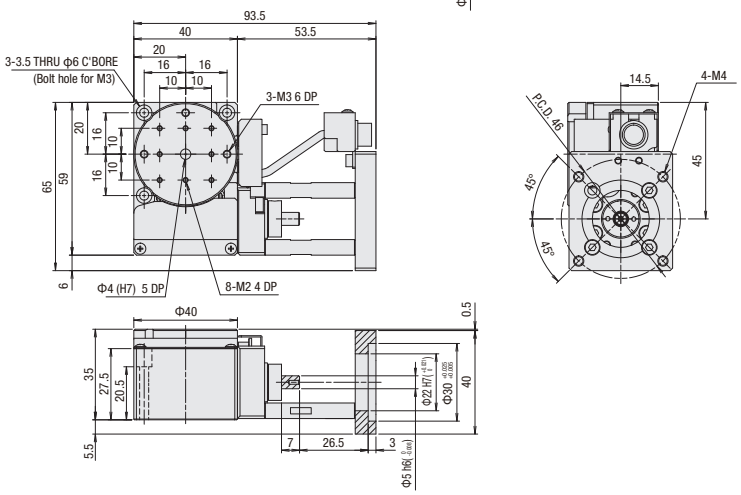
KRB04017V-P28



KRB04017V-S38



KRB04017V-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.

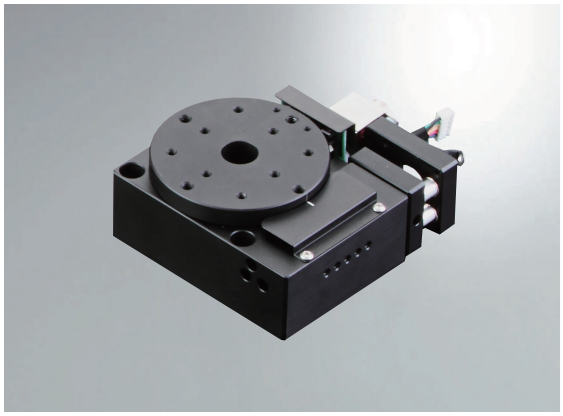
3. Very careful centering is required especially when a main body, motor and coupling is applied.
The operation that not enough centering may cause the damage or deterioration of the product early.
Please see the attached operating and assembly sheet for mounting adjustment.

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.

Sinemotion Rotary Stage ϕ60：KRB06011V



accessories			P28	S38	S40
■Motor bracket (installed on main body)			○		
■Coupling (with screws)			○		
■Screws	For Motor		4 of M2.5-6	4 of M3-12	2 of M4-12
	For Main Body	KRB04	3 of M3-25		
		KRB06	3 of M4-25		
■Sensor cable (2m One end loose)			○(HR10AP-S-SB-6-2)		

Model

KRB06011V-P28

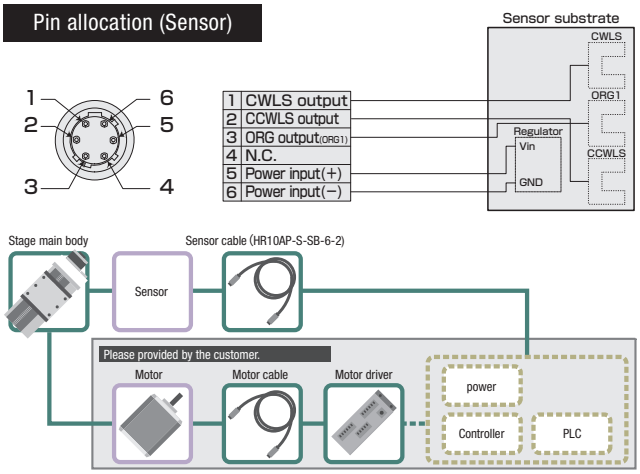
Option code

1

1 Application Motor

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

Pin allocation (Sensor)



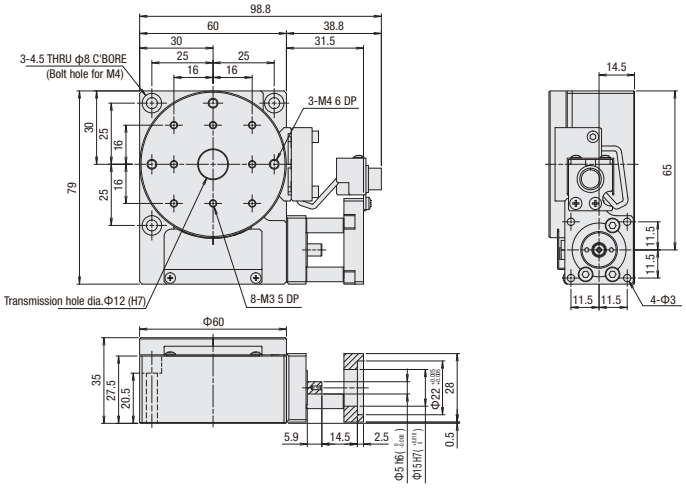
S P E C				
Model		KRB06011V-P28	KRB06011V-S38	KRB06011V-S40
Mechanical specification	Travel length	±5.5°		
	Table size	ϕ60mm		
	Travel mechanism	Ball screw ϕ6 lead 1		
	Guide	Combination angular ball bearing		
	Main materials-Finishing	Aluminum—Black almite finishing		
Accuracy specification	Resolution/Pulse	≒0.0042° (Full)		
	MAX speed	64°/sec [15kHz]		
	Repeatability positioning accuracy	±0.003°		
	Load capacity	6.0kgf【58.8N】		
	Moment stiffness	0.25″/N・cm		
	Lost motion	0.003°		
	Backlash	0.01°		
	Parallelism	50μm		

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)

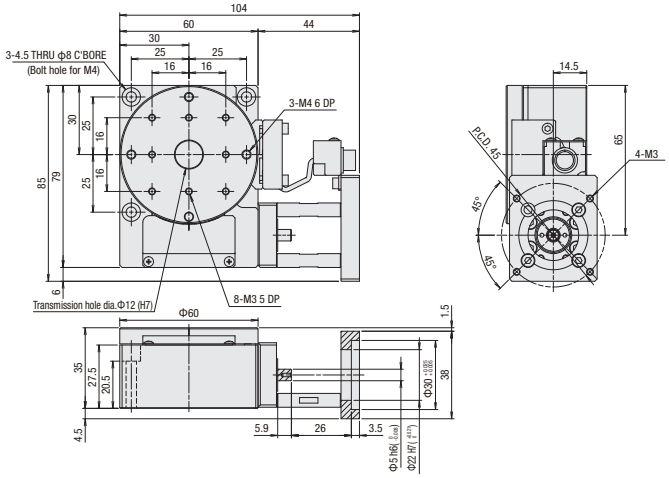
※SPEC is reference for the standard model

URL：http://eng.surugaseiki.com/ E-mail：e-ost@suruga-g.co.jp
TEL.+81-3-6711-5014 FAX.+81-3-6711-5021

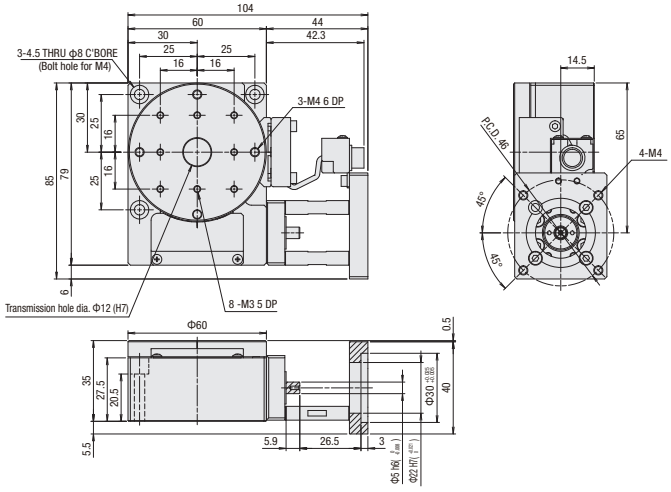
KRB06011V-P28



KRB06011V-S38



KRB06011V-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.