

Motion Control Products




Motion Control Products Guide

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Stepping Motor







X Translation

AC servo

X Translation

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	Translation Motorized Stages, Flat Z axis - 5 Phase Stepping Motor SGSP-ZF	G070

Stepping Motor	X Translation	 Actuator for Objective Lenses (Stepper motor type) SGSP-OBL-3	G072
	Rotation	 Rotation Motorized Stages SGSP-YAW	G074
		 Precision Rotation Motorized Stages KST-YAW	G078
		 High Durability Automatic Rotation Stage HDS-YAW	G080
Goniometer	 Motorized Extended Guide Goniometer OSMS-40A	G082	
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Quality Assurance

We verify the working accuracy when stage assembly is completed. All products we ship are compliant to JIS or have passed company regulations.

Serial Number

A sticker like the one shown in the picture is affixed onto Sigma Koki products. It shows information such as our company logo, part number, and serial number.



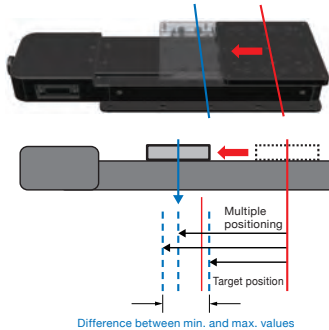
Motorized Stages Guide

Measurement of Linear Stage Accuracy

Positional Accuracy

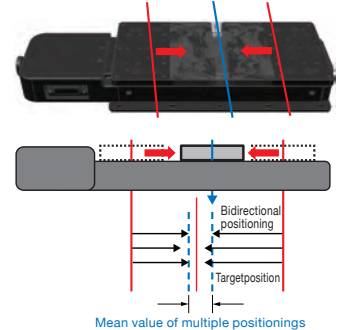
Positioning Accuracy

Positioning is performed successively from the reference position in one direction at a fixed interval across the range of travel. The difference between the target values and measured values at each of the positioning points is calculated, and the difference between the minimum and maximum values is taken to be the positioning accuracy.



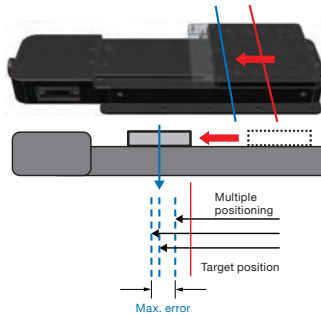
Lost Motion

Positioning is performed multiple times in the (+) forward and (-) backward directions on any position (e.g. both ends or center point) of the stage, and the mean value of the deviation amount with respect to the stop position is calculated. The maximum of the numerical values is taken to be lost motion.



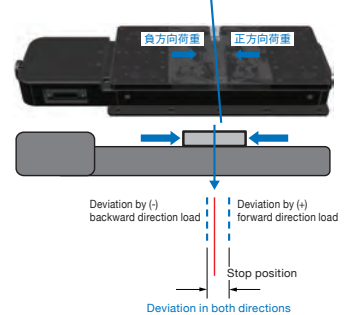
Positional Repeatability

Positioning is performed multiple times from the same direction on any position (e.g. both ends or center point) of the stage, and the maximum value of the deviation amount with respect to the stop position is calculated. The maximum of those numerical values is taken to be positional repeatability.



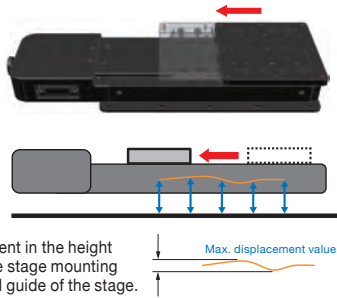
Backlash

A fixed load is applied to the (+) forward or (-) backward direction on any position (e.g. both ends or center point) of the stage. The total deviation in the respective direction at that time is taken to be backlash.



Working Accuracy

Running Parallelism



This is the displacement in the height direction between the stage mounting surface and the travel guide of the stage.

Orthogonality of Motion

Measure the working displacement of the Y axis when referenced to the X axis of the XY axis stage with a square. The displacement at this time is taken to be the orthogonality of motion.

Perpendicularity of Motion

Place a dial gauge on the Z stage, and measure the displacement with respect to a vertical plate. The displacement at this time is taken to be the perpendicularity of motion.

The displacement in the vertical direction of the table during stage motion along the full stroke is taken to be the running parallelism.

(Reference) Measurement Result (OSMS20-35)

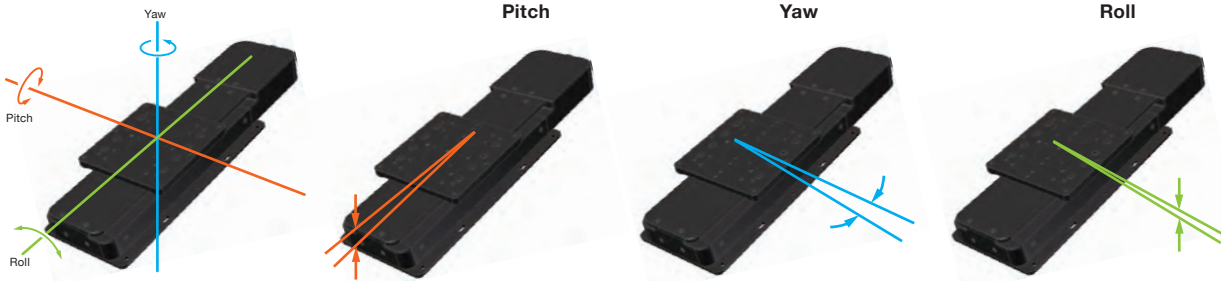
Target Position [μm]	1		2		3		4		5		6		7		8		9		
	0		2500		5000		7500		10000		12500		15000		17500		20000		
Positioning Direction	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	
Position Deviation [μm]	0.0	-1.2	-0.1	-0.5	0.2	-0.8	-0.3	-0.5	-0.1	-1.4	-0.4	-1.1	-1.7	-2.3	0.3	0.1	-1.5	-1.8	
(Measured Value - Target Position)	1st time	-0.6	-1.2	-0.2	-0.4	0.1	-0.7	-0.2	-0.6	-0.3	-1.4	-0.8	-0.9	-1.7	-2.5	0.0	-0.1	-1.5	-1.9
	2nd time	-0.4	-0.9	-0.1	-0.8	0.2	-1.3	-0.4	-0.7	-0.1	-1.3	-0.8	-1.2	-1.5	-2.6	0.3	0.0	-1.5	-1.9
	3rd time	-0.2	-1.6	-0.3	-0.6	-0.2	-0.9	-0.4	-0.6	-0.3	-1.2	-0.8	-1.2	-1.5	-2.5	0.3	-0.2	-1.5	-2.0
	4th time	-1.0	-1.2	-0.3	-0.6	0.0	-1.4	-0.5	-0.6	-0.2	-1.2	-0.6	-1.1	-1.6	-2.6	0.2	-0.1	-1.7	-2.0
	5th time																		
Mean Position Deviation X	-0.44	-1.22	-0.20	-0.58	0.06	-1.02	-0.36	-0.60	-0.20	-1.30	-0.68	-1.10	-1.60	-2.50	0.22	-0.06	-1.54	-1.92	
Standard Deviation X	0.38	0.25	0.10	0.15	0.17	0.31	0.11	0.07	0.10	0.10	0.18	0.12	0.10	0.12	0.13	0.11	0.09	0.08	
X+S	-0.06	-0.97	-0.10	-0.43	0.23	-0.71	-0.25	-0.53	-0.10	-1.20	-0.50	-0.98	-1.50	-2.38	0.35	0.05	-1.45	-1.84	
X-S	-0.82	-1.47	-0.30	-0.73	-0.11	-1.33	-0.47	-0.67	-0.30	-1.40	-0.86	-1.22	-1.70	-2.62	0.09	-0.17	-1.63	-2.00	
Lost Motion B=X ↑ -X ↓	0.78		0.38		1.08		0.24		1.10		0.42		0.90		0.28		0.38		
Maximum (Position Deviation) Value S ↑ +S ↓ + B	1.41		0.63		1.56		0.42		1.30		0.72		1.12		0.52		0.55		
Wobble per Rotation	1.00		0.80		0.80		0.90		0.70		1.60		2.60		1.90				

■Result

Maximum Lost Motion	1.10μm
Average Lost Motion	0.62μm
Positional Repeatability	
Unidirectional Positioning ↑	0.77μm
Unidirectional Positioning ↓	0.62μm
Bidirectional Positioning	1.56μm
Positioning Accuracy	2.97μm
Error per Rotation (maximum)	2.60μm

Moment Stiffness (Pitch/Yaw/Roll)

Moment stiffness is the stage strength against load exerted at a point away from the center of the table face. (The center of the table face does not match the center of gravity of work.) It indicates the degree of tilt of the table face (sec) when 1N load is exerted at a point 1cm away from the center of the stage face.



Angular Accuracy

Pitch

Pitch is the angle displacement of the table face in the pitch direction while the stage is in motion. It indicates the maximum angle displacement during full travel.

Parallelism

It indicates the parallelism of the table fixed on the stage against the base plane.

Yaw

Yaw is the angle displacement of the table face in the yaw direction while the stage is in motion. It indicates the maximum angle displacement during full travel.

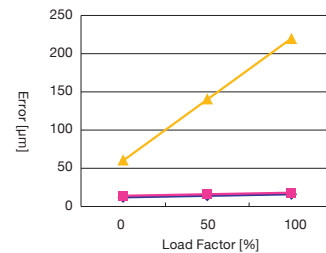
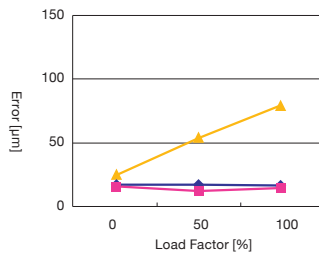
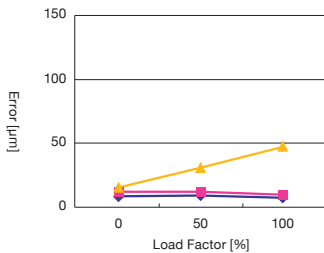
(Reference) Measurement of XY axis Stage Accuracy

OSMS20-85

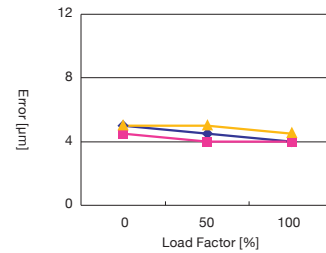
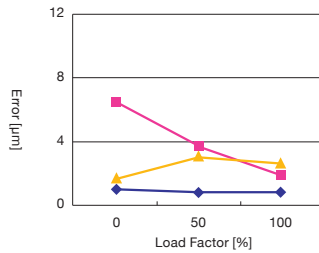
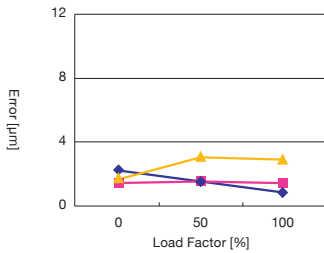
OSMS26-200

OSMS33-300

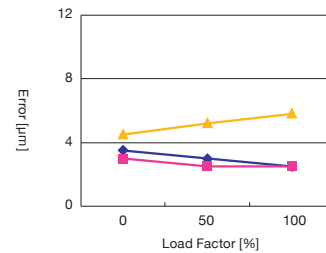
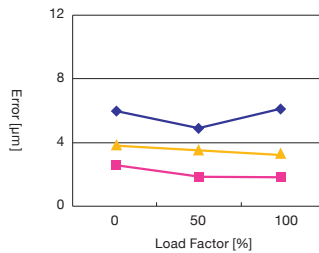
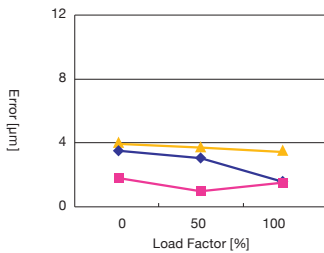
Positioning Accuracy



Positional Repeatability



Lost Motion



Legend: Single axis (blue diamond), X axis of XY (pink square), Y axis of XY (yellow triangle)



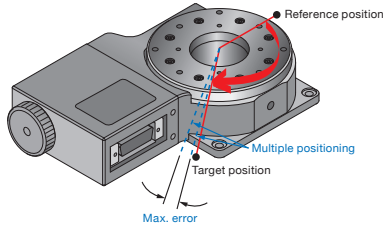
Higher load factor at the travel end of motorized stages increases the deflection on Y axis, resulting in extremely poor positioning accuracy.

Motorized Stages Guide

Measurement of Rotation Stage Accuracy

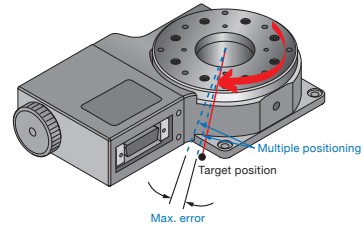
Positional Accuracy

Positioning Accuracy



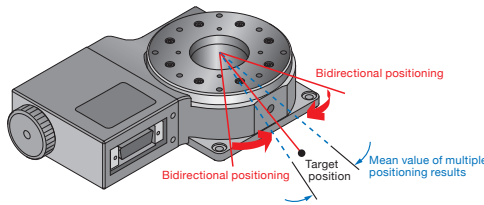
Positioning is performed successively from the reference position in one direction at a fixed interval across almost the entire range of travel. The difference between the target values and measured values at each of the positioning points is calculated, and the difference between the minimum and maximum values is taken to be the positioning accuracy.

Positional Repeatability



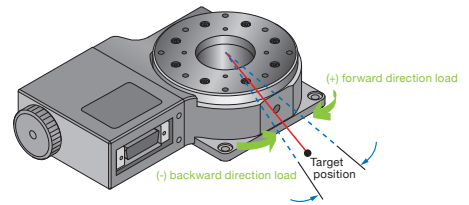
Positioning is performed multiple times from the same direction on any position of the stage, and the maximum value of the deviation amount with respect to the stop position is calculated. The maximum of those numerical values is taken to be positional repeatability.

Lost Motion



Positioning is performed multiple times in the (+) forward and (-) backward directions on any position (e.g. both ends or center point) of the stage, and the mean value of the deviation amount with respect to the stop position is calculated. The maximum of the numerical values is taken to be lost motion.

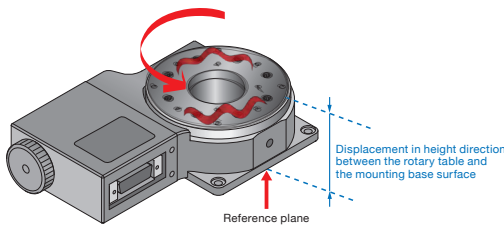
Backlash



A fixed load is applied to the (+) forward or (-) backward direction on any position of the stage. The total deviation in the respective direction at that time is taken to be backlash.

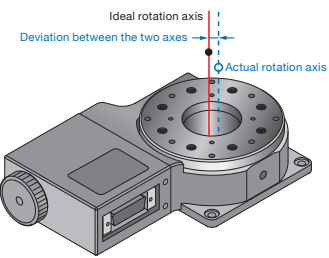
Working Accuracy

Wobble



Wobble is the maximum displacement in the height direction between the rotary table and the mounting base surface when the rotation stage is rotated once.

Concentricity



Concentricity is the difference between the ideal rotation center and the actual rotation center when the rotation stage is rotated once.

(Reference) Measurement Result (SGSP-60YAW-0B)

	0	1	2	3	4	5	6	7	8	9	10	11	12														
Target Position [°]	0	29	58	87	116	145	174	203	232	261	290	319	348														
Positioning Direction	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓	↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓ ↑ ↓													
Position Deviation [°]	0.000	0.015	-0.009	0.003	-0.010	-0.001	-0.013	-0.004	-0.012	0.001	-0.007	0.009	-0.007	0.009	0.000	0.012	0.004	0.016	0.002	0.015	0.007	0.020	0.000	0.013	-0.001	0.010	
(Measured Value - Target Position)	2nd time	0.002	0.015	-0.007	0.003	-0.009	-0.001	-0.012	-0.004	-0.012	0.001	-0.006	0.009	-0.007	0.009	-0.001	0.013	0.004	0.016	0.002	0.015	0.007	0.020	0.000	0.013	-0.001	0.011
	3rd time	0.003	0.015	-0.007	0.003	-0.009	-0.001	-0.012	-0.004	-0.012	0.001	-0.007	0.009	-0.007	0.009	-0.001	0.013	0.004	0.016	0.002	0.015	0.007	0.020	0.000	0.014	-0.001	0.011
	4th time	0.003	0.016	-0.007	0.003	-0.009	-0.001	-0.013	-0.004	-0.012	0.000	-0.006	0.009	-0.007	0.009	-0.001	0.013	0.004	0.016	0.002	0.015	0.007	0.020	-0.001	0.014	-0.001	0.011
	5th time	0.002	0.016	-0.007	0.004	-0.009	-0.001	-0.013	-0.004	-0.012	0.001	-0.007	0.009	-0.007	0.009	-0.001	0.014	0.003	0.016	0.002	0.015	0.007	0.020	-0.001	0.014	-0.001	0.011
Mean Position Deviation X		0.002	0.015	-0.007	0.003	-0.010	-0.001	-0.012	-0.004	-0.012	0.001	-0.007	0.009	-0.007	0.009	-0.001	0.013	0.004	0.016	0.002	0.015	0.007	0.020	0.000	0.014	-0.001	0.011
Standard Deviation X		0.001	0.000	-0.001	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X+S		0.003	0.016	-0.007	0.004	-0.009	-0.001	-0.012	-0.004	-0.012	0.001	-0.006	0.009	-0.007	0.009	0.000	0.013	0.004	0.016	0.002	0.015	0.007	0.020	0.000	0.014	-0.001	0.011
X-S		0.001	0.015	-0.008	0.003	-0.010	-0.001	-0.013	-0.004	-0.012	0.000	-0.007	0.009	-0.007	0.009	-0.001	0.013	0.003	0.016	0.002	0.015	0.007	0.020	-0.001	0.013	-0.001	0.010
Lost Motion B=X↑-X↓		0.0135	0.0107	0.0084	0.0088	0.0125	0.0154	0.0163	0.0136	0.0122	0.0127	0.0130	0.0139	0.0120													
Maximum (Position Deviation) Value S↑+S↓+ B		0.0148	0.0116	0.0091	0.0091	0.0129	0.0158	0.0168	0.0142	0.0127	0.0131	0.0133	0.0144	0.0125													

Result	Maximum Lost Motion	0.0163°	Wobble Accuracy	12μm
	Positional Repeatability		Parallelism	27μm
	Unidirectional Positioning ↑	0.0022°	Concentricity	8μm
	↓	0.0009°		
	Bidirectional Positioning	0.0168°		
	Positioning Accuracy	0.0330°		
	Error per Rotation (maximum)	2.60°		

- Application Systems
- Optics & Optical Coatings
- Holders
- Bases
- Manual Stages
- Actuators

Motorized Stages

- Light Sources
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Guide

- Controllers/Drivers
- Softwares

Stepping Motor

AC Servo Motor

Cables

Piezo

X Translation

Theta Rotation

Goniometer

Vacuum

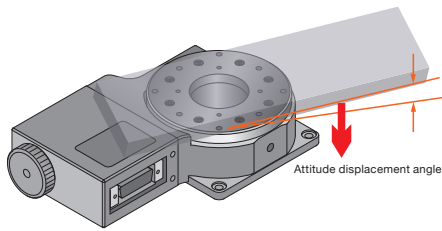
Options

- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm

Others

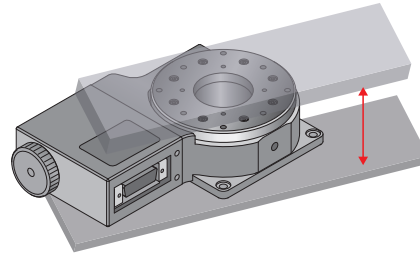
Angular Accuracy

Moment Stiffness



The angular displacement of the stage when unit moment load is applied.

Parallelism



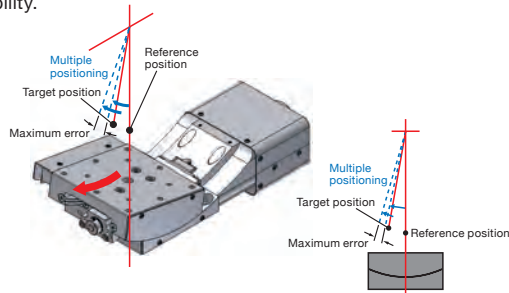
The parallelism of the table fixed on the stage against the base plane.

Measurement of Goniometer Stage Accuracy

Positional Accuracy

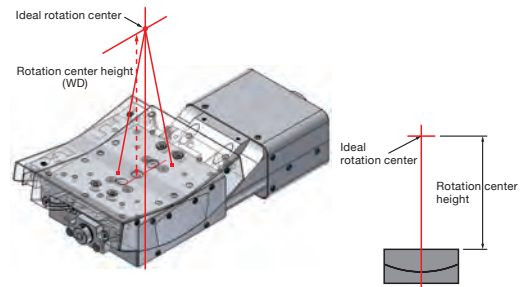
Positional Repeatability

Positioning is performed multiple times from the same direction on any position of the stage, and the maximum value of the deviation amount with respect to the stop position is calculated. The maximum of those numerical values is taken to be positional repeatability.



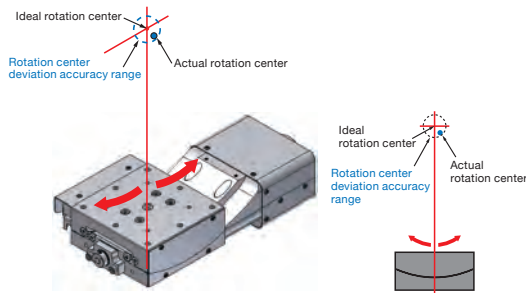
Rotation Center Height

The distance to the top surface of the table from the ideal rotation center.



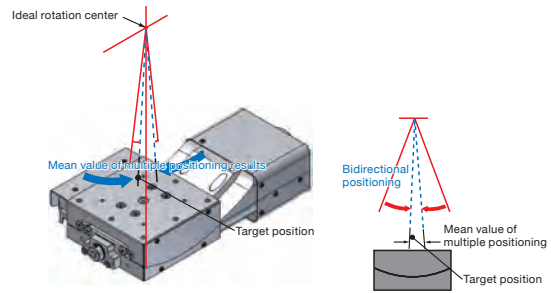
Rotation Center Deviation Accuracy

The maximum deviation range from the ideal rotation center position when a goniometer stage is moved throughout the full travel.



Lost Motion

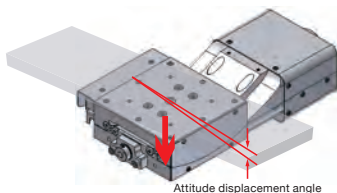
Positioning is performed multiple times in the (+) forward and (-) backward directions on any position (e.g. both ends or center point) of the stage, and the mean value of the deviation amount with respect to the stop position is calculated. The maximum of the numerical values is taken to be lost motion.



Angular Accuracy

Moment Stiffness

The angular displacement of the stage when unit moment load is applied.



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Options

40mm

60mm

80mm

85mm

100mm

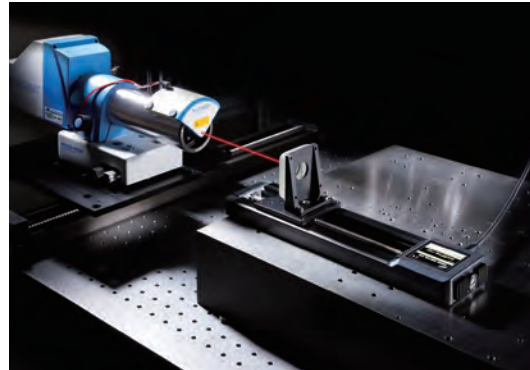
120mm

Others

Motorized Stages Guide

Accuracy Verification

Motorized stage accuracy is, in principle, confirmed in compliance with the JIS test code for machine tools (JIS B 6190). In addition, all measuring instruments are traceable standard instruments compliant to the national standard.



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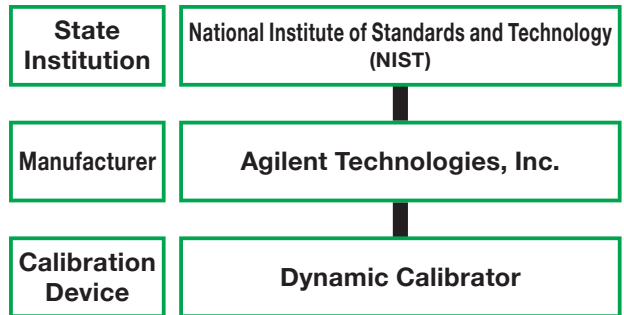
Options

- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

Category	Measurement Item	Device Used	Standards
Linear Stage	Positioning Accuracy	Dynamic Calibrator (HP5529A)	JIS B 6190
	Positional Repeatability		
	Lost Motion		
	Running Parallelism	Dial Indicator	Company Standard
	Pitch/Yaw	Auto Collimator	Company Standard

It has to be guaranteed that measured values and indicated values are within the specification range of international standard values. In other words, traceability must be ensured. JIS defined this traceability as “the capacity to trace measurement results back to the domestic measurement standards, with the use of measuring instruments that have gone through a sequence of calibrations with high-ranking standards.”

Linear Stage Traceability System Diagram



Category	Measurement Item	Device Used	Standards
Rotation Stage	Positional Repeatability	Rotary Encoder	Company Standard
	Lost Motion		
	Wobble Accuracy	Dial Indicator	Company Standard
Goniometer Stage	Positional Repeatability	Rotary Encoder	Company Standard
	Lost Motion		
	Rotation Center Height	Three Dimensional Instrumentation	Company Standard
	Rotation Center Deviation Accuracy		

Accuracy Check in Assembled State

We check accuracy of motorized stages as a single unit. Regarding the accuracy check in assembled state, we need to confirm use conditions etc. Contact our International Sales Division separately.

Accuracy Check at Delivery Destination

We cannot conduct accuracy check at delivery destinations. We will request a check from organizations such as Japan Quality Assurance Organization as necessary. Contact our International Sales Division separately for more information.

Interpretation of the Specification Table

Specifications				
1...	Part Number	**_**		
2...	Opposite Model	**_**R		
3...	Mechanical Specifications	Travel	**mm	
4...		Table Size	**x**mm	
5...		Feed Screw		
6...		Positioning Slide		
7...		Stage Material		
8...	Weight	**kg		
9...	Accuracy Specifications	Resolution	(Full)	**μm/pulse
10...			(Half)	**μm/pulse
11...		MAX Speed	**mm/sec	
12...		Repeatability	**μm	
13...		Positional Repeatability	**μm	
14...		Load Capacity	**N (**kgf)	
14...		Moment Stiffness	Pitch	**"/N·cm
			Yaw	**"/N·cm
			Roll	**"/N·cm
15...		Lost Motion	**μm	
16...	Backlash	**μm		
17...	Parallelism	**μm		
18...	Running Parallelism	**μm		
19...	Orthogonality of Motion	**μm		
20...	Perpendicularity of Motion	**μm		
21...	Pitch / Yaw	**"/**"		
22...	Sensor	Sensor Part Number		
23...		Limit Sensor		
24...		Origin Sensor		
25...		Proximity Origin Sensor		

Motor / Sensor Specifications			
26...	Motor	Type	
27...		Motor Part Number	
28...		Step Angle	
29...	Sensor	Power Voltage	
30...		Current Consumption	
31...		Control Output	
32...		Output Logic	

Compatible Driver / Controller			
33...	Control System	Compatible Driver	
34...		Compatible Controller	

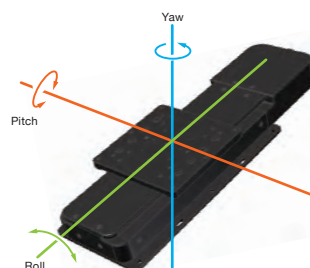
1	Part Number	
2	Opposite Model	
[Mechanical Specifications]		
3	Travel	Indicates the full travel.
4	Table Size	Size of top table face.
5	Feed Screw	* Ball screw * Precision ground screws
6	Positioning Slide	* Outer rail structure * Crossed roller guide
7	Stage Material	Material used for the product.
8	Weight	Self weight of the product.
[Accuracy Specifications]		
9	Resolution (Full) (Half)	Refer to the accuracy verification page for more information. Reference G004 – G007 Travel per pulse for full step Travel per pulse for half step
10	MAX Speed	MAX speed of the product (maximum travel speed).
11	Positioning Accuracy	Deviation between the measured value and the target value at the positioning point.
12	Positional Repeatability	Deviation in stop positions when unidirectional positioning is performed multiple times.
13	Load Capacity	Load capacity at the center of the stage.
14	Moment Stiffness	Stage strength against a load exerted at a position away from the center of the table top (the table center and the center of gravity of a work does not match). It indicates the degree of tilt of the table top (°) when 1N load is exerted at the position 1cm away from the center of the stage surface.
	Pitch	Stiffness in the direction of tilt around the axis in the horizontal plane perpendicular to the direction of travel when moving the stage for full travel.
	Yaw	Stiffness in the direction of tilt around the axis in the vertical plane perpendicular to the direction of travel when moving the stage for full travel.
	Roll	Stiffness in the direction of tilt around the axis in the horizontal plane parallel to the direction of travel when moving the stage for full travel.
15	Lost Motion	Deviation between the stop position of forward positioning and that of backward positioning.
16	Backlash	Deviation in each direction when a certain load is exerted in forward and backward directions at an arbitrary position on the stage.
17	Parallelism	The parallelism of the table fixed on the stage against the base plane. * Note that it is different from "Running Parallelism".
18	Running Parallelism	Displacement in the vertical direction of the table during stage motion along the full travel.
19	Orthogonality of Motion	Working displacement in the direction perpendicular to the Y axis when referenced to the X axis motion of the XY axis stage.
20	Perpendicularity of Motion	Displacement between the Z axis stage and the perpendicular optical breadboard when moving the stage for full travel.
21	Pitch	Maximum angle displacement in the direction of tilt around the axis in the horizontal plane perpendicular to the direction of travel when moving the stage for full travel.
	Yaw	Maximum angle displacement in the direction of tilt around the axis in the vertical plane perpendicular to the direction of travel when moving the stage for full travel.
[Sensor]		
22	Sensor Part Number	Sensor used for the product.
23	Limit Sensor	Indicates whether fitted with a limit sensor.
24	Origin Sensor	Indicates whether fitted with an origin sensor.
25	Proximity Origin Sensor	Indicates whether fitted with a proximity origin sensor.
[Motor Specifications]		
26	Type	Type of motor.
27	Motor Part Number	Part number of motor used for the product.
28	Step Angle	Step angle of the motor.
[Sensor Specifications]		
29	Power Voltage	Specifications of the sensor.
30	Current Consumption	
31	Control Output	
32	Output Logic	
[Compatible Driver / Controller]		
33	Compatible Driver	Driver/controller compatible with the product.
34	Compatible Controller	

[Memo]

The drawing shows the types of tilt when a linear stage travels.

Towards the direction of travel...

- Pitch Rotation around the axis in the horizontal plane perpendicular to the direction of travel
- Yaw Rotation around the axis in the vertical plane perpendicular to the direction of travel
- Roll Rotation around the axis in the horizontal plane parallel to the direction of travel



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40mm

60mm

80mm

85mm

100mm

120mm

Others

Stepping Motors Guide

Operating Environment of Motorized Stages

Use motorized positioning stages within the following operational environment temperature range.

Contact our International Sales Division separately if you desire to use the stages outside the operational environment temperature range.

*Operating environment

Temperature: 5°C – 40°C

Humidity: 30% – 80% (without condensation)

*Recommended environment

Temperature: 23°C ±5°

Humidity: 60±10% (without condensation)

Operational environment temperature changes depending on various conditions such as the type of motorized positioning stage, installation and operation conditions.

Avoid use of the stages in the following sites.

- Sites subject to water or oil
- Sites subject to direct sunlight or radiant heat
- Sites subject to dirt and dust
- Sites subject to vibration or impact
- Sites close to fire
- Sites subject to inflammable gas and corrosive gas

Life Cycle

Although the life cycle varies depending on intended use or application, 2,000 to 3,000 hours for linear systems and 1,000 to 1,500 hours/year (about 3 to 4 hours/day) for rotation/goniometer systems are assumed.

Note that the above assumption may not apply to repeated operations (high-speed drive or high-load drive). Careful maintenance or supply of grease is important for using the products for a long time without a problem.

Reference G018 Maintenance / Grease Replacement

Storage

When not using motorized stages for a long time, store motorized stages wrapped with anti-rust paper, or store in a plastic bag with a desiccant.

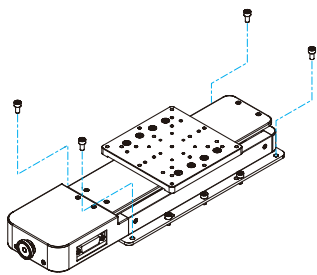
Storage Temperature: 0°C – 40°C

Humidity: 10% – 85% (without condensation)

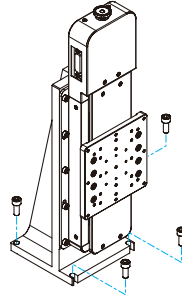
Example of Installation Procedure

Linear

OSMS

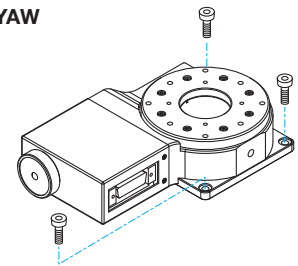


OSMS-(Z)



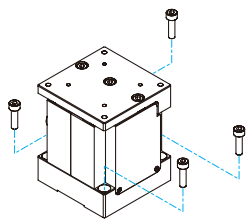
Rotation

SGSP-YAW

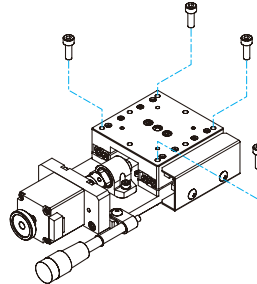


Goniometer

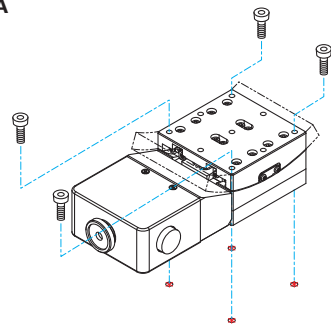
OSMS-ZF



HPS



SGSP-A



Attention

- ▶ Recommended parallelism for stage mounting surface is 0.02 or lower. A product might be warped when it exceeds 0.02, causing abnormal operation.
- ▶ When mounting another product on the upper table of a motorized stage, make sure that the stage is not subjected to abnormal external force.
- ▶ Foreign substances in tapped holes on the upper table or on the side of the stage will cause malfunction.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Mounting Orientation

The values in the specifications of each product are based on installation on a level surface.

Note that load capacity and other precision values will significantly change for upside down, lateral horizontal and other installation orientations, because mounting on other than the horizontal surface require securing with screws.

Category	Series Name	Positioning Slide	Upside Down	Lateral Horizontal	Lateral Vertical
Linear	OSMS	Outer Rail	○	○	○
	HPS	Ball Guide	○	○	△
	TAMM, KST	Crossed Roller	○	○	△
Rotation	SGSP-YAW	Worm and Worm Wheel	○	△	△
	HDS-YAW	Bearing	○	△	△
	KST	Crossed Roller	○	○	△
Goniometer	OSMS-A/B	Ball Guide	○	○	△
	SGSP-A/B	Crossed Roller	○	△	△

○: Possible with limits on load capacity and other accuracy.

△: Possible depending on the model, with limits on load capacity and other accuracy.



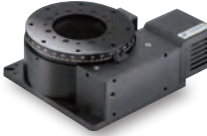




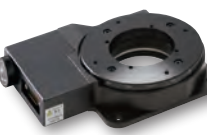

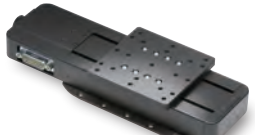
×: Not allowed

Please contact our International Sales Division regarding other unclear points related to mounting orientation.

Selection Guide

Motorized stages are categorized in several different travel axes and types by the differences in structure or positioning slide.

Since precision, stiffness and price differ depending on the type, select a product ideal for the intended purpose.

Precision	Linear		Rotation		Goniometer	
	Series Name	Relevant Product	Series Name	Relevant Product	Series Name	Relevant Product
 High Bottom	KST Crossed Roller Reference > G062 -		KST Bearing Reference > G078			
	TAMM Crossed Roller Reference > G060		HDS-YAW Bearing Reference > G080			
	HPS Ball Guide Reference > G060		SGSP Bearing Reference > G074 -		OSMS Ball Guide Reference > G082	
	OSMS Outer Rail Reference > G032 -					

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40mm

60mm

80mm

85mm

100mm

120mm

Others

Stepping Motors Guide

Linear

HPS Series

RoHS

Durable linear stages with excellent cost performance.



Motor Variation

Compatible with 2 phase stepping motor, a stepping motor and AC servo motor manufactured by Oriental Motor Co., Ltd. in addition to the standard 5 phase stepping motor.

Low Price

Integration of the main unit and guide has reduced the number of parts and assembly man-hours, offering low price.

High Durability

Ball screws are used for the feed mechanism to achieve both low price and durability.

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Motorized Stages

OSMS Series

RoHS

CE

Stepping motor stages compatible with versatile travel range between 35 to 500mm and can be used in any orientation.



Slim Body

These stages are our standard CE-compliant motorized stages, covering motors neatly. These stages offer attractive range of travel by fully utilizing the features of the outer rails.

Line Up

Full closed loop control for stage table positioning, and linear encoder version for coordinate counting are standard line up.

Option

Various options are available according to the application. Geared motors and electromagnetic brakes are available for high-load specifications and Z axis specifications, respectively. Contact our International Sales Division for more information.

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm

Others

Safety Cover

Safety specifications of these stages are compliant with safety requirements on electrical measuring and control equipment and electrical equipment for laboratory use (EN61010-1:2010).

Slim Body

The structure in which the U-shaped outer rail and inner block with center integrated ball screw offers high stiffness, high precision and minimum footprint.

Base Plate

Stages can be installed by securing with bolts without removing their covers. If rigidity is required, the base plates can be removed.

5 Phase Stepping Motor

Achieves the minimum size and minimum weight with high speed and high torque. The rated current is 0.75A/phase which is common to all sizes.

XY axis mounting becomes easier.



Two single axis stages can be assembled directly and used as an XY axis stage without the need of XY-axis mounting plates.

<Line Up>

Part Number	Table Size [mm]	Wide [mm]	Height [mm]	Travel [mm]	Load Capacity [N]
OSMS20-35(X)	85×85	85	35.7	35	78.4
OSMS20-85(X)	85×85	85	35.7	85	78.4
OSMS26-50(X)	100×100	100	42	50	117
OSMS26-100(X)	100×100	100	42	100	117
OSMS26-200(X)	100×100	100	42	200	117
OSMS26-300(X)	100×100	100	42	300	117
OSMS33-300(X)	120×120	120	57	300	196
OSMS33-500(X)	120×120	120	57	500	196



Translation Motorized Stages, Flat Z axis - 5 Phase Stepping Motor

Motorized Extended Guide Goniometer



TAMM Series

RoHS

Motorized crossed roller stages that combine compactness, low-profile and high durability



High Durability

Line contact with rollers and V groove rail offers high stiffness, low friction and virtually no differential slip, suitable for minute feeding.

Compact/ Low-profile

"Ideal for space-saving and assembly of systems with low optical axis."

Sizes

□40/□60/□100mm are available.

KST Series

RoHS



High Precision

High precision stages with steel body relatively strong against heat, and in which precision ball screws and crossed roller guide are arranged with highest precision.

High Load Capacity

Achieved the maximum load capacity of 392N (40.0kgf).

High Stability

Steel body fitted with large table face can mount anything.

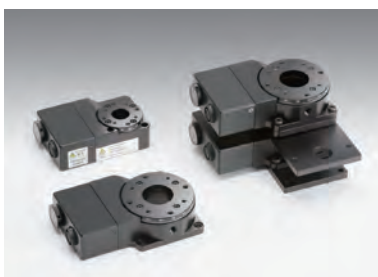
Rotation

SGSP-YAW Series

RoHS

CE

Stepping motor driven rotation stages fitted with bearing guide and worm gear feed mechanism



Low Price

Number of parts and assembly time were reduced to lower the price.

Compact/ Low-profile

Ideal for space-saving and assembly of systems with low optical axis.

Sizes

φ40/φ60/φ80/φ120/φ160mm are available.

HDS-YAW

RoHS

High durability rotation motorized stages for minute angle adjustment.



High Durability

Ball screws and steel belts used in the drive mechanism offer excellent durability in minute angles.

Isokinetic

Since it converts linear motion by the ball screw into rotational motion by the steel belt, there is no difference between traveling center and end by rotation speed and resolution.

Sizes

φ40/φ60/φ80/φ120/φ160mm are available.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

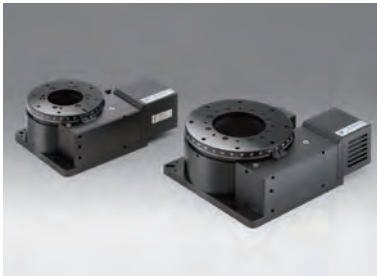
Others

Stepping Motors Guide

KST-YAW Series

RoHS CE

High precision and high stability rotation motorized stages fitted with bearing positioning slide



High Precision High repeatability stages fitted with bearing positioning slide.

High Load Capacity Achieved the maximum load capacity of 392N (40.0kgf).

High Stability Steel body fitted with large table face can mount anything.

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40mm

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80mm

85mm

100mm

120mm

Others

Goniometer

OSMS Series

RoHS CE

High precision motorized goniometers with integrated bearing ways for superior stiffness, accuracy and durability



Their smooth movement is ideal for frequent angle adjustment.

Low Price Number of parts and assembly time were reduced to lower the price.

High Precision High Stiffness High Durability Integrated ball guide structure in which guides are directly processed on the main body minimized machining/assembly errors and improved rotation center accuracy.

SGSP-A/B Series

RoHS

Stepping motor driven motorized goniometer stages fitted with crossed roller guide



High Stiffness High stiffness goniometer stages fitted with excellent abrasion resistant crossed roller guide.

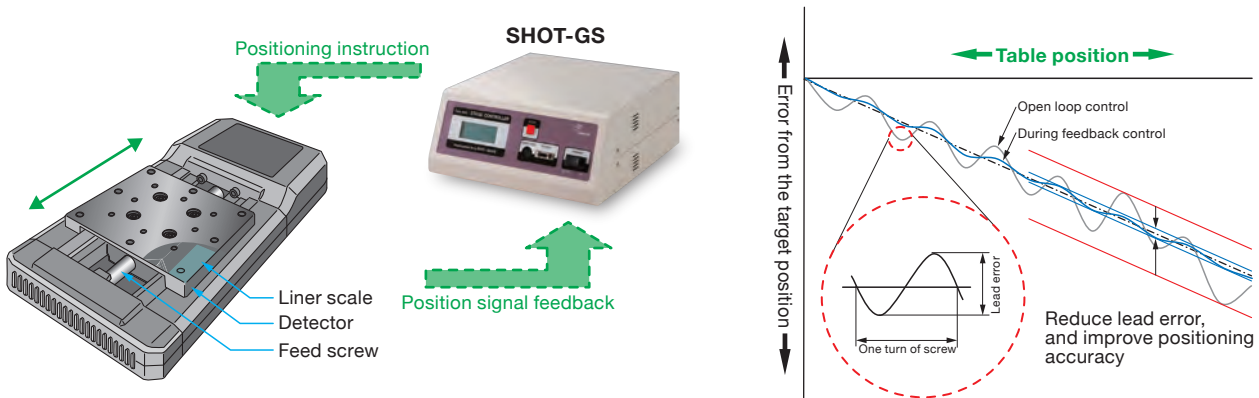
Operability Products with two axes combined offer further flexible alignment.

Lightweight Aluminum body offers lightweight.

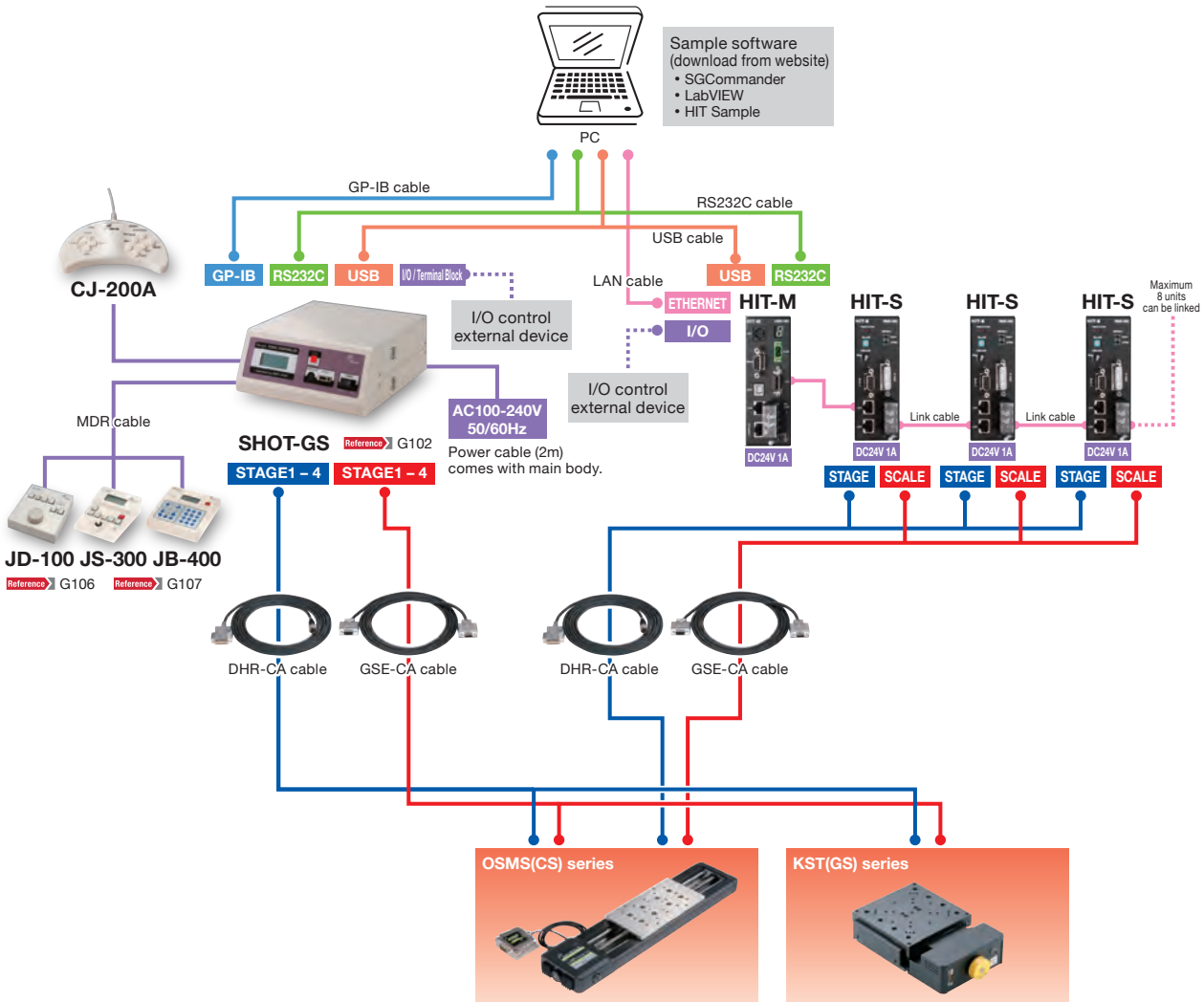
Full closed loop control system that controls a motorized stage with built-in high resolution compact linear encoder using a special controller.

- Linear encoder signal feedback and micro-step drive can minimize lead error, which is inherent to feed screw mechanism.
- Small glass scale of linear expansion coefficient enabled a highly reliable positioning system stable against fluctuations in ambient environment.
- Ideal for use in positioning that requires precision in submicron units, and prolonged driving that is affected by reproducibility by temperature drift.

Full Closed Control System (Image diagram)



System Chart



SGMV series Translation Motorized Stages - AC servo Motor



High precision/high stiffness stages driven by AC servo motor. The stage structure unifies the functions of precision linear guide and precision ball screw, places the linear guide, inner block (table) and drive ball screw at the same position, and uses high stiffness U-shape outer rail for the guide to offer small footprint with large load rating.

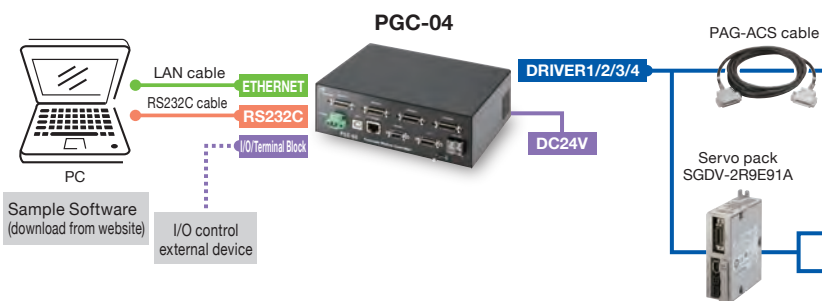
- AC servo motor stages are recommended for production equipment that runs at high speed accompanied by rapid acceleration/deceleration for reduction of takt time, because they generate sufficient torque in high-speed area and are less subject to position deviation.
- Stepping motor stages are recommended for positioning of optical systems that requires stability at rest.



Motor Type	Stepping Motor	Servo Motor
Control Method	Open loop control	Semi-closed loop control
Torque Characteristic	Torque is large in low speed and small in high-speed area	Generate the same torque throughout the low-speed area to high-speed area
Stability at Rest	Very stable under normal conditions, but cannot detect position deviation caused by external force, etc.	Deviation may occur within the range of in position, but it returns to the original position by detecting position deviation due to external force, etc. with an encoder.
Recommended Application	Applications that exert light load and require stability at rest, such as positioning and measurement in optical systems or small areas	Applications that do not allow position deviation even during high-speed operation or load fluctuation, such as production lines

- The control system has automatic tuning functions, and a stage controller system usable just by connecting with a special cable as well as servo pack that has high compatibility with the existing FA system are available.

Configuration Example Using Stage Controller

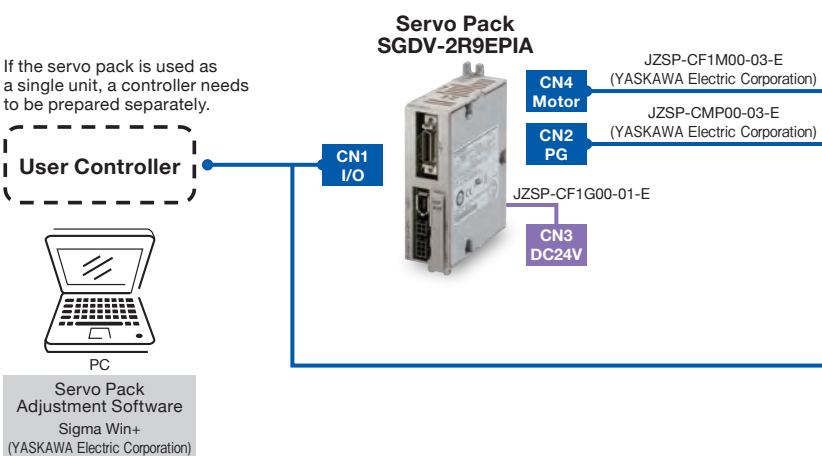


Stages driven by AC servo motor



Configuration Example Using Servo Pack

If the servo pack is used as a single unit, a controller needs to be prepared separately.



Stages driven by AC servo motor



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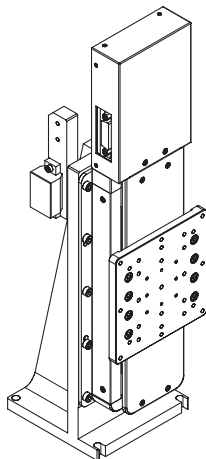
- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

Servo Pack Adjustment Software
Sigma Win+
(YASKAWA Electric Corporation)

Mounting of Electromagnetic Brake Equipped Motors

A normally closed type electromagnetic brake exerts braking force when the power is off and securely holds load. It prevents the movable table from falling to avoid sample damage.

OSMS26-100(Z)
Example of electromagnetic brake assembly dimensions



- Change stepping motors or servo motors (optional) used for Z axis motorized stages to electromagnetic brake equipped motors.

Guide

- ▶ Contact our International Sales Division for changing to electromagnetic brake. Or use the motorized stage system question sheet. [Reference](#) G111
- ▶ To drive a motorized stage, DC24V power voltage is required.

Attention

- ▶ External dimensions diagram will change because motors are changed to electromagnetic brake equipped motors.

Wiring Example

Lead wire for brake of electromagnetic brake equipped motor



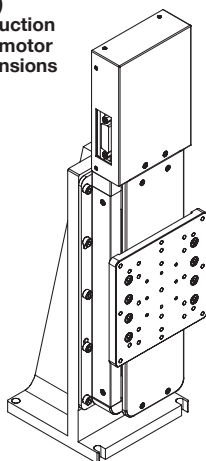
Stage controller side



Motorized stage side

Mounting of Reduction Gear Equipped Motors

OSMS26-100(Z)
Example of reduction gear equipped motor assembly dimensions



Deceleration, high torque and high resolution can be achieved by changing to reduction gear equipped motors. Effective for downsizing and weight saving of systems since it does not require power supply.

- Change 5-phase stepping motors or servo motors used for Z axis motorized stages to reduction gear equipped motors.

Guide

- ▶ Contact our International Sales Division for changing motors. Or use the motorized stage system question sheet. [Reference](#) G111

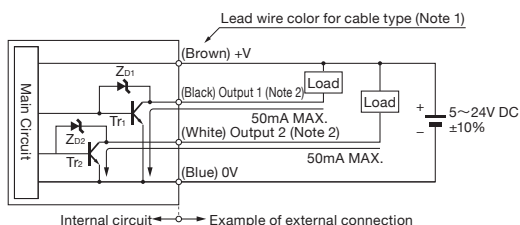
Attention

- ▶ Outline drawing may change because motors are changed with reduction gear equipped motors. The OSMS20 series are not compatible.

Limit Sensor

- Regarding the limit sensor used for motorized stages, refer to the specification of each product.
- We will change output operations or add a limit sensor on special orders.

Input/Output Circuit Diagram (NPN output type)



Output Operation

	Lead Wire Color	Output Operation
Output 1	Black	ON when light enters (NORMAL CLOSE)
Output 2	White	ON when shaded (NORMAL OPEN)

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm

Others



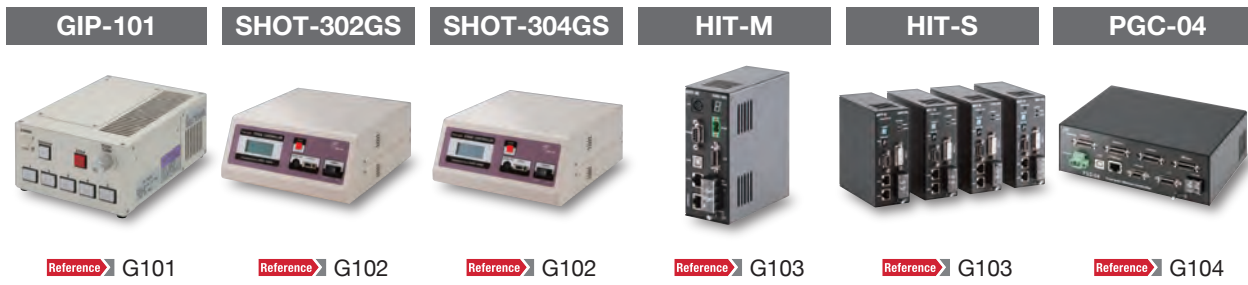
Stepping Motor Stage



Stages with built in Glass-scale Encoder

	GSC-01	GSC-02	SHOT-702
	Reference G098	Reference G099	Reference G100
Standard driver (full step/half step)	Standard driver (full step/half step)		
0.75A/phase rated motor or lower	0.75A/phase rated motor or lower		
Single axis	Single axis	1 – 2 axes	1 – 2 axes
D15RP-CA cable	D15RP-CA cable	D15RP-CA cable	D15RP-CA cable
D15RP-CA cable	D15RP-CA cable	D15RP-CA cable	D15RP-CA cable
Not compatible	Not compatible	Not compatible	D15D15A cable
Not compatible	Not compatible	Not compatible	Not compatible
Not compatible	Not compatible	Not compatible	Not compatible
Not compatible	Not compatible	Not compatible	Not compatible
Not compatible	Not compatible	Not compatible	Not compatible

Part Name		1 axis Stage Controller	2 axis Stage Controller	2 axis Stage Controller
Part Number		GSC-01	GSC-02	SHOT-702
Primary Functions	Controller Function	○	○	○
	Number of Control Axes	1	2	2
	Stored Program Control	—	△	—
	Feedback Control	—	—	—
	Circular Interpolation Control	—	—	—
	Linear Interpolation Control	—	—	—
	Driver Function	Standard	Standard	Standard
	Micro-step (Max. Division)	2	2 (half step only)	250
General Specifications	Driving Current (A/phase)	0.8	0.8	1.1
	Power Voltage	DC24V 1.2A	DC24V 2A	AC100 – 240V 50/60Hz
	Power Consumption	30VA	48VA	50VA
	External Dimensions (W×H×Dmm)	47×90×125	180×40×125	260×70×280
Interface	Weight (kg)	0.4	0.7	2.8
	GP-IB	—	—	—
	RS232C	○	○	○
	USB	—	—	—
	Ethernet	—	—	—



Micro-step driver					
	1.4A/phase rated motor or lower		0.75A/phase rated motor or lower		
Single axis	1 – 2 axes	1 – 4 axes	1 – 8 axes		4 axes
D15RP-CA cable	D15RP-CA cable	D15RP-CA cable	D15RP-CA cable		D15RP-CA cable
D15RP-CA cable	D15RP-CA cable	D15RP-CA cable	D15RP-CA cable		D15RP-CA cable
D15D15A cable	D15D15A cable	D15D15A cable	D15D15A cable		D15D15A cable
Not compatible	D15D15A cable	D15D15A cable	Not compatible		D15D15A cable
Not compatible	DHR/GSE cable	DHR/GSE cable	DHR/GSE cable		Not compatible
Not compatible	DHR/GSE cable	DHR/GSE cable	Not compatible		Not compatible

Intelligent Positioning System	2 axis Stage Controller	4 axis Stage Controller	Extensible Stage Controller (Master)	Extensible Stage Controller (Slave)	Pulus Generating Controller
GIP-101	SHOT-302GS	SHOT-304GS	HIT-M	HIT-S	PGC-04
○	○		○	–	○
1	2	4	8	–	4
–	○		○	–	○
–	Glass scale		Glass scale (except for KST(GS))		–
–	○		○	–	○
–	2 axes		3 axes	–	○
Micro-step	Micro-step		–	Micro-step	–
250	250		–	250	–
0.75	1.4		–	1.1	–
AC100–240V 50/60Hz	AC100–240V 50/60Hz		DC24V 1A		DC24V 1.4A
100VA	160VA	300VA	24VA		34VA
145×205×81	270×118×302		130×120×50		180×140×60
2.0	5.5	6.5	0.62	0.63	1.3
–	○	○	–	–	–
○	○	○	○	–	○
–	○	○	○	–	–
–	–	–	○	–	○

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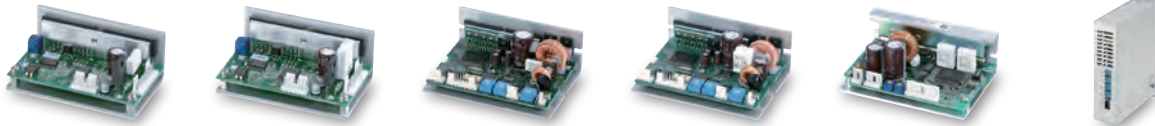
120mm

Others



Part Name	
Part Number	
Primary Functions	Driving Motor
	Drive System
	Driving Current (A/phase)
	Excitation System
	Number of Divisions
	Input Signal
	Input Logic
	Max. Response Frequency
	Auto Current Down OFF Input
Motor Excitation OFF Input	
General Specifications	Micro-step Selection Input
	Origin Excitation Timing Output
	Input Voltage
	Operating Temperature Range
	External Dimensions (W×H×Dmm)
Weight (kg)	

Stage	Motor Used	Basic Step Angle [°]	Phase Current [A/phase]	External Dimensions [W×H×Dmm] (excluding shaft)
OSMS40-5ZF SGSP-ACT series	PK513PB-C9	0.72	0.35	20×20×72
OSMS20-35 OSMS20-85 series	TS3664N4E10		0.75	24×24×31
SGSP-40/60YAW HDS-60 series	TS3664N4	0.75	0.66	24×24×31
OSMS26 OSMS60-ZF SGSP-60A/B TAMM OSMS-40/60 SGSP-80/120/160YAW HPS HDS-80/120 series	PK523HPB-C12		28×28×32	
OSMS80-20ZF	PK525HPB-C4		28×28×51.5	
OSMS33 series	A7177-90215KTG	0.036	0.75	28×28×61.3
KST-120/160YAW series	TS3667N43E967	0.72		1.4
KST-50 / KST(GS)-50 KST-100 / KST(GS)-100 KST-200 / KST(GS)-200 series	TS3624N42E967		60×60×56.5	
	PK564-NBW PK566-NBW PK569-NBW		60×60×46.5 60×60×57.5 60×60×87	



Compact Driver	Compact Driver	Compact Micro-step Driver	Compact Micro-step Driver	Micro-step Driver	Micro-step Driver
SG-5MA	SG-5M	SG-55MA	SG-55M	SG-514MSC	MC-7514PCL
5-phase stepping motor					
Bipolar constant current pentagon drive					
0.25 – 0.85	0.5 – 1.4	0.23 – 0.75	0.5 – 1.6	0.3 – 1.4	0.5 – 1.4
Full/Half step		Micro-step		Micro-step	Micro-step
Two types 1, 2		16 types 1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250		16 types 1, 2, 2.5, 5, 8, 10, 20, 25, 40, 50, 80, 100, 125, 200, 250	16 types 1, 2, 4, 5, 8, 10, 16, 20, 25, 40, 50, 80, 100, 125, 200, 250
1 clock input method 2 clock input method		1 clock input method 2 clock input method		2 clock input method	1 clock input method 2 clock input method
Photocoupler input		Photocoupler input		C-MOS equivalent negative logic input	Photocoupler input
50kpps		500kpps		500kpps	500kpps
None		None		None	Equipped
Equipped		Equipped		Equipped	Equipped
None		4 bit signal input or switching by the number of division setting switch		4 bit signal input	Switching by the number of division setting switch
None		Equipped		Equipped	Equipped
DC20 – 40V 1.5A Max	DC20 – 40V 3A Max	DC24 – 36V 1.5A Max	DC24 – 36V 3A Max	For motor drive: DC24 – 36V ±10% 2A or lower For logic: DC5V ±5% 0.1A or lower	AC100 – 230V±10% 50/60Hz 3.5A Max
0 – 40°C		0 – 40°C		0 – 40°C	0 – 40°C
77×32×45		105×38×74		91×36×70	170×130×39
0.1		0.2		0.2	0.75

○	×	○	×	○	×
○	○	○	○	○	○
○	○	○	○	○	○
○*	○	○*	○	○	○
○*	○	○*	○	○	○
○*	○	○*	○	○	○
○*	○	○*	○	○	○
×	○ * DC36V	×	○ * DC36V	○ * DC36V	○
×	○	×	○	○	○

* Can be used with 0.75A/phase.

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Softwares

Software for creating operation check or automation applications and for supporting program development are available.

Sample Softwares

SGCommander

RS232C interface stage controller control software. In addition to remote control from a PC, simple program control using Excel is possible.

LabVIEW Sample Program

Sample module for controlling stages using the graphical programming environment LabVIEW of National Instruments Corporation

Compatible with LabVIEW 5.1/6i/7.1/8.6/2010/2012

Special Application Softwares

SGTERME Reference G024 Trial Version



Terminal software for receiving and sending commands input in Excel cells. Applications can be developed flexibly using repetition and conditional branching macros, without programming knowledge.

Compatible with 32/64bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

SGEMCSE Reference G025 Trial Version



Software for positioning & measurement that automatically collects data and outputs results in Excel simply by selecting a controller and setting a measuring instrument.

Applications can be developed using the program measurement function with routine drive patterns and the Excel instruction measurement function that measures arbitrary coordinates, without programs. Compatible with 32/64bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

Software for Positioning, Measurement & Analysis

SGMACSE Trial Version



Software with enhanced functions such as real-time graphical display, analysis or correction of measurement data and RS232C binary data exchange.

Compatible with 32 bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

Automated Collimation Measurement Software

SGCAMSE Trial Version



Used in combination with the collimation checker system, this software automatically measures laser light collimation (parallelism) and judges good or bad.

Compatible with 32 bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

Software for Monitoring & Control

SGVIEWE



Software for measuring dimensions and angles based on images loaded from a USB camera connected to a PC, as well as for saving loaded images. It can measure an arbitrary point or perform simple time-lapse measurement when used in combination with a stage.

Compatible with 64 bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

Software for Liquid Crystal Evaluation System

SGLCESE



Being compatible with major color luminance meters and spectroradiometers, this software packaged luminance, chromaticity, viewing angle characteristics and other functions required for flat panel evaluation.

Compatible with 64 bit version of Windows®XP/Vista/7 * Refer to our website for the latest support status.

Library for Program Development

Component Software for VB.NET

SGNETXE



RS232C/GP-IB/USB communication library enabling control programming for stage controller with VB.NET.

Compatible with 32/64bit version of Windows®XP/Vista/7 * NET Framework1.1 or later version is required.

ActiveX for Positioning & Measurement

SGACTXE/SGPATXE/SGSFSXE

RS232C/GP-IB/USB communication library enabling control programming for stage controller with VB6.0 or VBA.

32 bit Windows®-only
* Windows®Vista/7 does not work with USB.

Guide

► Contact our International Sales Division for more information. Information is also available on [WEB](#).

Part Name	Part Number
Software for Positioning, Measurement & Analysis	SGMACSE
Automated Collimation Measurement Software	SGCAMSE
Software for Monitoring & Control	SGVIEWE
Software for Liquid Crystal Evaluation System	SGLCESE

Part Name	Part Number
Component Software for VB.NET	SGNETXE
ActiveX for Positioning & Measurement	SGACTXE
	SGPATXE
	SGSFSXE

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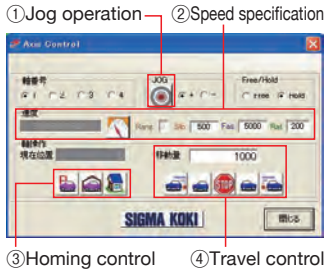
Others

Free Software | SGCommander (for RS232C) Windows® Version

(For SHOT(Mark)-102/202/204, FINE(Mark)-501/502/503, FINE-01, SHOT-302GS/304GS, PAT-001, OMEC-2BF/2BG/4BF/4BG, SHOT-602, CSG-602R/522R, MINI-5D, BS-302GS/304GS, PKA-ID-02, SHOT-702, FINE-01γ, GIP-101, GSC-01/02)

▶ WEB Reference [Home > Support > Software Information > Sample Software: SGCommander](#)

Free software is available to operate your controller easily from a PC. Each axis of a connected motorized stage can be moved using buttons on the screen. The software can be downloaded from our website.



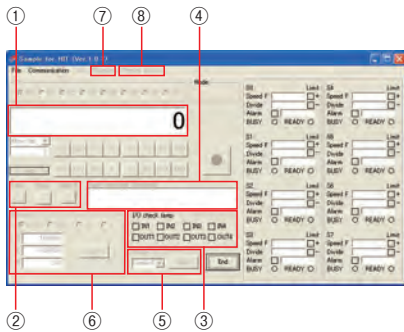
Simple operations are possible such as travel by specifying an axis (pulse instruction), homing or jog operation.



Controllers such as SHOT-30*/702 and FINE-**, which have a built-in program function, allow editing of programs from a PC. Since data can be downloaded/uploaded from/to Excel sheets, it is easy to edit programs. In addition, upload of memory switch or download mode is available.

Free Software (for HIT) | HIT sample for LAN/RS232C

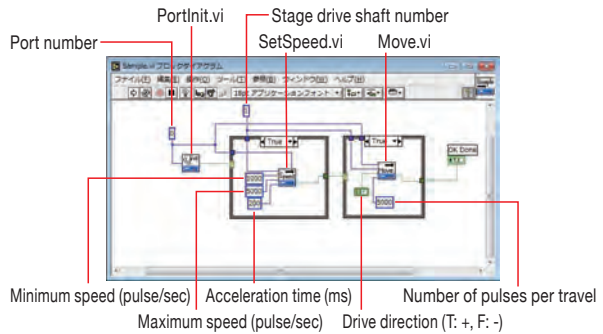
Free software is available for HIT of SGCommander.



- Functions**
- ① Relative position travel
 - ② Origin return
 - ③ IO menu
 - ④ Command input (Terminal)
 - ⑤ Number of division setting
 - ⑥ Speed change
 - ⑦ Program editing
 - ⑧ Memory switch menu

Free Application | LabVIEW (for v.5.1/v.6i/v.7.1/v.8.6/v.2010/v.2012) RS232C/GP-IB

LabVIEW application is available for LabVIEW users.



Other: 30 Day Trial Version | SGEMCSE / SGTERM

SGEMCSE.....SGEMCSE is software for collecting data or measuring using automatic positioning equipment, measuring instrument or controller, and is offered 30 days for free.
SGTERM E.....It allows command input using Excel for easy program making. SGTERM E is ideal software to link with various devices, and is offered 30 days for free.



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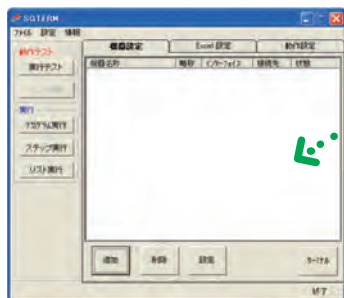
Part Number	SGTERME
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General-purpose communication terminal software that uses Excel.

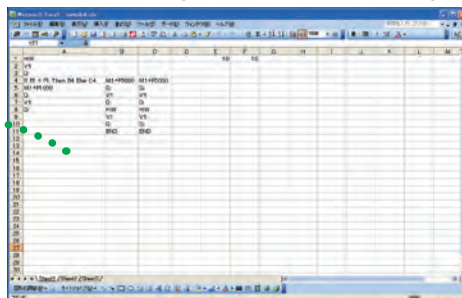
- Positioning and measurement can be performed just by listing and executing commands in an Excel sheet.
- Continuous process or step-by-step process can be selected.
- Use of SGTERM's original control scripts, "If", "Jump", "Loop" and "Print" in an Excel worksheet simplifies processing control.
- Since measurement results are output to an Excel sheet, easy to analyze and manage measured data.
- Set content can be saved as a "*.SGE" file, which facilitates setting of the same process again.
- RS232C^{*1}/GP-IB^{*2}/USB^{*3} interfaces are supported.
- Compatible with Windows[®]XP/Vista/7^{*4}.

^{*1} RS-232C ports are available from COM1 to COM8.
^{*2} As for GP-IB, only GP-IB of National Instruments Corporation is supported.
^{*3} USB is only supported for SHOT-302/304 series, HIT-M, FINE-01y/503 series, and OMEC-2BG/4BG series.
^{*4} Conditions when used with Windows[®] are as follows.
 • Administrative right is required for installation as well as execution.
 • 32/64 bit versions are supported. Check on our website for the latest support status.

SGTERME



Processing with Excel makes editing of collected data easy

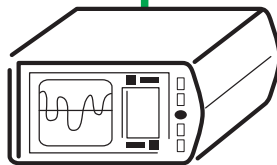


PC

Give measurement instructions or collect data using Excel

Condition setting
Measurement display
Data collection

Control display
Result acquisition

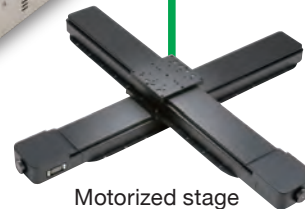


Measuring instrument



Stage controller

Reference G018 - G019

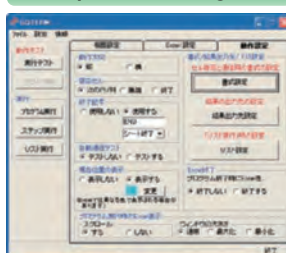


Motorized stage

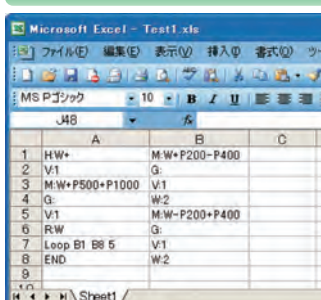
Register a device



Operation settings



Create an instruction file with Excel



- Run commands written in cells in order.
- Perform repetition or conditional branching using control scripts.
- Cell functions and VBA can also be used in combination.

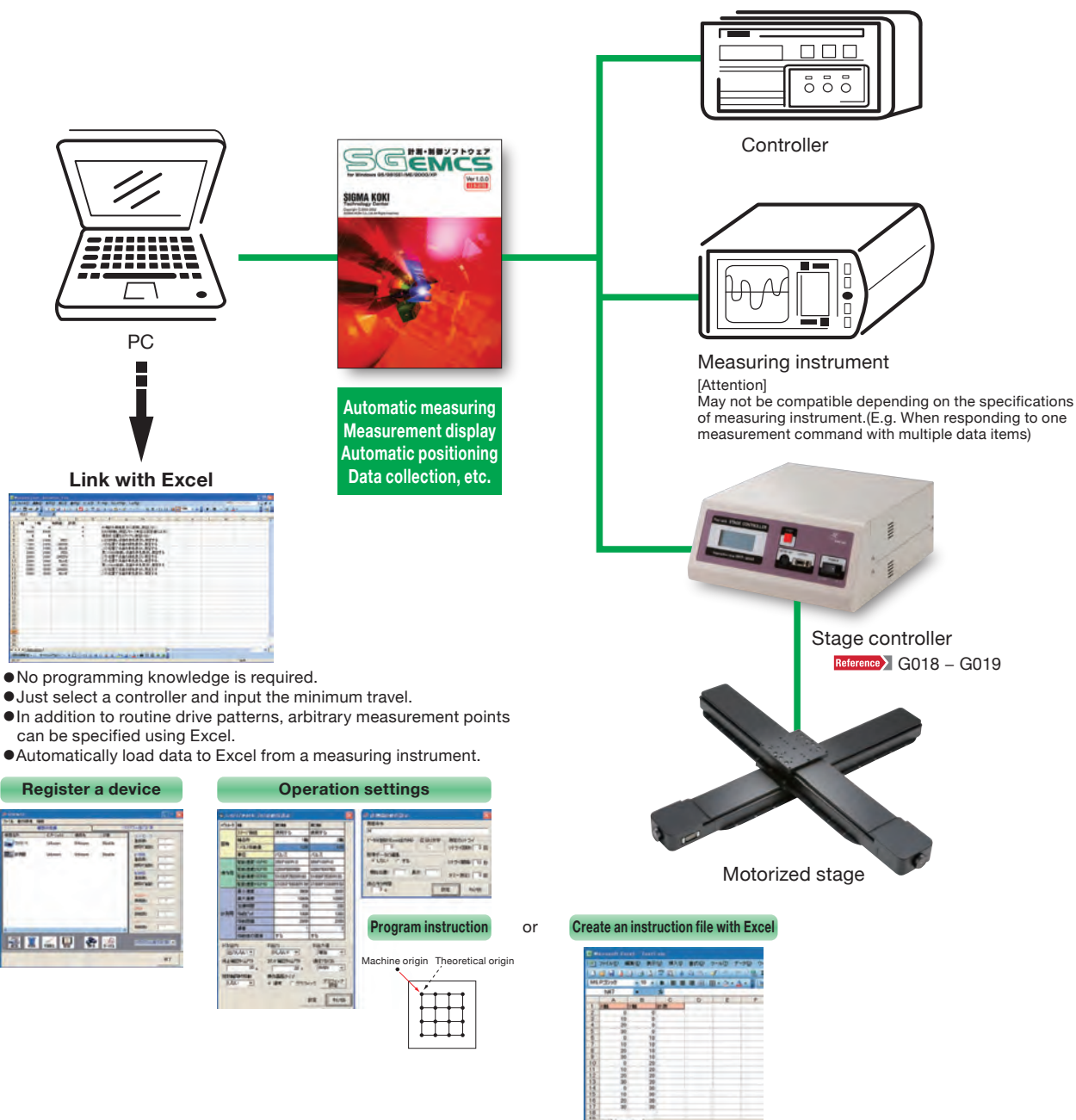


Part Number **SGEMCSE**

Positioning and measurement software highly compatible with motorized positioning devices offered by Sigma Koki.

- Multiple repetition of positioning/measurement sequence is easily realized.
- Various functions are available such as manual or time-series measurement and count presetting.
- By creating Excel instruction files, both stage control and measurement with a measuring instrument can be performed simultaneously.
- Since measurement results are output to an Excel sheet, easy to analyze and manage measured data.
- Set content can be saved as a “.SGS” file, which facilitates setting of the same process again.
- Using this software in combination with motorized positioning devices offered by Sigma Koki, a positioning and measurement system can be easily configured.
- RS232C*1/GP-IB*2/USB*3 interfaces are supported.
- Compatible with Windows®XP/Vista/7*4.

*1 RS-232C ports are available from COM1 to COM8.
 *2 As for GP-IB, only GP-IB of National Instruments Corporation is supported.
 *3 USB is only supported for SHOT-302/304 series, HIT-M, FINE-01y/503 series, and OMEC-2BG/4BG series.
 *4 Conditions when used with Windows®7 are as follows.
 • Administrative right is required for installation as well as execution.
 • 32/64 bit versions are supported. Check on our website for the latest support status.



- No programming knowledge is required.
- Just select a controller and input the minimum travel.
- In addition to routine drive patterns, arbitrary measurement points can be specified using Excel.
- Automatically load data to Excel from a measuring instrument.

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85mm

100mm

120mm

Others

Motorized Stage/Controller/Cable Sets

These sets are offered at value prices. These sets are easy to operate. Enjoy them as soon as they arrive.

X axis Set | HPS60-20X-SET



This set enables easy automatic positioning in one straight direction and JOG operation.

- Stage size : 60mm×60mm
- Travel : 20mm
- Load Capacity: 49N [5kgf]
- Cable length : 3m

Products Name	Part Number	Quantity	Reference
High Performance Motorized Stages	HPS60-20X-M5	1	G028
Single axis Stage Controller	GSC-01	1	G098
AC Adapter	PAT-001-POW1	1	—
D15RP Cable	D15RP-CA-3	1	G108

XY axis Set | SetHPS120-60XY-SET



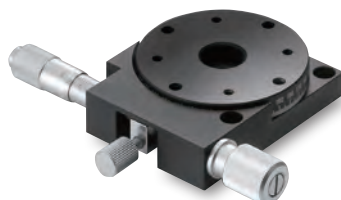
This set enables XY axis automatic alignment, and program operation without using a PC.

- Stage size : 120mm×120mm
- Travel : 60mm
- Load Capacity: 88.2 [9kgf]
- Cable length : 3m

Products Name	Part Number	Quantity	Reference
High Performance Motorized Stages	HPS120-60X-M5	2	G028
2 axis Stage Controller	GSC-02	1	G099
Joystick Terminal	SJT-02	1	G106
AC Adapter	PAT-001-POW1	1	—
D15RP Cable	D15RP-CA-3	2	G108

For easier positioning ... Manual stages which can be used in combination.

■ θ axis Rotation Stages
KSP-606M



Reference E144

■ Z axis Steel Extended Contact Slide Stages
TSD-603



Reference E086

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Others

Xyθ axis Set | HPS/HDS120-XYθ-SET



Motorized stage system for minute positioning and angle adjustment such as for marking of semiconductor wafers.

- It can be controlled externally using Ethernet/RS232C/USB interface. Also, the number of axes is extendable by adding slave controllers (Part Number: HIT-S).
- Stage size : $\phi 120\text{mm}$
- Travel : $\pm 6^\circ$ [θ axis]
: 60mm [XY axis]
- Load Capacity : 58.8N [6kgf]
- Cable length : 3m

Products Name	Part Number	Part Number	Reference
High Performance Motorized Stages	HPS120-60X-M5	2	G028
High durability automatic rotation stage	HDS-120YAW	1	G080
Extensible Stage Controller (Master)	HIT-M	1	G103
Extensible Stage Controller (Slave)	HIT-S	3	G103
AC Adapter		1	—
D15RP Cable	D15RP-CA-3	3	G108

XYZ axis Set | OSMS20-XYZ-SET



This set is best suited for measuring and inspection equipment and for XYZ axis automatic positioning of workpieces.

- It can be controlled externally using RS232C/GP-IB/USB interface, or manually using a joy stick (JS-300).
- Stage size : 60mmx60mm
- Travel : 85mm [XY axis], 10mm [Z axis]
- Load Capacity : 29.4N [3kgf]
- Cable length : 3m

Products Name	Part Number	Part Number	Reference
OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor	OSMS20-85(X)	2	G032
Translation Motorized Stages, Flat Z axis - 5 Phase Stepping Motor	OSMS60-10ZF	1	G070
4 axis Stage Controllers	SHOT-304GS	1	G102
Joystick Terminal	JS-300	1	G107
D15RP Cable	D15RP-CA-3	1	G108
D15D15A Cable	D15D15A-CA-3	2	G108
MDR14-CA-2.5 Cable	MDR14-CA-2.5	1	G109

Make it more convenient ... Software for stage control

■ Software for Positioning, Measurement & Analysis
SGMACSE



Reference G022

■ Software for Monitoring & Control
SGVIEWE



Reference G022

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40mm

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80mm

85mm

100mm

120mm

Others

High Performance Motorized Stages | HPS

RoHS

Motorized stages with ball screws offering middle/high performance at low price.



- Ball screws with improved durability compared to the existing TSDM series.
- Our original high precision integrated ball guide used in place of a cross roller guide makes it possible to offer a price lower than the TAMM series.

Guide

- ▶ Please contact us when assembled into XYZ axis or use in reversion on the ceiling or vertical direction.
- ▶ Opposite model or various motor changes are optionally available.
[Reference](#) G030

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60mm

80mm

85mm

100mm

120mm

Others

Specifications

Part Number		HPS60-20X-M5	HPS80-50X-M5	HPS120-60X-M5	
Mechanical Specifications	Travel [mm]	20	50	60	
	Table Size [mm]	60×60	80×80	120×120	
	Feed Screw	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	
	Positioning Slide	Ball guide	Ball guide	Ball guide	
	Stage Material	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	
	Weight [kg]	0.6	1	1.5	
Resolution	(Full) [μm/pulse]	2	2	2	
	(Half) [μm/pulse]	1	1	1	
Accuracy Specifications	MAX Speed [mm/sec]	10	10	10	
	Positioning Accuracy [μm]	15	25	25	
	Positional Repeatability [μm]	±1	±2	±2	
	Load Capacity [N]	49 (5kgf)	73.5 (7.5kgf)	98 (10kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.4	0.5	0.5
		Yaw [°/N·cm]	0.4	0.5	0.5
		Roll [°/N·cm]	0.3	0.2	0.2
	Lost Motion [μm]	1	2	2	
	Backlash [μm]	1	2	2	
	Parallelism [μm]	30	40	50	
Running Parallelism [μm]	10	10	10		
Pitch [°] / Yaw [°]	25/25	30/25	30/25		
Sensor	Sensor Part Number	Micro photo sensor: GP1S097HCZ(Sharp Corporation)			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK523HPB-C12 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V ±10%
	Current Consumption	60mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA When load current is 16mA, the residual voltage is under 0.4V When load current is 50mA, the residual voltage is under 0.7V
	Output Logic	In the case of light shielded ,output transistor OFF (No conduction): Limit sensor In the case of light shielded ,output transistor ON (Conduction): Origin sensor

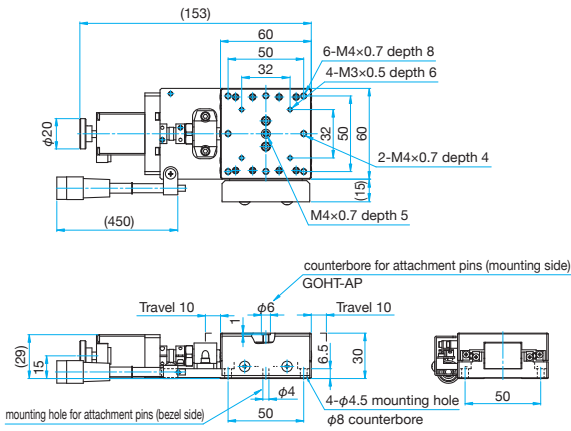
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514M5C, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

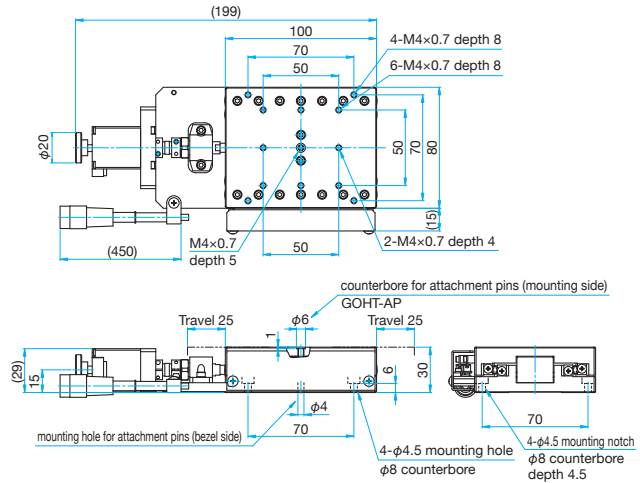


Outline Drawing

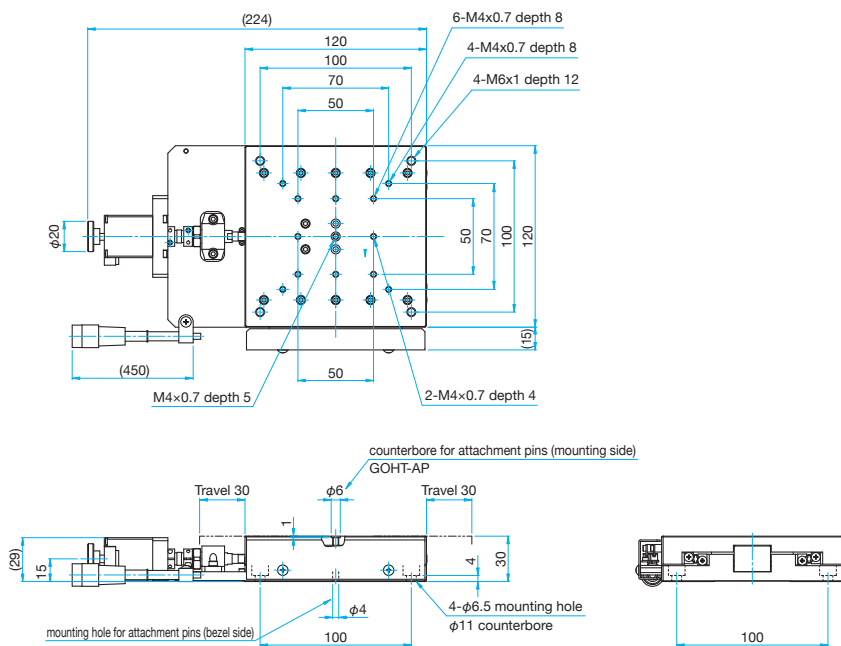
HPS60-20X-M5 Hexagon socket head cap screw M4×12...4 screws



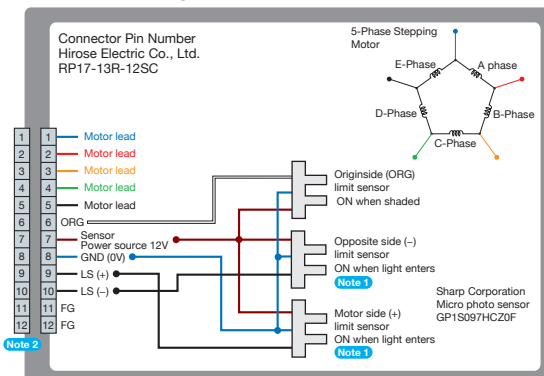
HPS80-50X-M5 Hexagon socket head cap screw M4×12...4 screws



HPS120-60X-M5 Hexagon socket head cap screw M4×12...4 screws

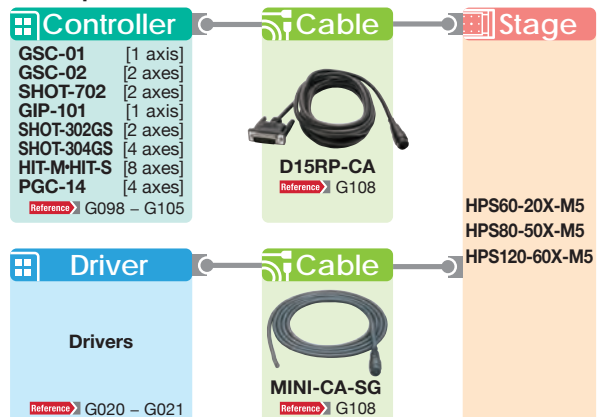


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with proximity origin sensors.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

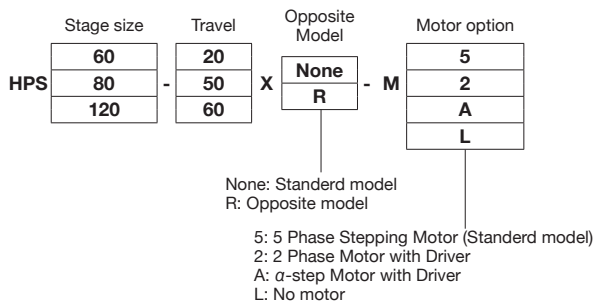
□ 120mm

Others

High Performance Motorized Stage Options | HPS Option

Specification Method of Option Code

Option Code



Example of Code Specification

HPS60-20X□-M□

Features of Options

2 Phase Motor with Driver	It can reduce the total cost because a driver is equipped. On the other hand, precision is inferior to 5 phase motors.
α Stepping Motor with Driver	Can be replaced with an α stepping motor with driver which can move fast. The motor also has built-in encoder.
No Motor	No Motor Provide a stage without motor because the customer mounts own motor. Note that mounting and adjustment of a motor requires specialized skills.



HPS120-60X-MA

Guide

- ▶ Please contact us when assembled into XYZ axis or use in reversion on the ceiling or vertical direction.
- ▶ Replacement with electromagnetic brakes or grease change is also available. Contact our International Sales Division for more information.

Specifications (ex. HPS60-20X)

Part Number		HPS60-20X-M2	HPS60-20X-MA	HPS60-20X-ML	
Mechanical Specifications	Travel [mm]	20	20	20	
	Table Size [mm]	60×60	60×60	60×60	
	Feed Screw	Ball screw diameter ϕ 6mm, 1mm lead	Ball screw diameter ϕ 6mm, 1mm lead	Ball screw diameter ϕ 6mm, 1mm lead	
	Positioning Slide	Ball guide	Ball guide	Ball guide	
	Stage Material	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	
	Weight [kg]	0.6	1	0.6	
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	5	2 (500P/R)	—
		(Half) [μ m/pulse]	2.5	1 (1000P/R)	—
	MAX Speed [mm/sec]	20	40	—	
	Positioning Accuracy [μ m]	15	15	—	
	Positional Repeatability [μ m]	\pm 2	\pm 0.5	—	
	Load Capacity [N]	49 (5kgf)	49 (5kgf)	49 (5kgf)	
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.4	0.4	0.4
		Yaw [$^{\circ}$ /N·cm]	0.4	0.4	0.4
		Roll [$^{\circ}$ /N·cm]	0.3	0.3	0.3
	Lost Motion [μ m]	1	1	—	
	Backlash [μ m]	1	1	1	
	Parallelism [μ m]	30	30	30	
	Running Parallelism [μ m]	10	10	10	
Pitch [$^{\circ}$] / Yaw [$^{\circ}$]	25/25	25/25	25-25		
Sensor	Sensor Part Number	Micro photo sensor: GP1S097HCZ (Sharp Corporation)	Micro photo sensor: GP1S097HCZ (Sharp Corporation)	Micro photo sensor: GP1S097HCZ (Sharp Corporation)	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

	Type	2-phase stepping motor (Oriental Motor Co., Ltd.)	α STEP motor (Oriental Motor Co., Ltd.)	(No motor)
Motor	Motor Part Number	PKP223D15B (□28mm)	ARM26SBK (□28mm)	—
	Step Angle	1.8 $^{\circ}$	0.72 $^{\circ}$ (500P/R)	—
	Driver	Part Number	A8576-0415Y	ARD-K
Sensor	Power input	DC24V \pm 10% 1A	DC24V \pm 10% 0.9A	—
	Power Voltage	DC5 - 24V \pm 10%		
	Current Consumption	60mA or lower (20mA or lower per sensor) A8576-0415Y		
	Control Output	DC24V \pm 10% 1A		
Output Logic	NPN open collector output DC30V or lower, 50mA When load current is 16mA, the residual voltage is under 0.4V When load current is 50mA, the residual voltage is under 0.7V In the case of light shielded ,output transistor OFF (No conduction): Limit sensor			

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□40mm

□60mm

□80mm

□85mm

□100mm

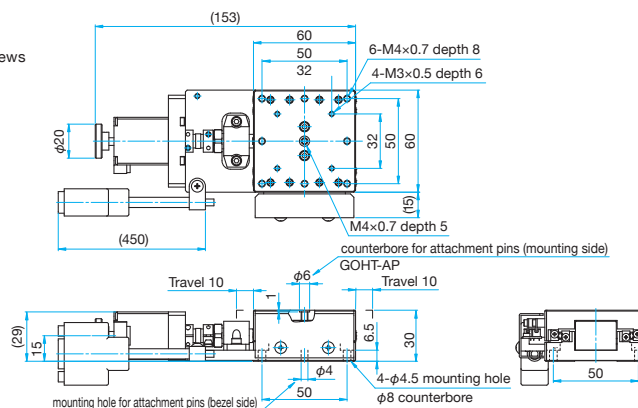
□120mm

Others

Outline Drawing

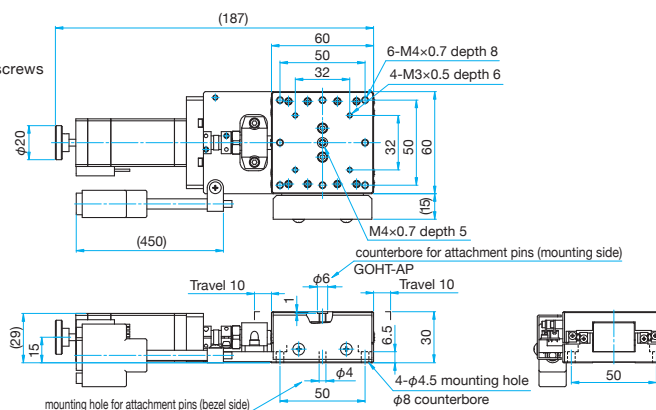
HPS60-20X-M2

Hexagon socket head cap screw M4x8...6 screws



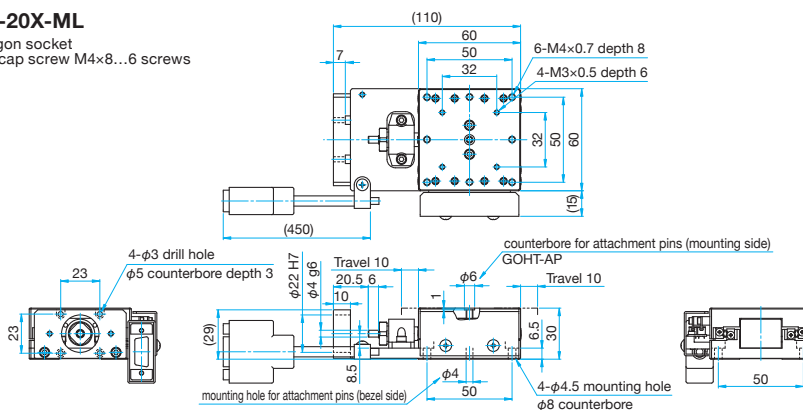
HPS60-20X-MA

Hexagon socket head cap screw M4x8...6 screws

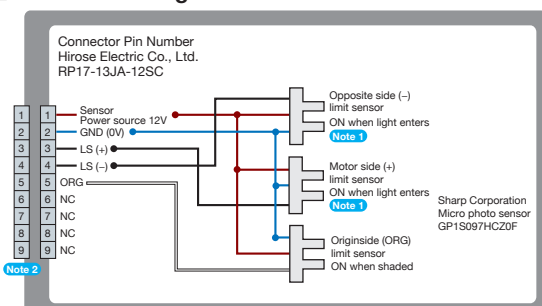


HPS60-20X-ML

Hexagon socket head cap screw M4x8...6 screws



Connection Diagram



Note 1 The motor side limit sensor is the (+) forward direction limit sensor. There is no origin proximity sensor for this motorized stage.

Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

(Reference) Motor Comparison Table

Section	5 Phase Stepping Motor	2 Phase Stepping Motor	σSTEP Motor
Positioning Accuracy	○	○	◎
Minute Feed Accuracy	○	○	○
Speed Stability	○	△	◎
Heat Generation (Continuous Operation)	○	△	◎
Max. Speed	○	○	◎
Rising Responsiveness	○	○	◎

*Rough guide for when the motors are mounted on our motorized stage. (◎ : goodness ○ : standard △ : inferior)

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS20-(X) Stage size □85mm



Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
Reference G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS20-35(X)	OSMS20-85(X)	
Part Number (-M6)		OSMS20-35(X)-M6	OSMS20-85(X)-M6	
Part Number (-INCH)		OSMS20-35(X)-INCH	OSMS20-85(X)-INCH	
Mechanical Specifications	Travel [mm]	35	85	
	Table Size [mm]	85×85	85×85	
	Feed Screw	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	1.1	1.3	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	2	2
		(Half) [μm/pulse]	1	1
	MAX Speed [mm/sec]	25	25	
	Positioning Accuracy [μm]	5	10	
	Positional Repeatability [μm]	3	3	
	Load Capacity [N]	78.4 (8.0kgf)	78.4 (8.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.4	0.4
		Yaw [°/N·cm]	0.25	0.25
		Roll [°/N·cm]	0.35	0.35
	Lost Motion [μm]	3	3	
	Backlash [μm]	3	3	
	Parallelism [μm]	30	30	
	Running Parallelism [μm]	10	10	
Pitch [°] / Yaw [°]	30/20	30/20		
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF(Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	None	Equipped	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3664N4E10 (□24mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	60mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

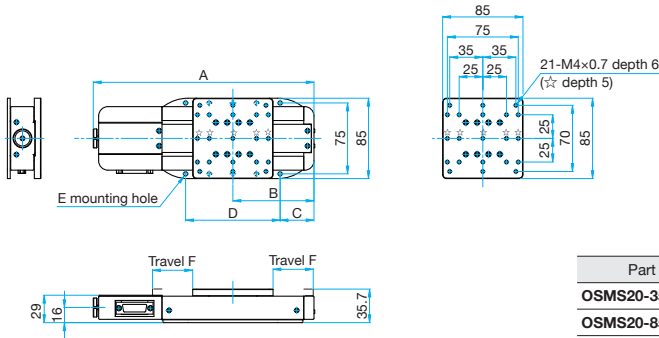
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04



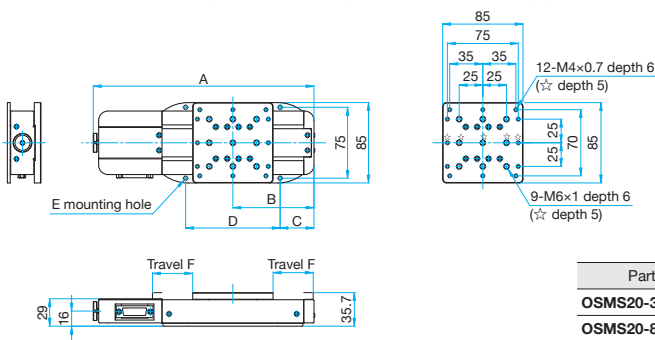
Outline Drawing

OSMS20-*(X) Hexagon socket head cap screw M4x8...8 screws (35)
Hexagon socket head cap screw M4x8...10 screws (85)



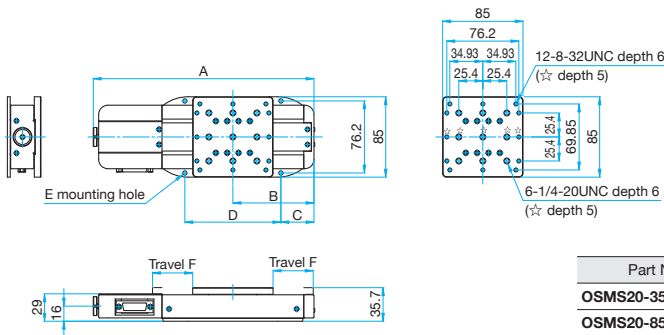
Part Number	A	B	C	D	E	F
OSMS20-35(X)	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS20-85(X)	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS20-*(X)-M6 Hexagon socket head cap screw M4x8...8 screws (35)
Hexagon socket head cap screw M4x8...10 screws (85)



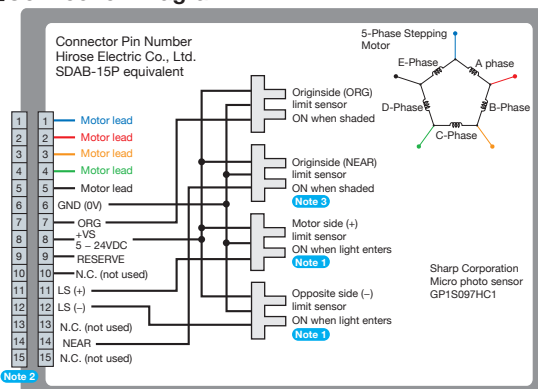
Part Number	A	B	C	D	E	F
OSMS20-35(X)-M6	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS20-85(X)-M6	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS20-*(X)-INCH Hexagon socket head cap screw 8 / 32UNCx5 / 16...8 screws (35)
Hexagon socket head cap screw 8 / 32UNCx5 / 16...10 screws (85)



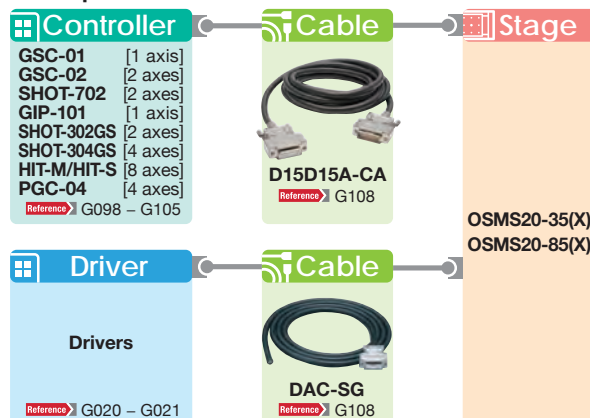
Part Number	A	B	C	D	E	F
OSMS20-35(X)-INCH	183.5	60.8	34.5	76.2(25.4x3)	8-φ4.5	17.5
OSMS20-85(X)-INCH	233.5	85.8	35	101.6(25.4x4)	10-φ4.5	42.5

Connection Diagram



- Note 1** The motor side limit sensor is the + direction limit sensor.
- Note 2** Compatible cable connector: DDK Ltd. 17JE-13150
- Note 3** OSMS20-35 is not fitted with proximity origin sensor. 13 and 14P are short-circuited

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor | OSMS20-(XY) Stage size □85mm



Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
[Reference](#) G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. [Reference](#) G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS20-35(XY)	OSMS20-85(XY)
Part Number (-M6)		OSMS20-35(XY)-M6	OSMS20-85(XY)-M6
Part Number (-INCH)		OSMS20-35(XY)-INCH	OSMS20-85(XY)-INCH
Mechanical Specifications	Travel [mm]	35	85
	Table Size [mm]	85×85	85×85
	Feed Screw	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead
	Positioning Slide	Outer rail structure	Outer rail structure
	Stage Material	Aluminum	Aluminum
	Finish	Black anodized	Black anodized
	Weight [kg]	2.2	2.6
Accuracy Specifications	Resolution	(Full) [μm/pulse]	2
		(Half) [μm/pulse]	1
	MAX Speed [mm/sec]	25	25
	Load Capacity [N]	68.6(7.0kgf)	68.6(7.0kgf)
	Backlash [μm]	3	3
	Orthogonality of Motion [μm]	5	5
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF(Sharp Corporation)	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor	Equipped	Equipped
	Proximity Origin Sensor	None	Equipped

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)	
	Motor Part Number	TS3664N4E10 (□24mm)	
	Step Angle	0.72°	
Sensor	Power Voltage	DC5 - 24V±10%	
	Current Consumption	60mA or lower (20mA or lower per sensor)	
	Control Output	NPN open collector output DC30V or lower, 50mA or lower	
	Output Logic	When shaded: Output transistor OFF (no conduction)	

(Reference) Precision Specifications of Single Axis Stage

Part Number		OSMS20-35(X)	OSMS20-85(X)	
Accuracy Specifications	Positioning Accuracy [μm]	5	7	
	Positional Repeatability [μm]	3	3	
	Moment Stiffness	Pitch [°/N·cm]	0.4	0.4
		Yaw [°/N·cm]	0.25	0.25
		Roll [°/N·cm]	0.35	0.35
	Lost Motion [μm]	3	3	
	Parallelism [μm]	30	30	
Running Parallelism [μm]	10	10		

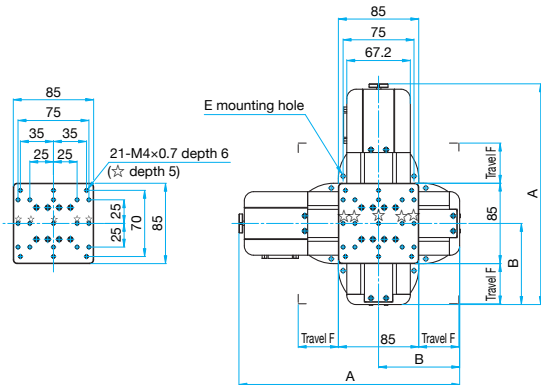
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04



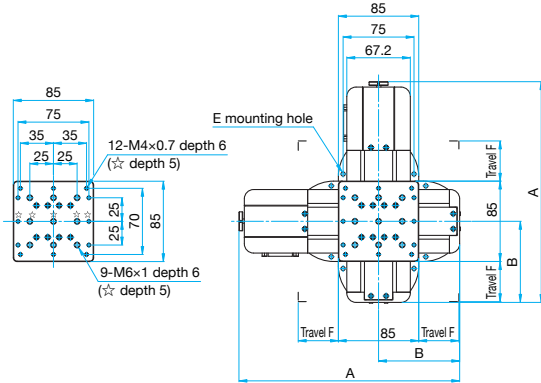
Outline Drawing

OSMS20-*(XY) Hexagon socket head cap screw M3x6...4 screws



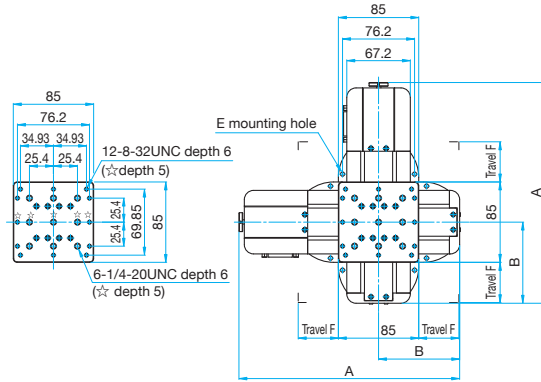
Part Number	A	B	C	D	E	F
OSMS20-35(XY)	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS20-85(XY)	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS20-*(XY)-M6 Hexagon socket head cap screw M3x6...4 screws



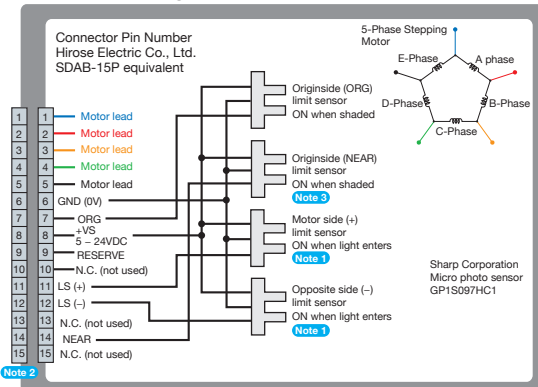
Part Number	A	B	C	D	E	F
OSMS20-35(XY)-M6	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS20-85(XY)-M6	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS20-*(XY)-INCH Hexagon socket head cap screw M3x6...4 screws



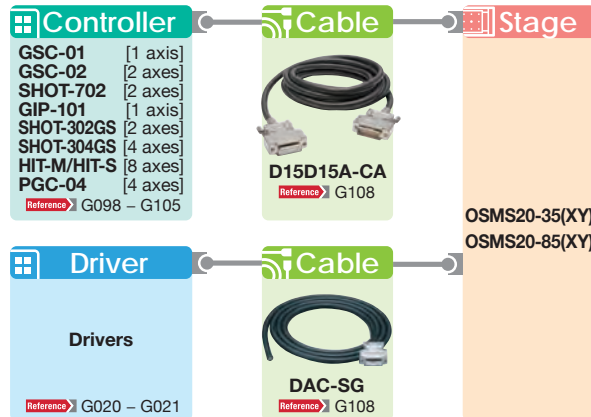
Part Number	A	B	C	D	E	F
OSMS20-35(XY)-INCH	183.5	60.8	34.5	76.2(25.4x3)	8-φ4.5	17.5
OSMS20-85(XY)-INCH	233.5	85.8	35	101.6(25.4x4)	10-φ4.5	42.5

Connection Diagram



- Note 1** The motor side limit sensor is the + direction limit sensor.
- Note 2** Compatible cable connector: DDK Ltd. 17JE-13150
- Note 3** OSMS20-35 is not fitted with proximity origin sensor. 13 and 14P are short-circuited

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor | OSMS20-(Z) Stage size □85mm

RoHS

CE

Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
[Reference](#) G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. [Reference](#) G110

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS20-35(Z)	OSMS20-85(Z)	
Part Number (-M6)		OSMS20-35(Z)-M6	OSMS20-85(Z)-M6	
Part Number (-INCH)		OSMS20-35(Z)-INCH	OSMS20-85(Z)-INCH	
Mechanical Specifications	Travel [mm]	35	85	
	Table Size [mm]	85×85	85×85	
	Feed Screw	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	2.3	2.5	
	Accuracy Specifications	Resolution	(Full) [μm/pulse]	2
(Half) [μm/pulse]			1	1
MAX Speed [mm/sec]		5	5	
Positioning Accuracy [μm]		10	20	
Positional Repeatability [μm]		3	5	
Load Capacity [N]		29.4 (3.0kgf)*1	29.4 (3.0kgf)*1	
Moment Stiffness		Pitch [°/N·cm]	0.8	0.8
		Yaw [°/N·cm]	0.5	0.5
		Roll [°/N·cm]	0.7	0.7
Lost Motion [μm]		3	3	
Backlash [μm]		3	3	
Orthogonality of Motion [μm]		25	30	
Pitch [°] / Yaw [°]		45/20	45/20	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	None	Equipped	

*1 If you use the controller of ②.

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3664N4E10(□24mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	60mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

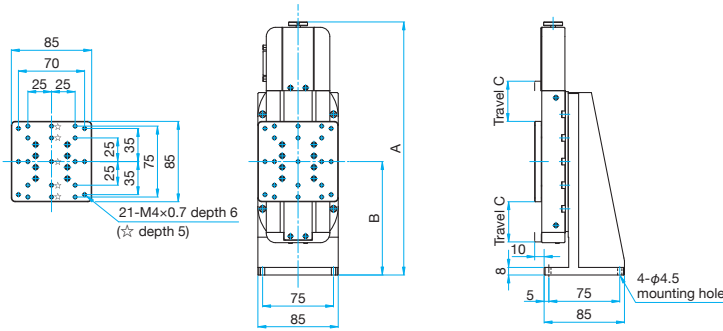
Compatible Driver / Controller

Control System	Compatible Driver	①: SG-5M, SG-5MA ②: SG-55M, SG-55MA, SG-514MSC, SG-5151, KR-525M, MC-7514PCL
	Compatible Controller	①: GSC-01, GSC-02 ②: SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04



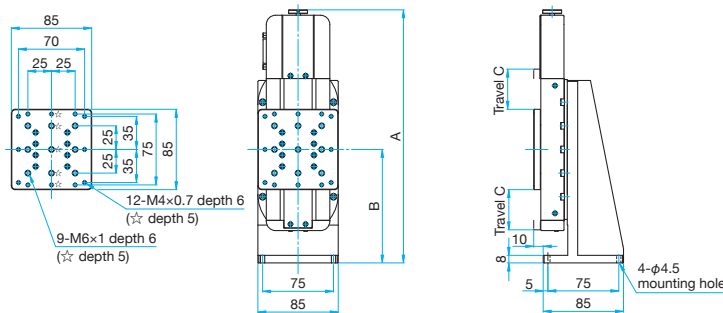
Outline Drawing

OSMS20-*(Z) Hexagon socket head cap screw M4x8...4 screws



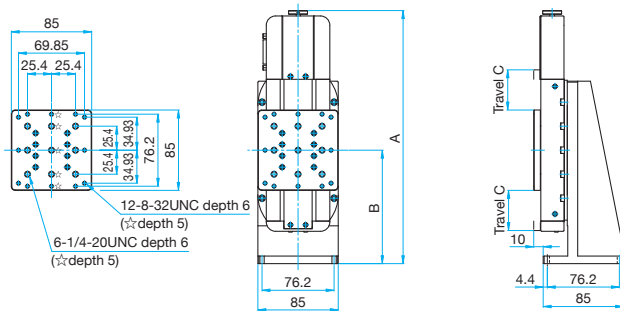
Part Number	A	B	C
OSMS20-35(Z)	217.7	95	17.5
OSMS20-85(Z)	267.7	120	42.5

OSMS20-*(Z)-M6 Hexagon socket head cap screw M4x8...4 screws



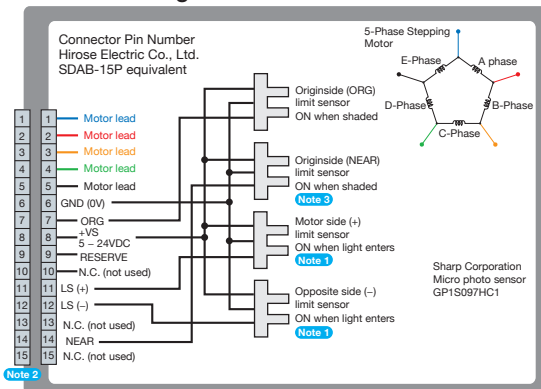
Part Number	A	B	C
OSMS20-35(Z)-M6	217.7	95	17.5
OSMS20-85(Z)-M6	267.7	120	42.5

OSMS20-*(Z)-INCH Hexagon socket head cap screw M4x8...4 screws



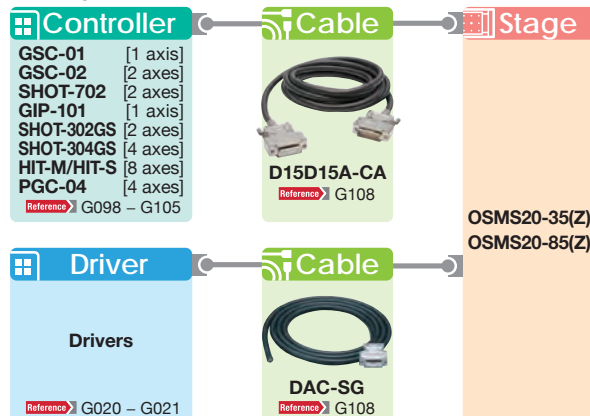
Part Number	A	B	C
OSMS20-35(Z)-INCH	216.4	94.6	17.5
OSMS20-85(Z)-INCH	267.7	120	42.5

Connection Diagram



- Note 1** The motor side limit sensor is the + direction limit sensor.
- Note 2** Compatible cable connector: DDK Ltd. 17JE-13150
- Note 3** OSMS20-35 is not fitted with proximity origin sensor. 13 and 14P are short-circuited

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Precision Motorized Stages with Built-in Compact Scale

OSMS(CS)20-(X) Stage size □85mm

RoHS

CE

The dedicated stage controllers (SHOT-302GS/304GS, HIT series) offer a full closed loop system with high precision and high reliability.



- The stages enable high stiffness and high precision positioning because their structure, which is strong against momentum and combined load, is less susceptible to pitching, rolling and yawing.
- A compact scale is built in, but the installation space is the same as that of other OSMS series when the travel is the same.

Guide

- ▶ Contact our International Sales Division for replacement of motors or for stabilizing (drop-preventing) mechanism.
[Reference](#) ▶ G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. [Reference](#) ▶ G110
- ▶ Contact our International Sales Division to use the stage as an XY axis or a Z axis stage.

Specifications

Part Number		OSMS(CS)20-35(X)	OSMS(CS)20-85(X)	
Part Number (-M6)		OSMS(CS)20-35(X)-M6	OSMS(CS)20-85(X)-M6	
Part Number (-INCH)		OSMS(CS)20-35(X)-INCH	OSMS(CS)20-85(X)-INCH	
Mechanical Specifications	Travel [mm]	35	85	
	Table Size [mm]	85×85	85×85	
	Feed Screw	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	1.4	1.6	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	2	2
		(Half) [μm/pulse]	1	1
	MAX Speed [mm/sec]	25	25	
	Positioning Accuracy [μm]	5	10	
	Positional Repeatability [μm]	2	2	
	Load Capacity [N]	78.4 (8.0kgf)	78.4 (8.0kgf)	
	Moment Stiffness	Pitch ["/N·cm]	0.4	0.4
		Yaw ["/N·cm]	0.25	0.25
		Roll ["/N·cm]	0.35	0.35
	Lost Motion [μm]	3	3	
Backlash [μm]	3	3		
Parallelism [μm]	30	30		
Running Parallelism [μm]	10	10		
Pitch ["/] / Yaw ["/]	30/20	30/20		
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	None	Equipped	
Scale head	Resolution [μm]	0.5	0.5	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3664N4E10 (□24mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	60mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)
Scale head	Power Voltage / Current Consumption	DC5V±5% / 50mA

Compatible Cable

Cable	Driver Cable	D15D15A-CA
	Scale Cable	GSEF-CA-3

Compatible Driver / Controller

Control System	Compatible Driver	—
	Compatible Controller	SHOT-302GS, SHOT-304GS, HIT-M-HIT-S

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□40mm

□60mm

□80mm

□85mm

□100mm

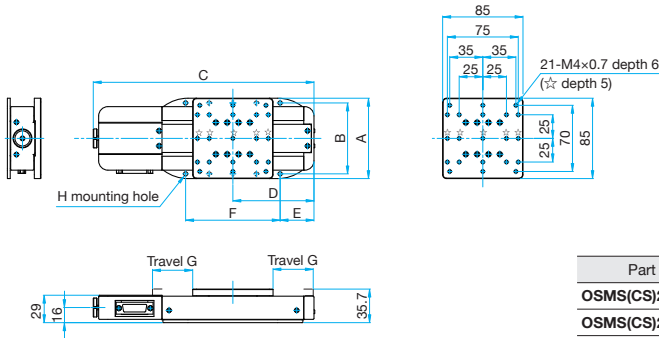
□120mm

Others



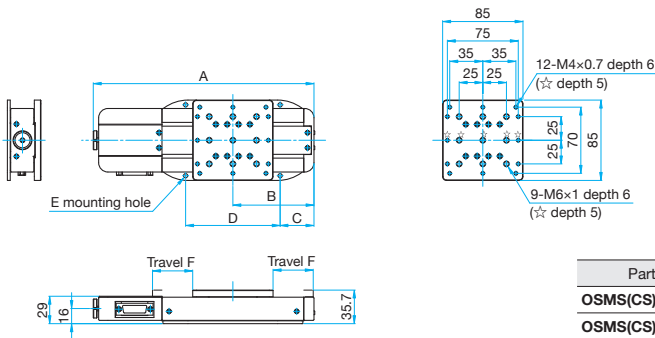
Outline Drawing

OSMS(CS)20--*(X)** Hexagon socket head cap screw M3x6...4 screws



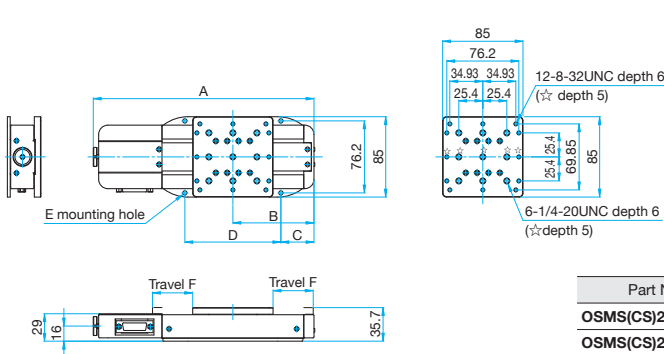
Part Number	A	B	C	D	E	F
OSMS(CS)20-35(X)	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS(CS)20-85(X)	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS(CS)20--*(X)-M6** Hexagon socket head cap screw M3x6...4 screws



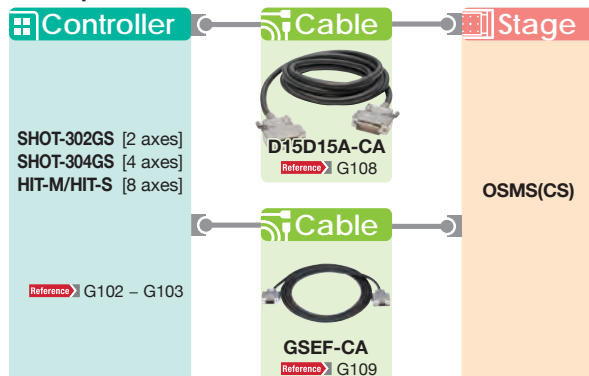
Part Number	A	B	C	D	E	F
OSMS(CS)20-35(X)-M6	183.5	60.8	35.8	75 (25x3)	8-φ4.5	17.5
OSMS(CS)20-85(X)-M6	233.5	85.8	35.8	100 (25x4)	10-φ4.5	42.5

OSMS(CS)20--*(X)-INCH** Hexagon socket head cap screw M3x6...4 screws



Part Number	A	B	C	D	E	F
OSMS(CS)20-35(X)-INCH	183.5	60.8	34.5	76.2 (25.4x3)	8-φ4.5	17.5
OSMS(CS)20-85(X)-INCH	233.5	85.8	35	101.6 (25.4x4)	10-φ4.5	42.5

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40mm

60mm

80mm

85mm

100mm

120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS26-(X) Stage size □100mm



Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
Reference G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS26-50(X)	OSMS26-100(X)	OSMS26-200(X)	OSMS26-300(X)	
Part Number (-M6)		OSMS26-50(X)-M6	OSMS26-100(X)-M6	OSMS26-200(X)-M6	OSMS26-300(X)-M6	
Part Number (-INCH)		OSMS26-50(X)-INCH	OSMS26-100(X)-INCH	OSMS26-200(X)-INCH	OSMS26-300(X)-INCH	
Mechanical Specifications	Travel [mm]	50	100	200	300	
	Table Size [mm] (M6, INCH)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	
	Feed Screw	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	Black anodized	
	Weight [kg]	2.2	2.7	3.8	4.0	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	4	4	4	4
		(Half) [μm/pulse]	2	2	2	2
	MAX Speed [mm/sec]	40	40	40	40	
	Positioning Accuracy [μm]	5	10	15	20	
	Positional Repeatability [μm]	3	3	6	6	
	Load Capacity [N]	117 (12.0kgf)	117 (12.0kgf)	117 (12.0kgf)	117 (12.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.23	0.23	0.23	0.23
		Yaw [°/N·cm]	0.12	0.12	0.12	0.12
		Roll [°/N·cm]	0.2	0.2	0.2	0.2
	Lost Motion [μm]	3	3	5	5	
	Backlash [μm]	3	3	3	3	
	Parallelism [μm]	50	50	50	50	
	Running Parallelism [μm]	10	10	10	20	
	Pitch [°] / Yaw [°]	25/20	25/20	30/25	30/25	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)				
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	Equipped	Equipped	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK525HPB-C4(□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

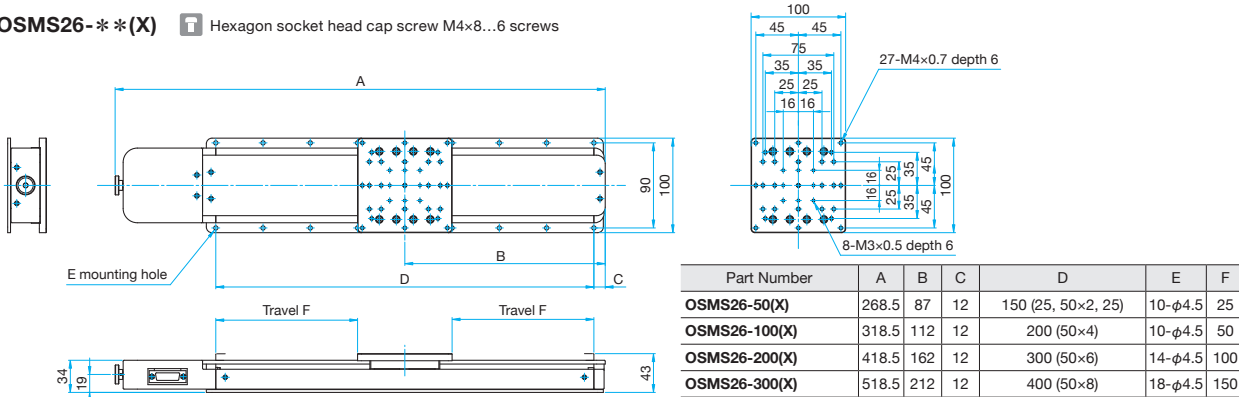
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MCS, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

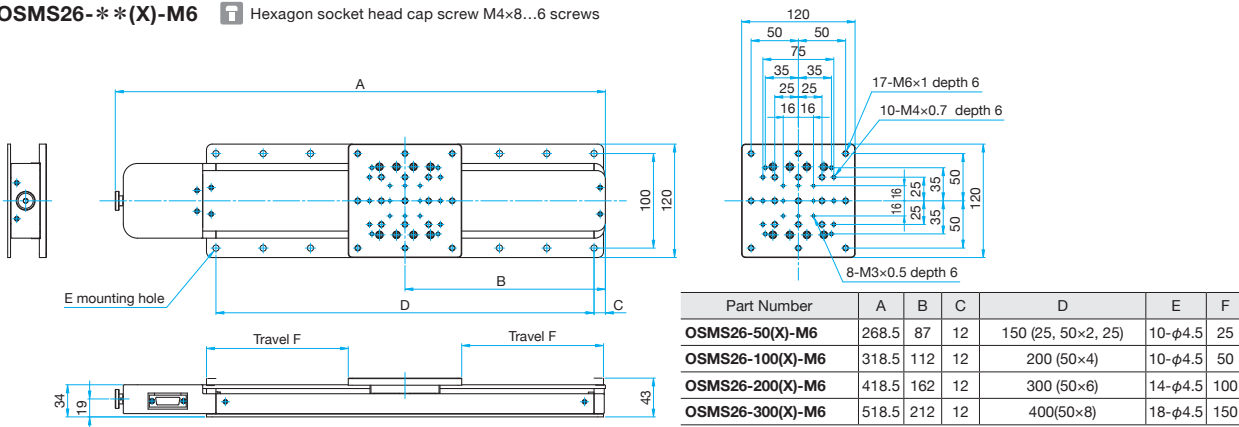


Outline Drawing

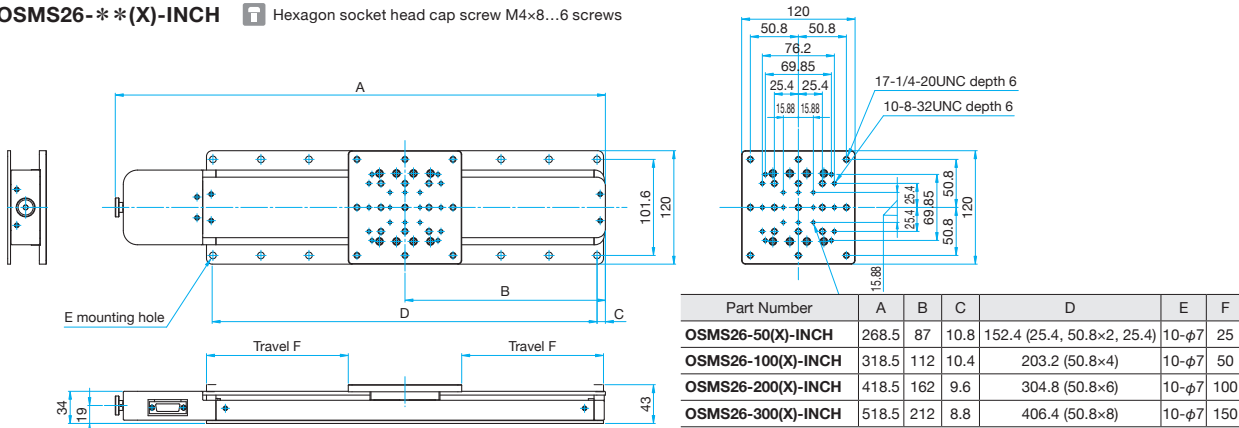
OSMS26-*(X) Hexagon socket head cap screw M4x8...6 screws



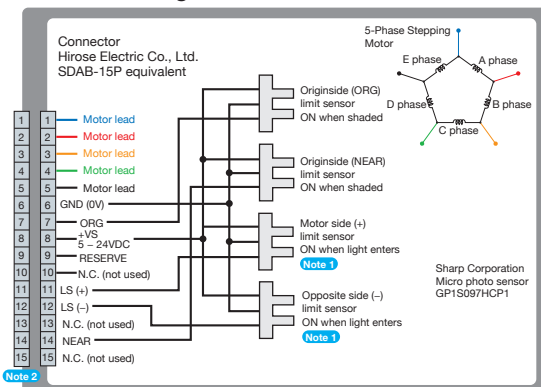
OSMS26-*(X)-M6 Hexagon socket head cap screw M4x8...6 screws



OSMS26-*(X)-INCH Hexagon socket head cap screw M4x8...6 screws



Connection Diagram



Compatible Controllers / Drivers and Cables

Controller	Cable	Stage
GSC-01 [1 axis] GSC-02 [2 axes] SHOT-702 [2 axes] GIP-101 [1 axis] SHOT-302GS [2 axes] SHOT-304GS [4 axes] HIT-M/HIT-S [8 axes] PGC-04 [4 axes] Reference > G098 - G105	 D15D15A-CA Reference > G108	OSMS26-50(X) OSMS26-100(X) OSMS26-200(X) OSMS26-300(X)
Driver Drivers Reference > G020 - G021	 DAC-SG Reference > G108	

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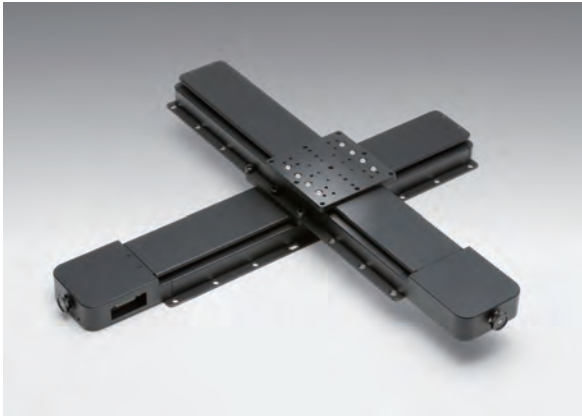
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Theta Rotation
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Vacuum
Options
□40mm
□60mm
□80mm
□85mm
□100mm
□120mm
Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS26-(XY) Stage size □100mm



Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
Reference G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

Specifications

Part Number		OSMS26-50(XY)	OSMS26-100(XY)	OSMS26-200(XY)	OSMS26-300(XY)	
Part Number (-M6)		OSMS26-50(XY)-M6	OSMS26-100(XY)-M6	OSMS26-200(XY)-M6	OSMS26-300(XY)-M6	
Part Number (-INCH)		OSMS26-50(XY)-INCH	OSMS26-100(XY)-INCH	OSMS26-200(XY)-INCH	OSMS26-300(XY)-INCH	
Mechanical Specifications	Travel [mm]	50	100	200	300	
	Table Size [mm] (M6, INCH)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	
	Feed Screw	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	Black anodized	
	Weight [kg]	4.4	5.4	7.6	8.0	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	4	4	4	4
		(Half) [μm/pulse]	2	2	2	2
	MAX Speed [mm/sec]	40	40	40	40	
	Load Capacity [N]	98 (10.0kgf)	98 (10.0kgf)	98 (10.0kgf)	98 (10.0kgf)	
	Backlash [μm]	3	3	3	3	
Orthogonality of Motion [μm]	5	5	10	5		
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)				
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	Equipped	Equipped	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK525HPB-C4 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

(Reference) Precision Specifications of Single Axis Stage

Part Number		OSMS26-50(X)	OSMS26-100(X)	OSMS26-200(X)	OSMS26-300(X)	
Accuracy Specifications	Positioning Accuracy [μm]	5	10	15	15	
	Positional Repeatability [μm]	3	3	6	6	
	Moment Stiffness	Pitch [°/N·cm]	0.23	0.23	0.23	0.23
		Yaw [°/N·cm]	0.12	0.12	0.12	0.12
		Roll [°/N·cm]	0.2	0.2	0.2	0.2
	Lost Motion [μm]	3	3	5	5	
	Parallelism [μm]	50	50	50	50	
Running Parallelism [μm]	10	10	10	10		

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

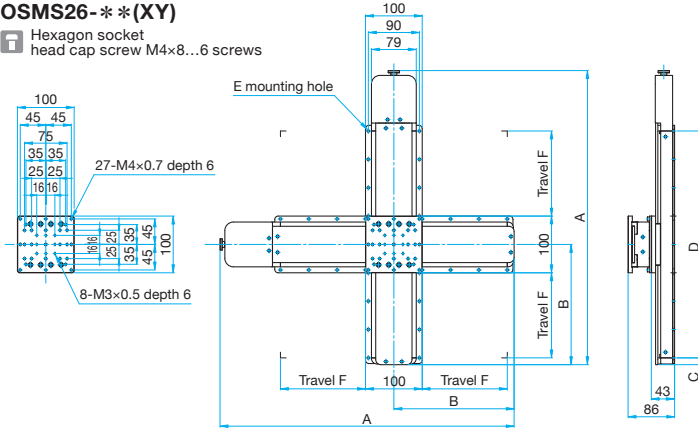
Others



Outline Drawing

OSMS26-*(XY)

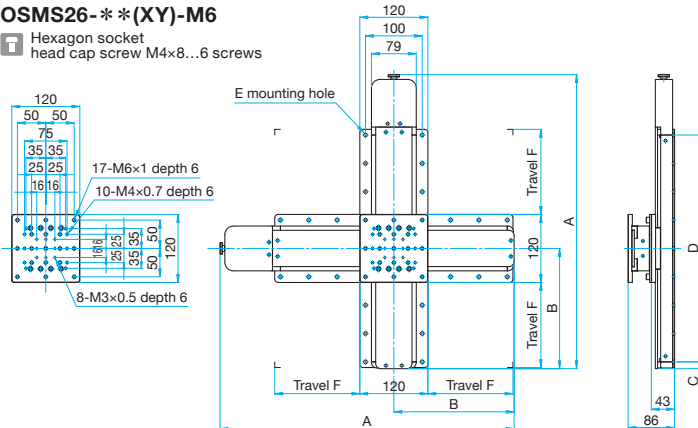
Hexagon socket head cap screw M4x8...6 screws



Part Number	A	B	C	D	E	F
OSMS26-50(XY)	268.5	87	12	150 (25, 50x2, 25)	10-φ7	25
OSMS26-100(XY)	318.5	112	12	200 (50x4)	10-φ7	50
OSMS26-200(XY)	418.5	162	12	300 (50x6)	10-φ7	100
OSMS26-300(XY)	518.5	212	12	400 (50x8)	10-φ7	150

OSMS26-*(XY)-M6

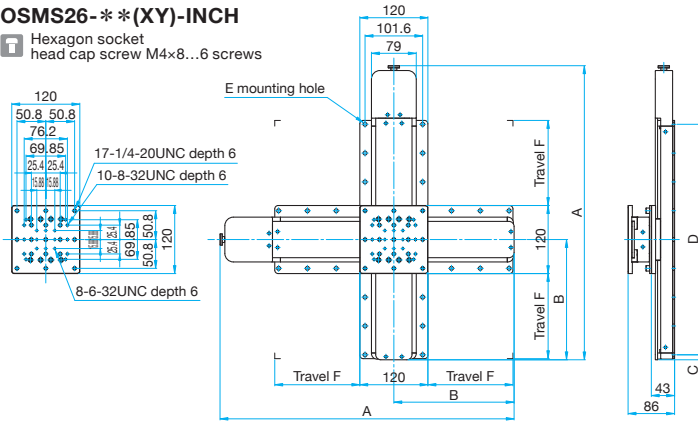
Hexagon socket head cap screw M4x8...6 screws



Part Number	A	B	C	D	E	F
OSMS26-50(XY)-M6	268.5	87	12	150 (25, 50x2, 25)	10-φ7	25
OSMS26-100(XY)-M6	318.5	112	12	200 (50x4)	10-φ7	50
OSMS26-200(XY)-M6	418.5	162	12	300 (50x6)	10-φ7	100
OSMS26-300(XY)-M6	518.5	212	12	400 (50x8)	10-φ7	150

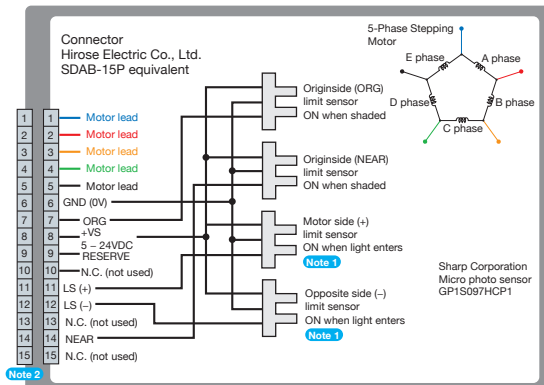
OSMS26-*(XY)-INCH

Hexagon socket head cap screw M4x8...6 screws



Part Number	A	B	C	D	E	F
OSMS26-50(XY)-INCH	268.5	87	10.8	152.4 (25.4, 50.8x2, 25.4)	10-φ7	25
OSMS26-100(XY)-INCH	318.5	112	10.4	203.2 (50.8x4)	10-φ7	50
OSMS26-200(XY)-INCH	418.5	162	9.6	304.8 (50.8x6)	10-φ7	100
OSMS26-300(XY)-INCH	518.5	212	8.8	406.4 (50.8x8)	10-φ7	150

Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

Compatible Controllers / Drivers and Cables

Controller	Cable	Stage
GSC-01 [1 axis] GSC-02 [2 axes] SHOT-702 [2 axes] GIP-101 [1 axis] SHOT-302GS [2 axes] SHOT-304GS [4 axes] HIT-M/HIT-S [8 axes] PGC-04 [4 axes] Reference > G098 - G105	D15D15A-CA Reference > G108	OSMS26-50(XY) OSMS26-100(XY) OSMS26-200(XY) OSMS26-300(XY)
Driver Drivers Reference > G020 - G021	DAC-SG Reference > G108	

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor | OSMS26-(Z) Stage size □100mm



Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
Reference G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS26-50(Z)	OSMS26-100(Z)	OSMS26-200(Z)	OSMS26-300(Z)	
Part Number (-M6)		OSMS26-50(Z)-M6	OSMS26-100(Z)-M6	OSMS26-200(Z)-M6	OSMS26-300(Z)-M6	
Part Number (-INCH)		OSMS26-50(Z)-INCH	OSMS26-100(Z)-INCH	OSMS26-200(Z)-INCH	OSMS26-300(Z)-INCH	
Mechanical Specifications	Travel [mm]	50	100	200	150	
	Table Size [mm] (M6, INCH)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	100×100 (120×120)	
	Feed Screw	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	Black anodized	
	Weight [kg]	4.4	4.9	7.2	7.4	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	4	4	4	4
		(Half) [μm/pulse]	2	2	2	2
	MAX Speed [mm/sec]	10	10	10	10	
	Positioning Accuracy [μm]	15	20	30	40	
	Positional Repeatability [μm]	3	3	6	6	
	Load Capacity [N]	39.2 (4.0kgf)	39.2 (4.0kgf)	39.2 (4.0kgf)	39.2 (4.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.4	0.4	0.4	0.4
		Yaw [°/N·cm]	0.15	0.15	0.15	0.15
		Roll [°/N·cm]	0.20	0.20	0.20	0.20
	Lost Motion [μm]	3	3	5	5	
	Backlash [μm]	3	3	3	3	
Orthogonality of Motion [μm]	30	40	50	40		
Pitch [°] / Yaw [°]	50/20	50/20	55/20	55/20		
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)				
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	Equipped	Equipped	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK525HPB-C4 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

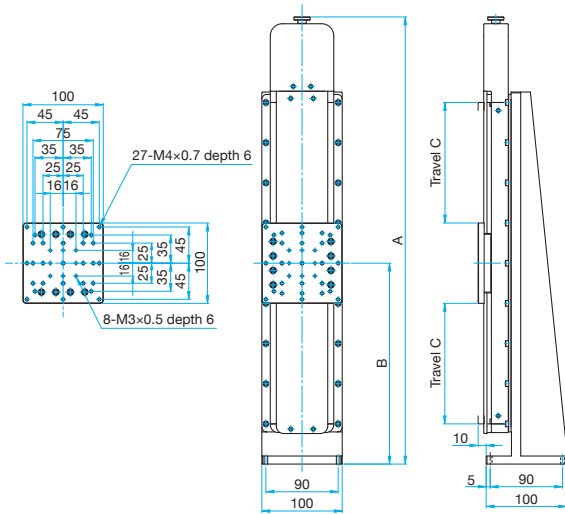
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514M5C, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04



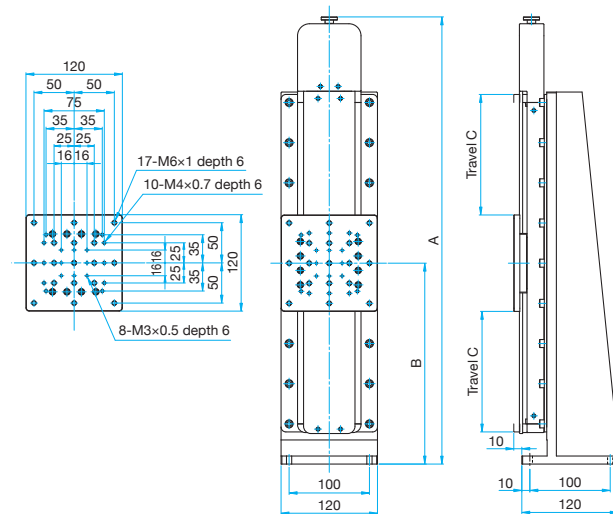
Outline Drawing

OSMS26-*(Z) Hexagon socket head cap screw M4x8...6 screws



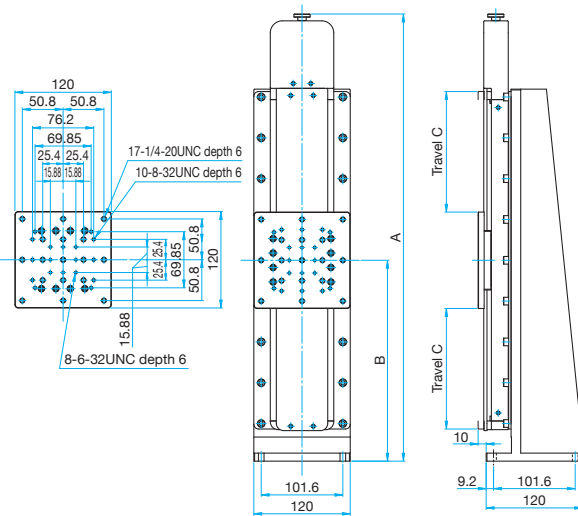
Part Number	A	B	C
OSMS26-50(Z)	306	125	25
OSMS26-100(Z)	356.5	150	50
OSMS26-200(Z)	463	200	100
OSMS26-300(Z)	556.5	250	150

OSMS26-*(Z)-M6 Hexagon socket head cap screw M4x8...6 screws



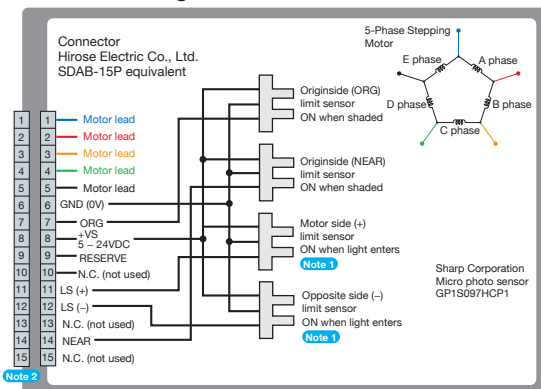
Part Number	A	B	C
OSMS26-50(Z)-M6	306	125	25
OSMS26-100(Z)-M6	356.5	150	50
OSMS26-200(Z)-M6	463	200	100
OSMS26-300(Z)-M6	556.5	250	150

OSMS26-*(Z)-INCH Hexagon socket head cap screw M4x8...6 screws



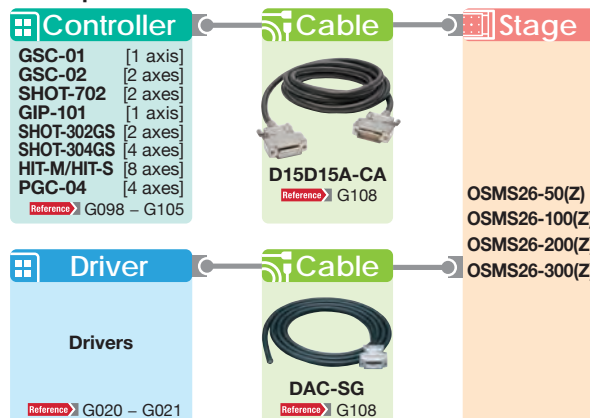
Part Number	A	B	C
OSMS26-50(Z)-INCH	305.6	124.6	25
OSMS26-100(Z)-INCH	356.5	150	50
OSMS26-200(Z)-INCH	463	199.2	100
OSMS26-300(Z)-INCH	556.5	250	150

Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

Compatible Controllers / Drivers and Cables



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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

Precision Motorized Stages with Built-in Compact Scale | OSMS(CS)26-(X) Stage size □100mm



The dedicated stage controllers (SHOT-302GS/304GS, HIT series) offer a full closed loop system with high precision and high reliability.



- The stages enable high stiffness and high precision positioning because their structure, which is strong against momentum and combined load, is less susceptible to pitching, rolling and yawing.
- A compact scale is built in, but the installation space is the same as that of other OSMS series when the travel is the same.

Guide

- ▶ Contact our International Sales Division for replacement of motors or for stabilizing (drop-preventing) mechanism.
Reference ▶ G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** ▶ G110
- ▶ Contact our International Sales Division to use the stage as an XY axis or a Z axis stage.

Specifications

Part Number		OSMS(CS)26-100(X)	OSMS(CS)26-200(X)	
Part Number (-M6)		OSMS(CS)26-100(X)-M6	OSMS(CS)26-200(X)-M6	
Part Number (-INCH)		OSMS(CS)26-100(X)-INCH	OSMS(CS)26-200(X)-INCH	
Mechanical Specifications	Travel [mm]	100	200	
	Table Size [mm] (M6, INCH)	100×100 (120×120)	100×100 (120×120)	
	Feed Screw	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	3.2	4.3	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	4	4
		(Half) [μm/pulse]	2	2
	MAX Speed [mm/sec]	40	40	
	Positioning Accuracy [μm]	10	15	
	Positional Repeatability [μm]	2	3	
	Load Capacity [N]	117 (12.0kgf)	117 (12.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.23	0.23
		Yaw [°/N·cm]	0.12	0.12
		Roll [°/N·cm]	0.2	0.2
	Lost Motion [μm]	3	5	
	Backlash [μm]	3	3	
	Parallelism [μm]	50	50	
	Running Parallelism [μm]	10	10	
	Pitch [°] / Yaw [°]	25/20	30/25	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	
Scale head	Resolution [μm]	0.5	0.5	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK525HPB-C4 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)
Scale head	Power Voltage / Current Consumption	DC5V±25% / 50mA

Compatible Cable

Cable	Driver Cable	D15D15A-CA
	Scale Cable	GSEF-CA-3

Compatible Driver / Controller

Control System	Compatible Driver	—
	Compatible Controller	SHOT-302GS, SHOT-304GS, HIT-M-HIT-S

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□40mm

□60mm

□80mm

□85mm

□100mm

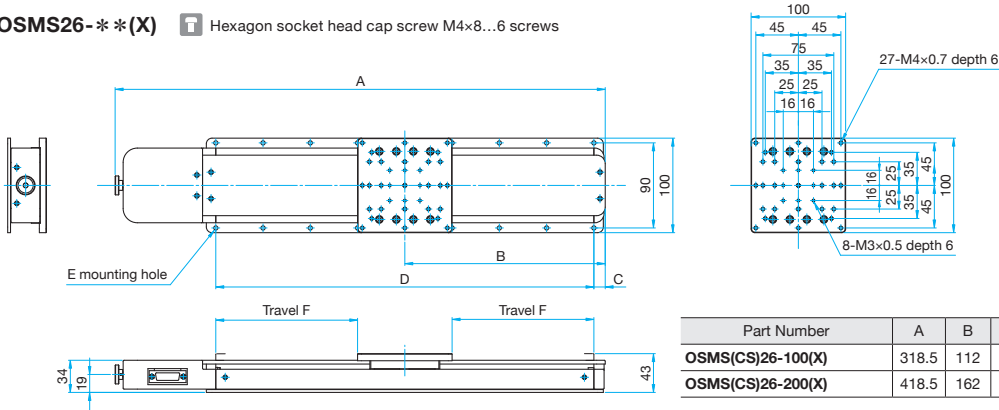
□120mm

Others



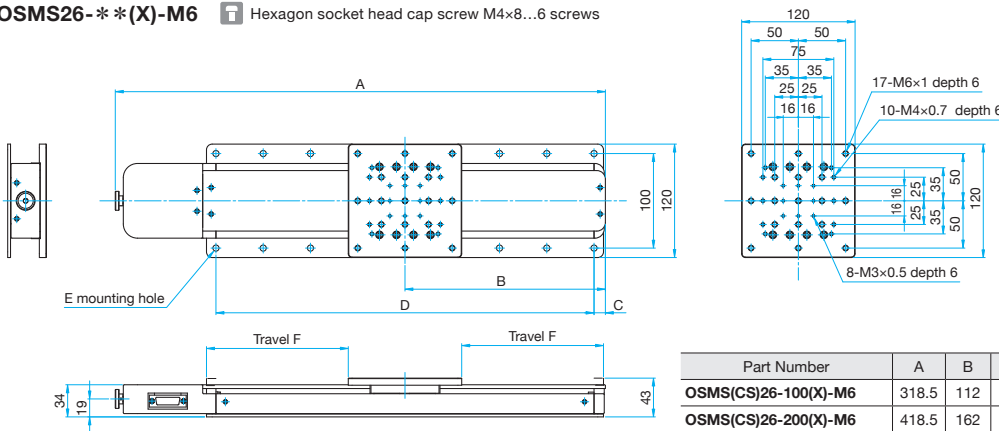
Outline Drawing

OSMS26-*(X) Hexagon socket head cap screw M4x8...6 screws



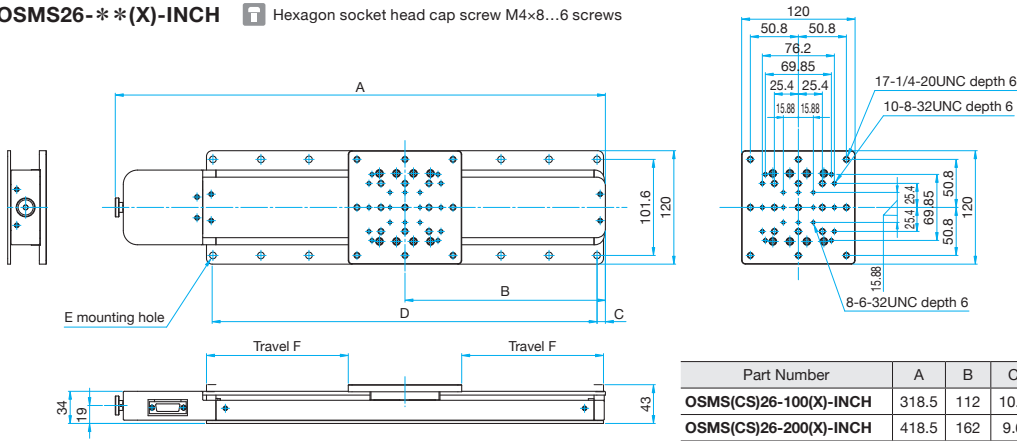
Part Number	A	B	C	D	E	F
OSMS(CS)26-100(X)	318.5	112	12	200 (50x4)	10-φ4.5	50
OSMS(CS)26-200(X)	418.5	162	12	300 (50x6)	14-φ4.5	100

OSMS26-*(X)-M6 Hexagon socket head cap screw M4x8...6 screws



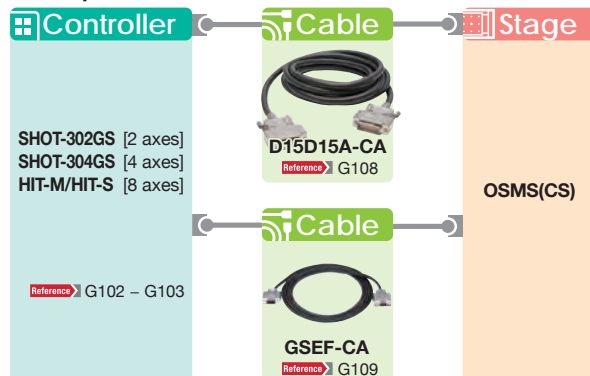
Part Number	A	B	C	D	E	F
OSMS(CS)26-100(X)-M6	318.5	112	12	200 (50x4)	10-φ4.5	50
OSMS(CS)26-200(X)-M6	418.5	162	12	300 (50x6)	14-φ4.5	100

OSMS26-*(X)-INCH Hexagon socket head cap screw M4x8...6 screws



Part Number	A	B	C	D	E	F
OSMS(CS)26-100(X)-INCH	318.5	112	10.4	203.2 (50.8x4)	10-φ7	50
OSMS(CS)26-200(X)-INCH	418.5	162	9.6	304.8 (50.8x6)	10-φ7	100

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS33-(X) Stage size □120mm

RoHS

CE

Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
Reference G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. Reference G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS33-300(X)	OSMS33-500(X)	
Part Number (-M6)		OSMS33-300(X)-M6	OSMS33-500(X)-M6	
Part Number (-INCH)		OSMS33-300(X)-INCH	OSMS33-500(X)-INCH	
Mechanical Specifications	Travel [mm]	300	500	
	Table Size [mm]	120×120	120×120	
	Feed Screw	Ball screw diameter φ10mm, 10mm lead	Ball screw diameter φ10mm, 10mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	7.0	8.6	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	20	20
		(Half) [μm/pulse]	10	10
	MAX Speed [mm/sec]	120	120	
	Positioning Accuracy [μm]	25	25	
	Positional Repeatability [μm]	6	6	
	Load Capacity [N]	196 (20.0kgf)	196 (20.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.12	0.12
		Yaw [°/N·cm]	0.08	0.08
		Roll [°/N·cm]	0.1	0.1
	Lost Motion [μm]	5	5	
	Backlash [μm]	3	3	
	Parallelism [μm]	50	50	
	Running Parallelism [μm]	15	25	
	Pitch [°] / Yaw [°]	40/25	40/25	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3667N43E967 (□42mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

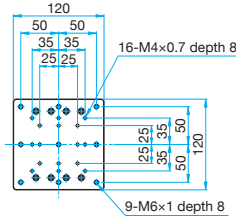
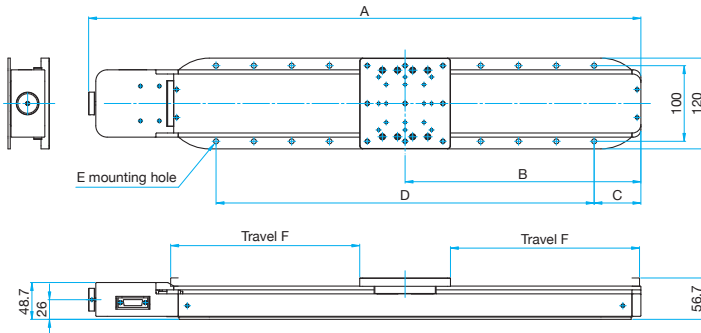
Compatible Driver / Controller

Control System	Compatible Driver	SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04



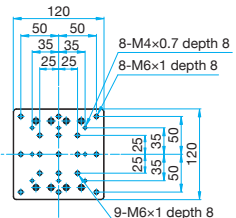
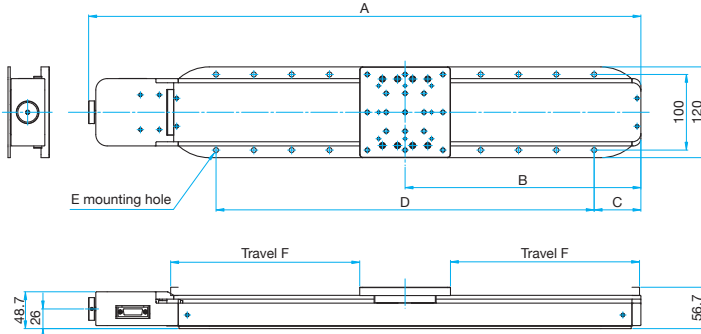
Outline Drawing

OSMS33-*(X) Hexagon socket head cap screw M5x10...4 screws



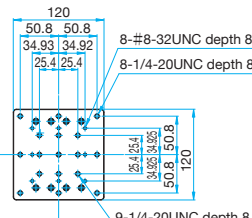
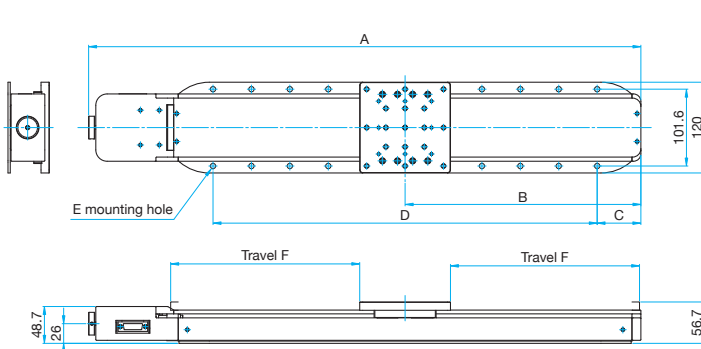
Part Number	A	B	C	D	E	F
OSMS33-300(X)	530.3	211.8	61.8	300 (50x6)	14-φ6.5	150
OSMS33-500(X)	730.3	311.8	61.8	500 (50x10)	22-φ6.5	250

OSMS33-*(X)-M6 Hexagon socket head cap screw M5x10...4 screws



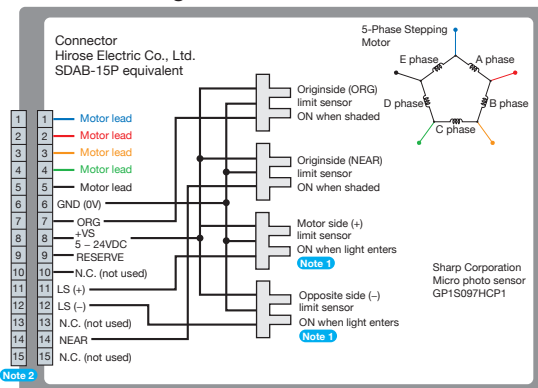
Part Number	A	B	C	D	E	F
OSMS33-300(X)-M6	530.3	211.8	61.8	300 (50x6)	14-φ6.5	150
OSMS33-500(X)-M6	730.3	311.8	61.8	500 (50x10)	22-φ6.5	250

OSMS33-*(X)-INCH Hexagon socket head cap screw M5x10...4 screws



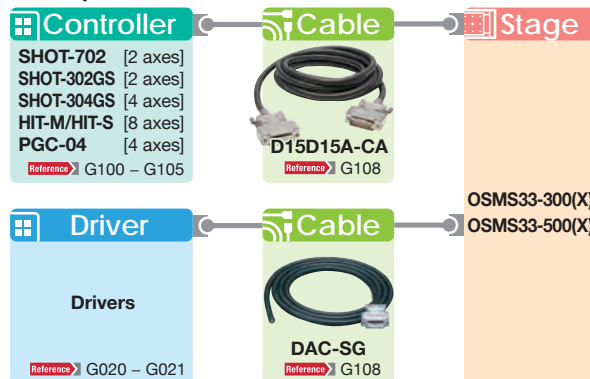
Part Number	A	B	C	D	E	F
OSMS33-300(X)-INCH	530.3	211.8	59.4	304.8 (50.8x6)	14-φ7	150
OSMS33-500(X)-INCH	730.3	311.8	57.8	508 (50.8x10)	22-φ7	250

Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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Options

□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS33-(XY) Stage size □120mm

RoHS

CE

Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
[Reference](#) G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. [Reference](#) G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		OSMS33-300(XY)	OSMS33-500(XY)
Part Number (-M6)		OSMS33-300(XY)-M6	OSMS33-500(XY)-M6
Part Number (-INCH)		OSMS33-300(XY)-INCH	OSMS33-500(XY)-INCH
Mechanical Specifications	Travel [mm]	300	500
	Table Size [mm]	120×120	120×120
	Feed Screw	Ball screw diameter φ10mm, 10mm lead	Ball screw diameter φ10mm, 10mm lead
	Positioning Slide	Outer rail structure	Outer rail structure
	Stage Material	Aluminum	Aluminum
	Finish	Black anodized	Black anodized
	Weight [kg]	14.0	17.2
Accuracy Specifications	Resolution	(Full) [μm/pulse]	20
		(Half) [μm/pulse]	10
	MAX Speed [mm/sec]	80	80
	Load Capacity [N]	156 (16.0kgf)	156 (16.0kgf)
	Backlash [μm]	3	3
	Orthogonality of Motion [μm]	5	5
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF(Sharp Corporation)	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor	None	None
	Proximity Origin Sensor	None	None

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3667N43E967 (□42mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	40mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

(Reference) Precision Specifications of Single Axis Stage

Part Number		OSMS33-300(X)	OSMS33-500(X)	
Accuracy Specifications	Positioning Accuracy [μm]	15	20	
	Positional Repeatability [μm]	6	6	
	Moment Stiffness	Pitch [°/N·cm]	0.12	0.12
		Yaw [°/N·cm]	0.08	0.08
		Roll [°/N·cm]	0.08	0.08
	Lost Motion [μm]	5	5	
	Parallelism [μm]	50	50	
Running Parallelism [μm]	10	10		

Compatible Driver / Controller

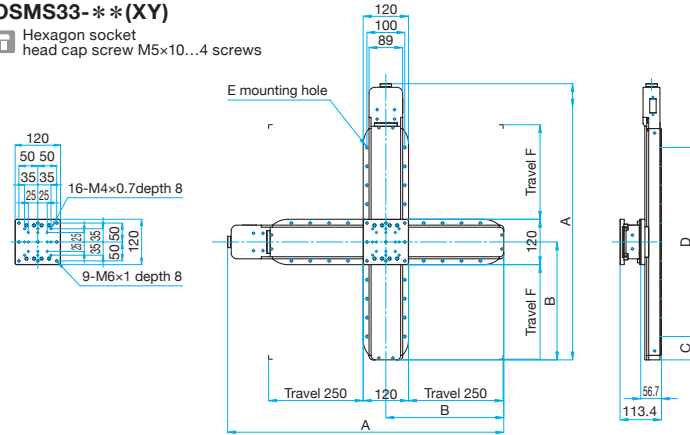
Control System	Compatible Driver	SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04



Outline Drawing

OSMS33-*(XY)

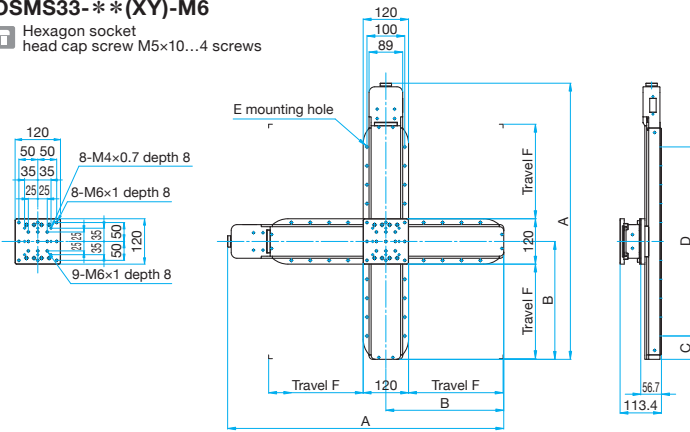
Hexagon socket head cap screw M5x10...4 screws



Part Number	A	B	C	D	E	F
OSMS33-300(XY)	530.3	211.8	61.8	300 (50x6)	14-φ7	150
OSMS33-500(XY)	730.3	311.8	61.8	500 (50x10)	22-φ7	250

OSMS33-*(XY)-M6

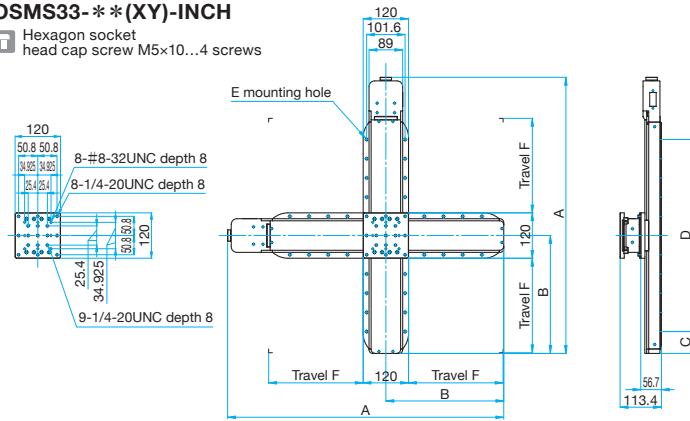
Hexagon socket head cap screw M5x10...4 screws



Part Number	A	B	C	D	E	F
OSMS33-300(XY)-M6	530.3	211.8	61.8	300 (50x6)	14-φ7	150
OSMS33-500(XY)-M6	730.3	311.8	61.8	500 (50x10)	22-φ7	250

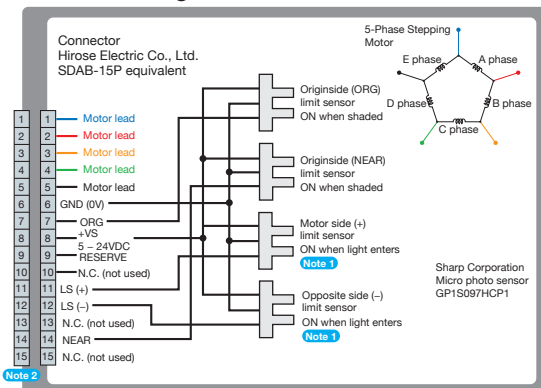
OSMS33-*(XY)-INCH

Hexagon socket head cap screw M5x10...4 screws



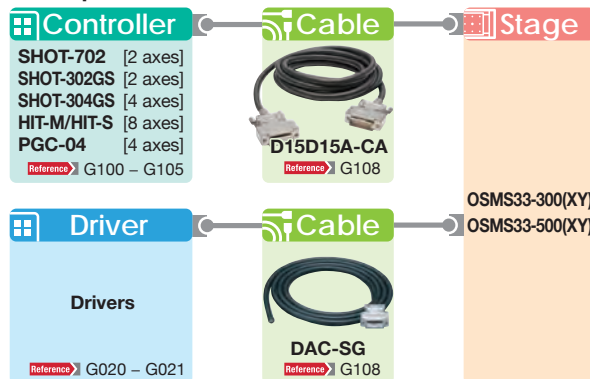
Part Number	A	B	C	D	E	F
OSMS33-300(XY)-INCH	530.3	211.8	59.4	304.8 (50.8x6)	14-φ7	150
OSMS33-500(XY)-INCH	730.3	311.8	57.8	508 (50.8x10)	22-φ7	250

Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

OSMS Series Translation Motorized Stages - 5 Phase Stepping Motor

OSMS33-(Z)

RoHS

CE

Stepping motor driven stages, ideal for positioning of measuring instruments or inspection tools from which high stiffness and high precision are required.



- U-shaped rail offers light weight, and minimized deflection to achieve high stiffness.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc.
[Reference](#) G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. [Reference](#) G110
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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Options

 40mm 60mm 80mm 85mm 100mm 120mm

Others

Specifications

Part Number		OSMS33-300(Z)	OSMS33-500(Z)	
Part Number (-M6)		OSMS33-300(Z)-M6	OSMS33-500(Z)-M6	
Part Number (-INCH)		OSMS33-300(Z)-INCH	OSMS33-500(Z)-INCH	
Mechanical Specifications	Travel [mm]	300	500	
	Table Size [mm]	120×120	120×120	
	Feed Screw	Ball screw diameter ϕ 10mm, 10mm lead	Ball screw diameter ϕ 10mm, 10mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	14.5	16.1	
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	20	20
		(Half) [μ m/pulse]	10	10
	MAX Speed [mm/sec]	30	30	
	Positioning Accuracy [μ m]	50	50	
	Positional Repeatability [μ m]	6	6	
	Load Capacity [N]	68.6 (7.0kgf)	68.6 (7.0kgf)	
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.2	0.2
		Yaw [$^{\circ}$ /N·cm]	0.15	0.15
		Roll [$^{\circ}$ /N·cm]	0.15	0.15
	Lost Motion [μ m]	5	5	
	Backlash [μ m]	3	3	
	Orthogonality of Motion [μ m]	30	35	
	Pitch [$^{\circ}$] / Yaw [$^{\circ}$]	50/25	55/25	
	Sensor Part Number	Micro photo sensor: GP1S092HCPIF(Sharp Corporation)		
Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)		
Origin Sensor	None	None		
Proximity Origin Sensor	None	None		

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3667N43E967 (\square 42mm)
	Step Angle	0.72 $^{\circ}$
Sensor	Power Voltage	DC5 - 24V \pm 10%
	Current Consumption	40mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

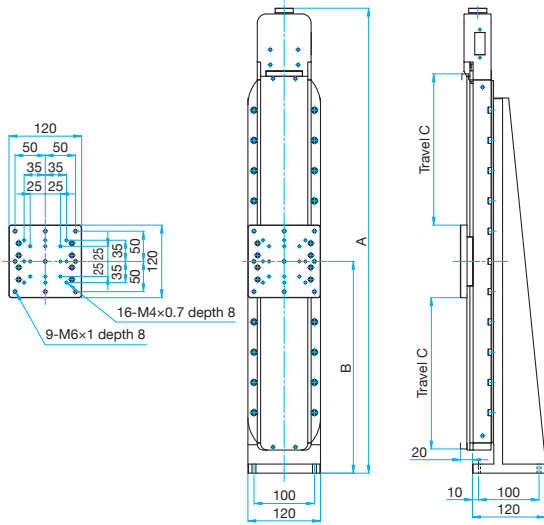
Compatible Driver / Controller

Control System	Compatible Driver	SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04



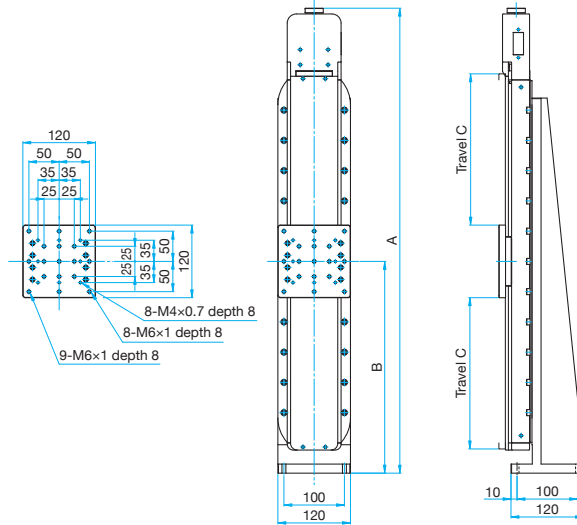
Outline Drawing

OSMS33-*(Z) Hexagon socket head cap screw M4x8...6 screws



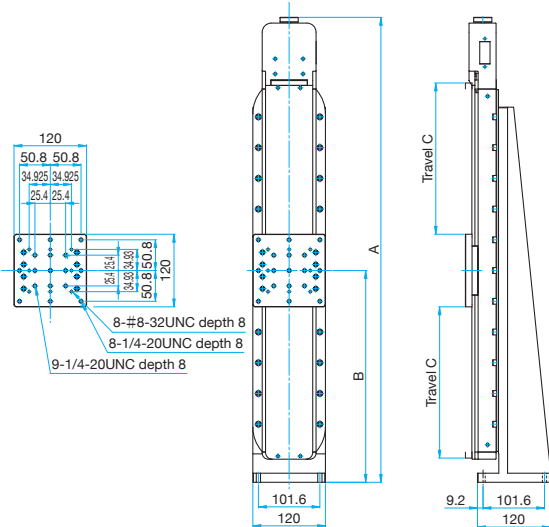
Part Number	A	B	C
OSMS33-300(Z)	620	250	150
OSMS33-500(Z)	768.5	350	250

OSMS33-*(Z)-M6 Hexagon socket head cap screw M4x8...6 screws



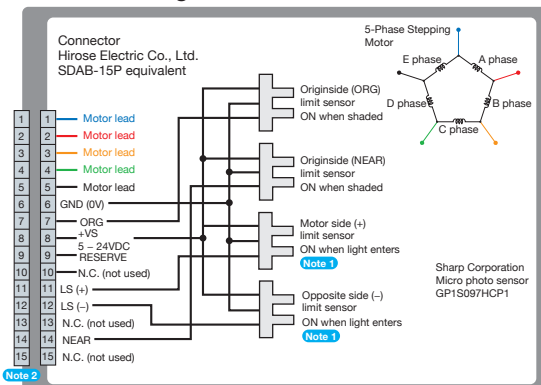
Part Number	A	B	C
OSMS33-300(Z)-M6	620	250	150
OSMS33-500(Z)-M6	768.5	350	250

OSMS33-*(Z)-INCH Hexagon socket head cap screw M4x8...6 screws



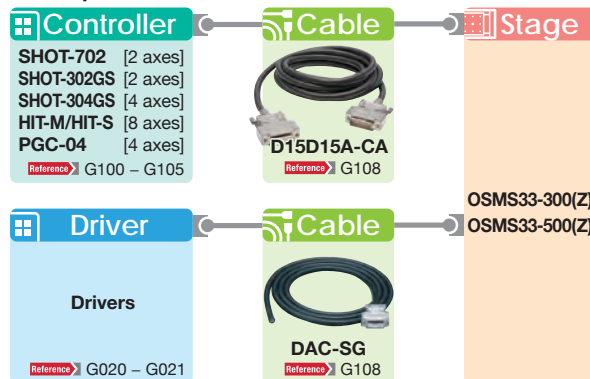
Part Number	A	B	C
OSMS33-300(Z)-INCH	620	248.4	150
OSMS33-500(Z)-INCH	768.5	350	250

Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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40mm

60mm

80mm

85mm

100mm

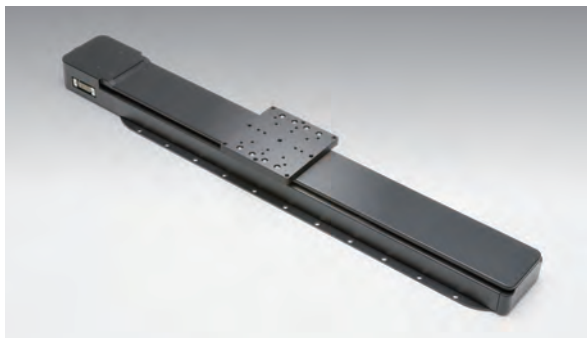
120mm

Others

Precision Motorized Stages with Built-in Compact Scale | OSMS(CS)33-(X) Stage size □120mm



The dedicated stage controllers (SHOT-302GS/304GS, HIT series) offer a full closed loop system with high precision and high reliability.



- The stages enable high stiffness and high precision positioning because their structure, which is strong against momentum and combined load, is less susceptible to pitching, rolling and yawing.
- A compact scale is built in, but the installation space is the same as that of other OSMS series when the travel is the same.

Guide

- ▶ Contact our International Sales Division for replacement of motors or for stabilizing (drop-preventing) mechanism.
Reference ▶ G017, G111 (Motorized Stage System Question Sheet)
- ▶ Grease change is optionally available. **Reference** ▶ G110
- ▶ Contact our International Sales Division to use the stage as an XY axis or a Z axis stage.

Specifications

Part Number		OSMS(CS)33-300(X)	OSMS(CS)33-500(X)	
Part Number (-M6)		OSMS(CS)33-300(X)-M6	OSMS(CS)33-500(X)-M6	
Part Number (-INCH)		OSMS(CS)33-300(X)-INCH	OSMS(CS)33-500(X)-ICH	
Mechanical Specifications	Travel [mm]	300	500	
	Table Size [mm]	120×120	120×120	
	Feed Screw	Ball screw diameter φ10mm, 10mm lead	Ball screw diameter φ10mm, 10mm lead	
	Positioning Slide	Outer rail structure	Outer rail structure	
	Stage Material	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	
	Weight [kg]	7.8	9.6	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	20	20
		(Half) [μm/pulse]	10	10
	MAX Speed [mm/sec]	100	100	
	Positioning Accuracy [μm]	25	25	
	Positional Repeatability [μm]	5	5	
	Load Capacity [N]	196 (20.0kgf)	196 (20.0kgf)	
	Moment Stiffness	Pitch [°/N·cm]	0.12	0.12
		Yaw [°/N·cm]	0.08	0.08
		Roll [°/N·cm]	0.1	0.1
	Lost Motion [μm]	5	5	
	Backlash	3	3	
	Parallelism [μm]	50	50	
	Running Parallelism [μm]	15	25	
	Pitch [°] / Yaw [°]	40/25	40/25	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF (Sharp Corporation)		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped	Equipped	
	Proximity Origin Sensor	Equipped	Equipped	
Scale head	Resolution [μm]	0.5	0.5	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3667N43E967 (□42mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	80mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)
Scale head	Power Voltage / Current Consumption	DC5V±5% / 100mA

Compatible Cable

Cable	Driver Cable	D15D15A-CA
	Scale Cable	GSEF-CA-3

Compatible Driver / Controller

Control System	Compatible Driver	—
	Compatible Controller	SHOT-302GS, SHOT-304GS, HIT-M-HIT-S

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□40mm

□60mm

□80mm

□85mm

□100mm

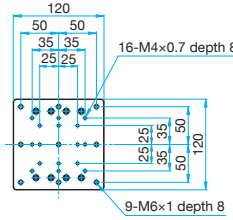
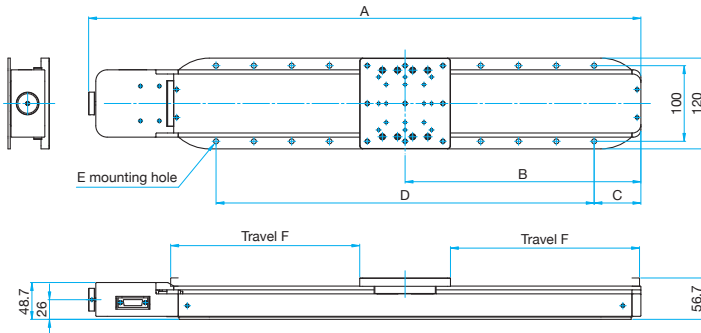
□120mm

Others



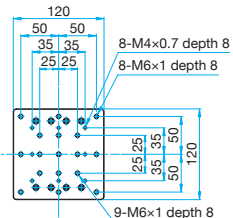
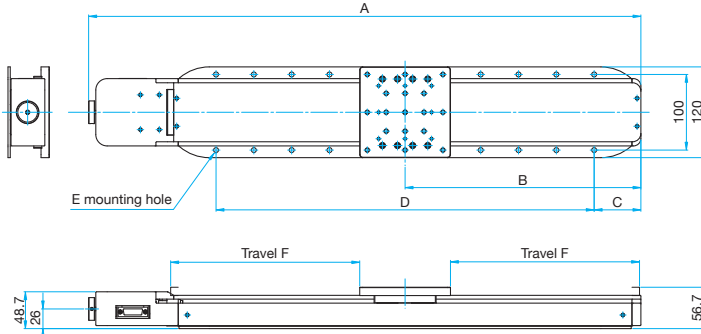
Outline Drawing

OSMS(CS)33-*(X) Hexagon socket head cap screw M5×10...4 screws



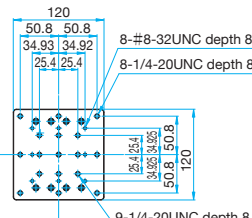
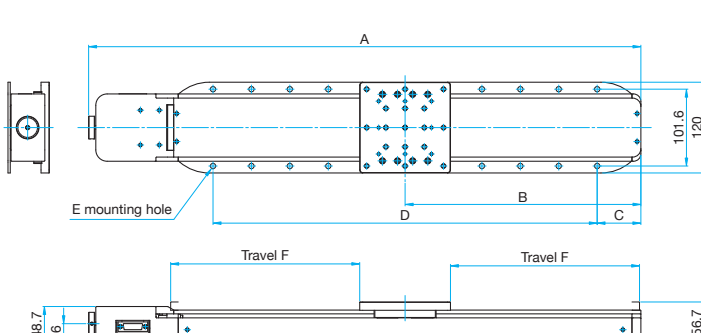
Part Number	A	B	C	D	E	F
OSMS(CS)33-300(X)	530.3	211.8	61.8	300 (50×6)	14-φ7	150
OSMS(CS)33-500(X)	730.3	311.8	61.8	500 (5×10)	22-φ7	250

OSMS(CS)33-*(X)-M6 Hexagon socket head cap screw M5×10...4 screws



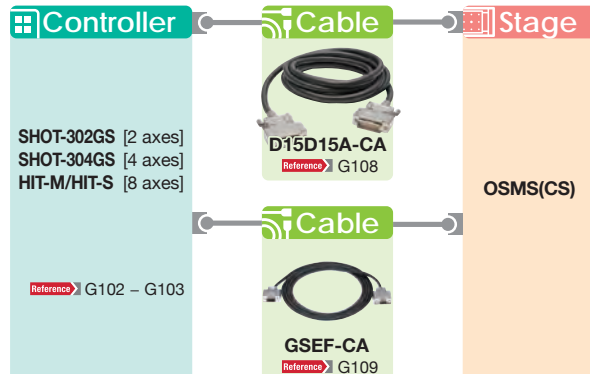
Part Number	A	B	C	D	E	F
OSMS(CS)33-300(X)-M6	530.3	211.8	61.8	300 (50×6)	14-φ7	150
OSMS(CS)33-500(X)-M6	730.3	311.8	61.8	500 (5×10)	22-φ7	250

OSMS(CS)33-*(X)-INCH Hexagon socket head cap screw M5×10...4 screws



Part Number	A	B	C	D	E	F
OSMS(CS)33-300(X)-INCH	530.3	211.8	59.4	304.8 (50.8×6)	14-φ7	150
OSMS(CS)33-500(X)-INCH	730.3	311.8	57.8	508 (50.8×10)	22-φ7	250

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40mm

60mm

80mm

85mm

100mm

120mm

Others

SGMV series Translation Motorized Stages - AC servo Motor

SGMV **RoHS**

High precision/high stiffness stages driven by AC servo motor.



- The stage structure unifies the functions of precision linear guide and precision ball screw, places the linear guide, inner block (table) and drive ball screw at the same position, and uses high stiffness U-shape outer rail for the guide to offer small footprint with large load rating.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications			SGMV20-35(X)	SGMV20-80(X)	SGMV26-100(X)	SGMV26-200(X)	
Part Number							
Mechanical Specifications	Travel [mm]		35	80	100	200	
	Table Size [mm]		60×60	60×60	80×80	80×80	
	Feed Screw		Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ8mm, 2mm lead	Ball screw diameter φ8mm, 2mm lead	
	Positioning Slide		Outer rail structure	Outer rail structure	Outer rail structure	Outer rail structure	
	Stage Material		Aluminum	Aluminum	Aluminum	Aluminum	
	Finish		Black anodized	Black anodized	Black anodized	Black anodized	
	Weight [kg]		0.7	1	1.7	2.5	
Accuracy Specifications	Resolution	(Full) [μm/pulse]	2	2	4	4	
		(Half) [μm/pulse]	1	1	2	2	
	MAX Speed [mm/sec]		35	80	130	130	
	Positioning Accuracy [μm]		7	10	10	15	
	Positional Repeatability [μm]		4	5	5	6	
	Load Capacity [N]		80 (8kgf)	80 (8kgf)	130 (13kgf)	130 (13kgf)	
	Moment Stiffness	Pitch [°/N·cm]		0.4	0.4	0.23	0.23
		Yaw [°/N·cm]		0.25	0.25	0.12	0.12
		Roll [°/N·cm]		0.35	0.35	0.2	0.2
	Lost Motion [μm]		2	2	2	2	
	Backlash [μm]		2	2	2	2	
	Parallelism [μm]		30	30	50	50	
	Running Parallelism [μm]		10	10	10	10	
Pitch [°] / Yaw [°]		30/20	30/20	30/20	30/25		
Sensor	Sensor Part Number		Micro photo sensor: PM-L24 (SUNX Co.,Ltd.)				
	Limit Sensor		Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor		None	None	None	None	
	Proximity Origin Sensor		None	None	None	None	

Motor / Sensor Specifications

Motor	Type	AC servo Motor 10W (YASKAWA Electric Corporation)
	Motor Part Number	SGMMV-A1E2A21 (□25mm)
	Step Angle	0.0318N·m
Sensor	Power Voltage	DC5 - 24V±10%
	Current Consumption	30mA or lower (15mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

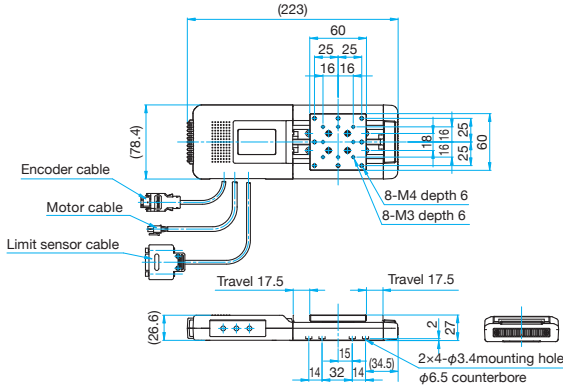
Compatible Driver / Controller

Control System	Compatible Driver	SGDV-2R9EP1A
	Compatible Controller	PGC-04

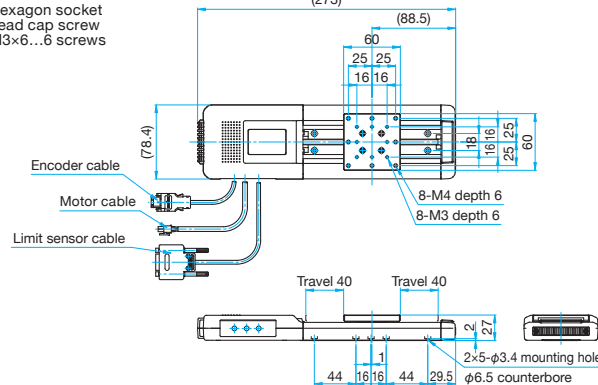


Outline Drawing

SGMV20-35(X) Hexagon socket head cap screw M3×6...6 screws

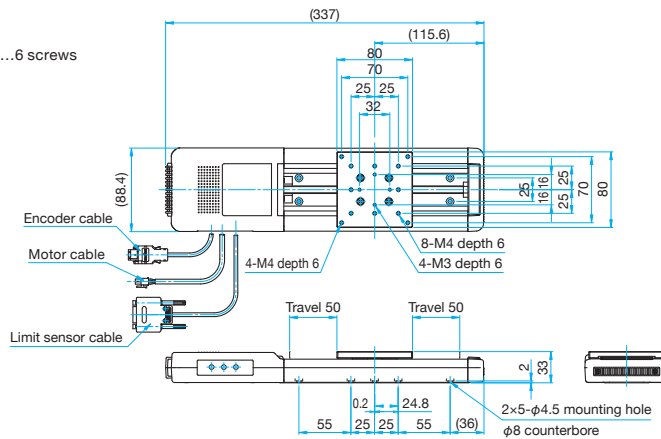


SGMV20-80(X) Hexagon socket head cap screw M3×6...6 screws



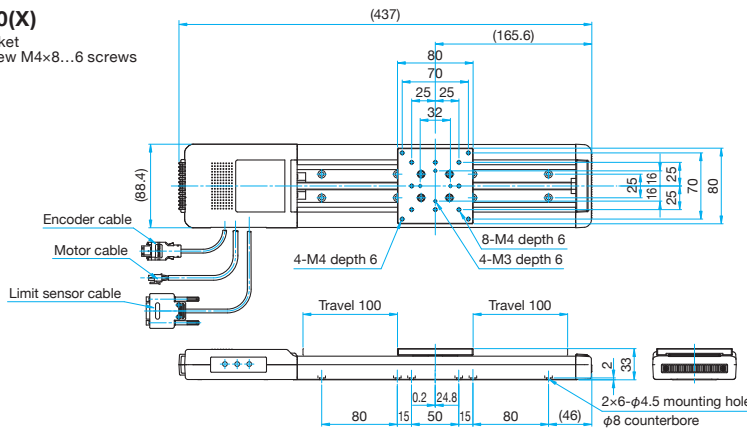
SGMV26-100(X)

Hexagon socket head cap screw M4×8...6 screws



SGMV26-200(X)

Hexagon socket head cap screw M4×8...6 screws



Encoder cable*2
Cable Length ≈280mm
Plug: 55102-0600 (Molex Japan Co., Ltd.)

Motor cable*2
Cable Length ≈280mm
Receptacle: 43025-0400 (Molex Japan Co., Ltd.)

Limit sensor cable
Cable Length ≈280mm
D-sub9Pin (JAE)
Connector DE-9P-NR
Hood DE-C8-J9-F1-1R

*2 Servo Pack SGD2V-2R9EP1A

Controller / Servo Pack

Part Number	Products Name
PGC-04	Pulus Generating Controller
SGDV-2R9EP1A	Servo Packs for Driving Servo Motor



PGC-04

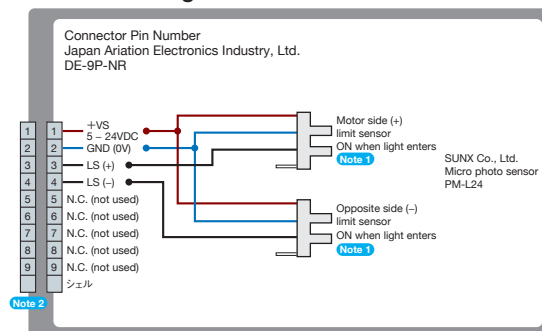


SGDV-2R9EP1A

Cable

Part Number	Controller Side	Stage Side	Servo Pack Side	Cable Length [m]
PGC-ACS-2	10126-3000PE	DE-957S-NR	10126-3000PE	2
JZSP-CF1M00-03E	-	-	-	3
JZSP-CMP00-03E	-	-	-	3
JZSP-CF1G00-01-E	-	-	-	1

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- Options
- 40mm
- 60mm
- 85mm
- 100mm
- 120mm
- Others

Thin Long Travel Stage | **KLSA/KLSS****RoHS**

These stages are thin but ensure long travel.
These thin motorized stages can minimize the stage height even when used in combination.



- Four linear guide blocks are located at optimal positions to improve positional repeatability.
- To place importance on price, KLSA which has an aluminum body is recommended. To place importance on rigidity, KLSS which has a steel body is recommended.

Guide

- ▶ Please contact us when assembled into XYZ axis or use in reversion on the ceiling or vertical direction.
- ▶ Opposite model or various motor changes are optionally available.
Reference G030

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Options

 40mm 60mm 80mm 85mm 100mm 120mm

Others

Specifications			KLSA-100X	KLSS-100X	KLSA-200X	KLSS-200X	
Part Number			KLSA-100X	KLSS-100X	KLSA-200X	KLSS-200X	
Mechanical Specifications	Travel [mm]		100	100	200	200	
	Table Size [mm]		80×80	80×80	120×120	120×120	
	Feed Screw		Ball screw diameter ϕ 8mm, 2mm lead	Ball screw diameter ϕ 8mm, 2mm lead	Ball screw diameter ϕ 10mm, 5mm lead	Ball screw diameter ϕ 10mm, 5mm lead	
	Positioning Slide		Liner guide	Liner guide	Liner guide	Liner guide	
	Stage Material		Aluminum	Steel	Aluminum	Steel	
	Finish		Black anodized	Black chromium oxide	Black anodized	Black chromium oxide	
	Weight [kg]		2.2	3.5	5.1	7.7	
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	4	4	10	10	
		(Half) [μ m/pulse]	2	2	5	5	
	MAX Speed [mm/sec]		30	30	50	50	
	Positioning Accuracy [μ m]		15	15	20	20	
	Positional Repeatability [μ m]		\pm 1	\pm 1	\pm 1	\pm 1	
	Load Capacity [N]		147 (15kgf)	147 (15kgf)	294 (30kgf)	294 (30kgf)	
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]		0.05	0.05	0.02	0.02
		Yaw [$^{\circ}$ /N·cm]		0.05	0.05	0.02	0.02
		Roll [$^{\circ}$ /N·cm]		0.1	0.1	0.02	0.02
	Lost Motion [μ m]		4	4	4	4	
	Backlash [μ m]		1	1	1	1	
	Parallelism [μ m]		50	50	50	50	
	Orthogonality of Motion [μ m]		10	10	10	10	
Pitch [$^{\circ}$] / Yaw [$^{\circ}$]		20/15	20/15	40/20	40/20		
Sensor	Sensor Part Number	Micro photo sensor: PM-L24 (SUNX Co.,Ltd.) Limit sensor, origin sensor					
	Limit Sensor		Equipped	Equipped	Equipped	Equipped	
	Origin Sensor		Equipped	Equipped	Equipped	Equipped	
	Proximity Origin Sensor		None	None	None	None	

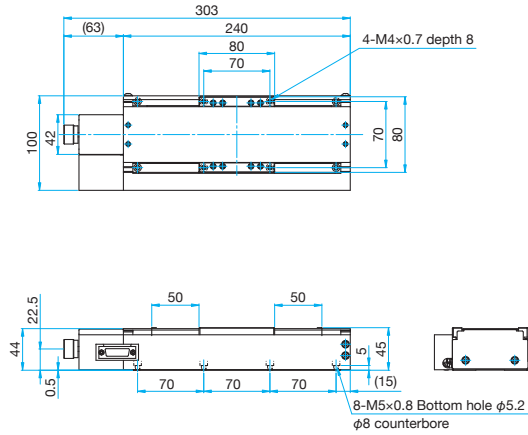
Motor / Sensor Specifications		
Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK545-NBW (\square 42mm)
	Step Angle	0.72 $^{\circ}$
Sensor	Power Voltage	DC+5V - +24V
	Current Consumption	45mA or lower (15mA or lower per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	In the case of light shielded ,output transistor OFF (No conduction): Limit sensor In the case of light shielded ,output transistor ON (Conduction): Origin sensor

Compatible Driver / Controller		
Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, MC-7514PCL
	Compatible Controller	SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

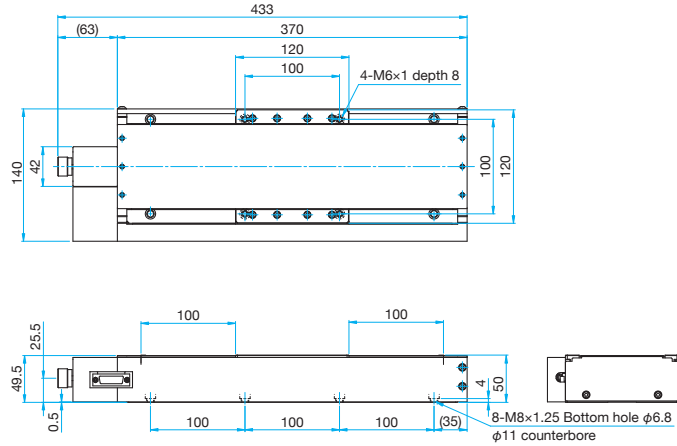


Outline Drawing

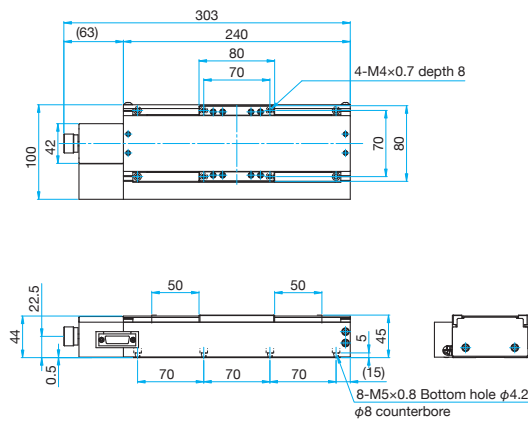
KLSS-100X Hexagon socket head cap screw M4x8...6 screws



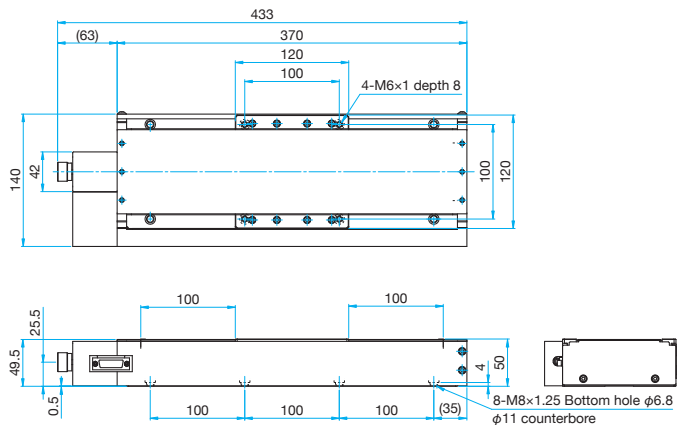
KLSS-200X Hexagon socket head cap screw M4x8...6 screws



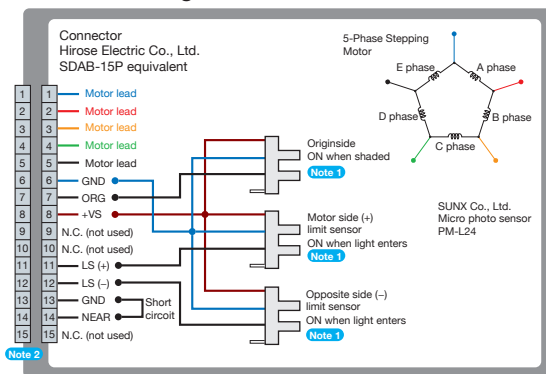
KLSS-100X Hexagon socket head cap screw M4x8...6 screws



KLSS-200X Hexagon socket head cap screw M4x8...6 screws

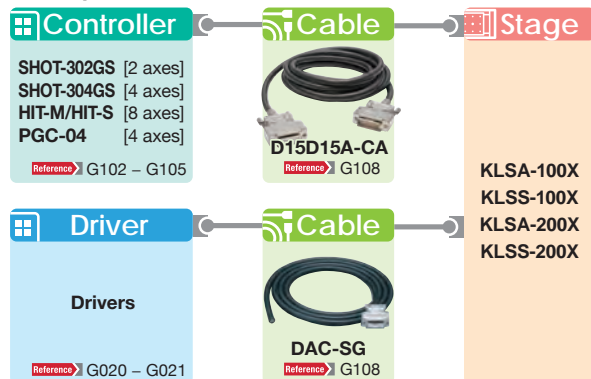


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with origin and proximity origin sensors.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

Compatible Controllers / Drivers and Cables



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60mm

80mm

85mm

100mm

120mm

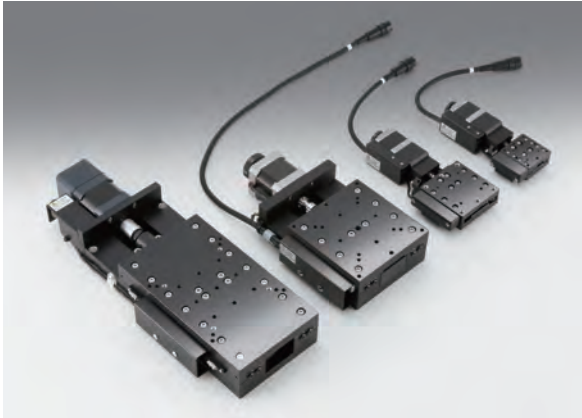
Others

Aluminum Crossed Roller Guide Motorized Stage

TAMM Stage size □40/□60/□100mm

RoHS

Motorized crossed roller stages that combine compactness, low-profile and high durability.



- Linear motorized stages fitted with anti-creep crossed roller guide and special nut-shape ball screw configuration, offering low-profile and high durability.
- Aluminum is used as a main material to achieve light-weight, compact and slim body, effective for spacesaving.

Guide

- ▶ A spacer is required when fixing the stage on a vibration isolator bench. It can be purchased separately. [Reference](#) D055 -
- ▶ After purchasing two X axis stages, to assemble them into an XY axis stage, assembly adjustment cost and performance inspection cost will be charged separately.
- ▶ Contact our International Sales Division if you desire to change motors, etc. Or, use the motorized stage system question sheet. [Reference](#) G111

Specifications

Part Number		TAMM40-10C	TAMM60-15C	TAMM100-50C	TAMM100-100C
Opposite ModelPart Number		TAMM40-10CR	TAMM60-15CR	TAMM100-50CR	TAMM100-100CR
Mechanical Specifications	Travel [mm]	10	15	50	100
	Table Size [mm]	40×40	60×60	100×100	100×175
	Feed Screw	Ball screw diameter φ4mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ8mm, 1mm lead	Ball screw diameter φ8mm, 1mm lead
	Positioning Slide	Crossed roller guide	Crossed roller guide	Crossed roller guide	Crossed roller guide
	Stage Material	Aluminum	Aluminum	Aluminum	Aluminum
	Finish	Black anodized	Black anodized	Black anodized	Black anodized
	Weight [kg]	0.33	0.48	1.9	2.9
Resolution	(Full) [μm/pulse]	2	2	2	2
	(Half) [μm/pulse]	1	1	1	1
Accuracy Specifications	MAX Speed [mm/sec]	10	10	10	10
	Positioning Accuracy [μm]	6	6	6	10
	Positional Repeatability [μm]	1	1	1	1
	Load Capacity [N]	29.4 (3.0kgf)	49 (5.0kgf)	98 (10.0kgf)	98 (10.0kgf)
	Moment Stiffness[$\frac{1}{N} \cdot \text{cm}$]	1.5	0.5	0.05	0.03
	Lost Motion [μm]	1	1	1	1
	Backlash [μm]	1	1	1	1
	Parallelism [μm]	30	30	30	30
	Running Parallelism [μm]	10	10	10	10
	Pitch [°] / Yaw [°]	25/25	20/20	20/15	20/15
Sensor	Sensor Part Number	Micro photo sensor: GP1S097HCZ (Sharp Corporation) Limit Sensor, Origin Sensor		Micro photo sensor: PM-L24 (SUNX Co.,Ltd.) Limit Sensor, Origin Sensor	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)
	Proximity Origin Sensor	None	None	None	None

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)	
	Motor Part Number	C9863-90215P (□28mm)	PK544NBW (□42mm)
	Step Angle	0.72°	
Sensor	Power Voltage	DC+5V - +24V	
	Current Consumption	60mA or lower (20mA or lower per sensor)	
	Control Output	NPN open collector output 50mA	
	Output Logic	In the case of light shielded ,output transistor OFF (No conduction): Limit sensor In the case of light shielded ,output transistor ON (Conduction): Origin sensor	

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL	SG-5M, SG-55M, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04	SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

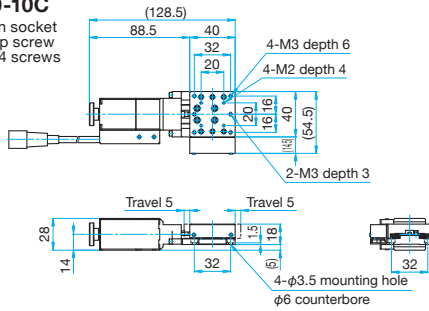
Others



Outline Drawing

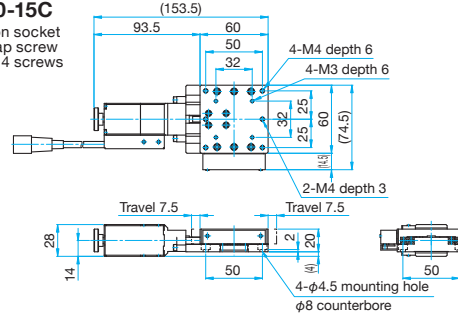
TAMM40-10C

Hexagon socket head cap screw M3x6...4 screws

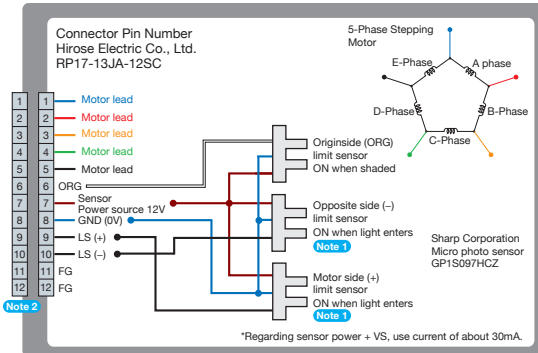


TAMM60-15C

Hexagon socket head cap screw M4x8...4 screws

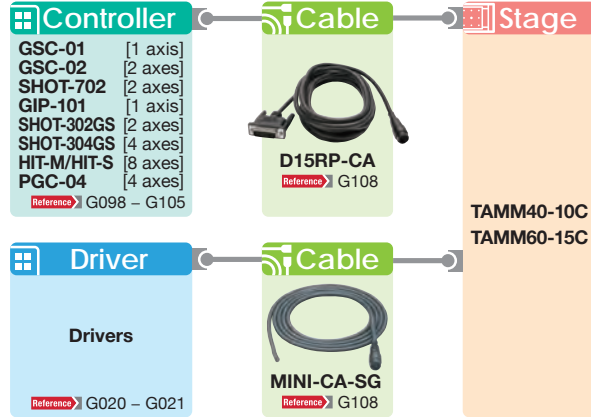


Connection Diagram



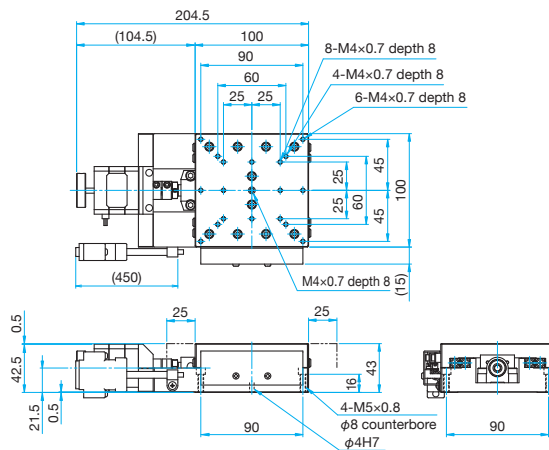
Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with proximity origin sensors.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

Compatible Controllers / Drivers and Cables



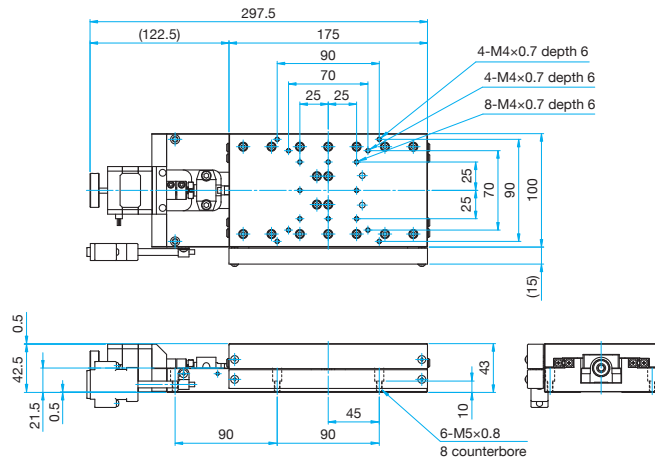
TAMM100-50C

Hexagon socket head cap screw M4x8...4 screws

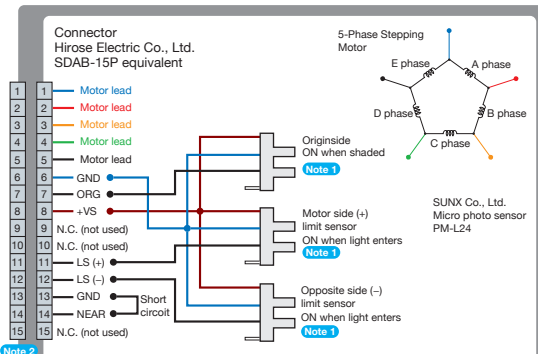


TAMM100-100C

Hexagon socket head cap screw M4x8...4 screws

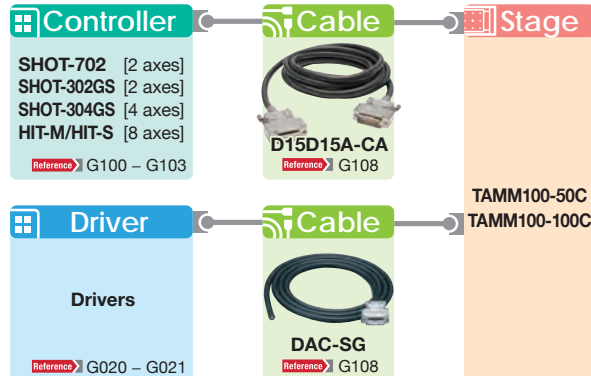


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with origin and proximity origin sensors.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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40mm

60mm

80mm

85mm

100mm

120mm

Others

Precision Motorized Stages - 5 Phase Stepping Motor

KST-X

RoHS

High precision X axis stages fitted with precision ball screws and precision crossed roller.



- Steel body offers excellent stiffness and high load capacity.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc. Or, use the motorized stage system question sheet.
Reference G111

Attention

- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications					
Part Number		KST-50X	KST-100X	KST-200X	
Mechanical Specifications	Travel [mm]	50	100	200	
	Table Size [mm]	165×165	165×200	165×360	
	Feed Screw	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 14mm, 2mm lead	
	Positioning Slide	Crossed roller	Crossed roller	Crossed roller	
	Stage Material	Steel (S50C)	Steel (S50C)	Steel (S50C)	
	Weight [kg]	8.6	10.2	20.0	
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	2	2	4
		(Half) [μ m/pulse]	1	1	2
	MAX Speed [mm/sec]	10	10	20	
	Positioning Accuracy [μ m]	5	7	8	
	Positional Repeatability [μ m]	2	2	2	
	Load Capacity [N]	392 (40.0kgf)	392 (40.0kgf)	392 (40.0kgf)	
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Yaw [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Roll [$^{\circ}$ /N·cm]	0.005	0.005	0.005
	Lost Motion [μ m]	1	1	1	
	Backlash [μ m]	1	1	1	
	Parallelism [μ m]	50	70	100	
	Running Parallelism [μ m]	10	10	20	
Pitch [$^{\circ}$] / Yaw [$^{\circ}$]	15/15	20/20	20/20		
Sensor	Sensor Part Number	Micro photo sensor: PM-L24 (SUNX Co., Ltd.): Limit sensor, origin sensor			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Proximity Origin Sensor	None	None	None	

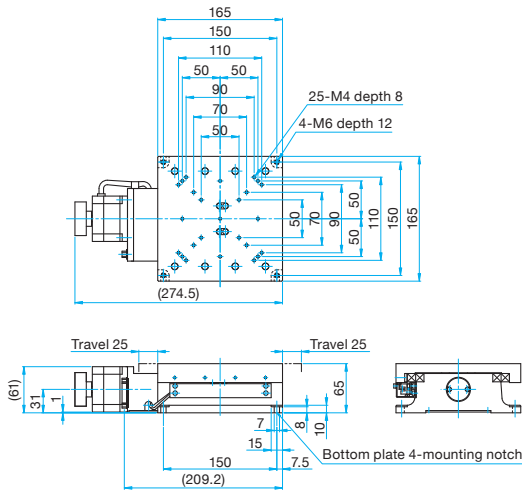
Motor / Sensor Specifications				
Motor	Type	5-phase stepping motor 1.4A/phase (Oriental Motor Co., Ltd.)		
	Motor Part Number	PK564-NBW (□60mm)	PK566-NBW (□60mm)	PK569-NBW (□60mm)
	Step Angle	0.72 $^{\circ}$		
Sensor	Power Voltage	DC5 - 24V \pm 10%		
	Current Consumption	45mA or lower (15mA or lower per sensor)		
	Control Output	NPN open collector output DC30V or lower, 50mA		
	Output Logic	When shaded: Output transistor OFF (no conduction)		

Compatible Driver / Controller		
Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, SG-5151, KR-525M
	Compatible Controller	SHOT-302GS, SHOT-304GS

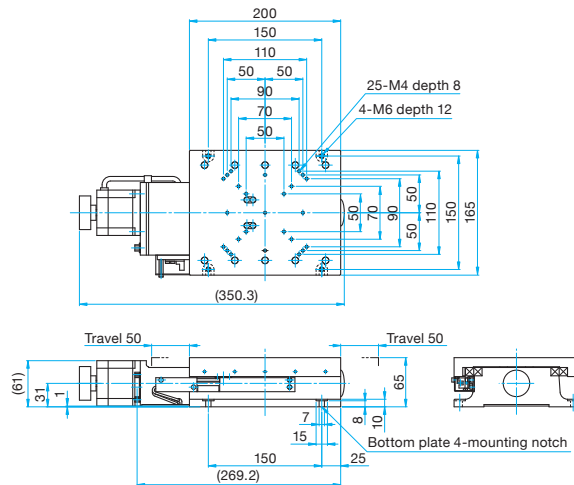


Outline Drawing

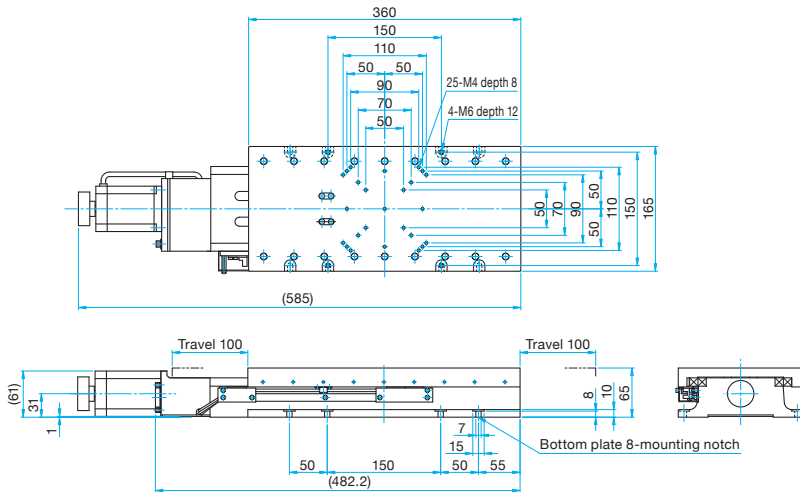
KST-50X Hexagon socket head cap screw M6×15...4 screws



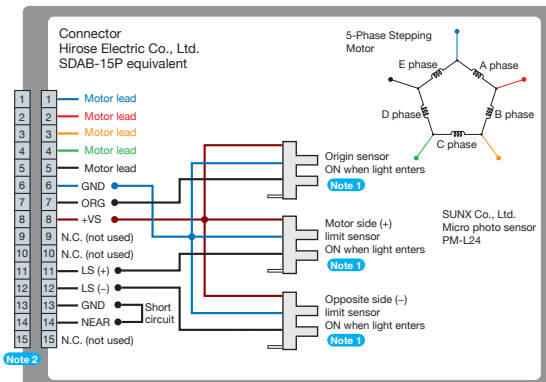
KST-100X Hexagon socket head cap screw M6×15...4 screws



KST-200X Hexagon socket head cap screw M6×15...8 screws

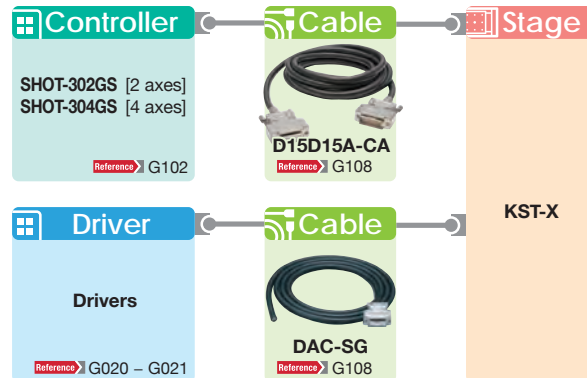


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
KST-50/100/200 is fitted with an origin sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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40mm

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80mm

85mm

100mm

120mm

Others

Precision Motorized Stages with built in Glass-scale Encoder

KST(GS) **RoHS**

Linear scales consist of “scales” used as a ruler and a “detector” which obtains positional information from the scales.



- Linear scales are used in indispensable processes in many fields, and mainly used in equipment for manufacturing electronic devices such as semiconductors, flat panel displays (FPD), and printed wiring boards, electronic component mounting machine, machine tools, and carrier machine.

Guide

- ▶ Theoretical resolution of the glass scale is set to 0.05 μ m.
- ▶ Contact our International Sales Division for resolutions not listed in the catalog.

Attention

- ▶ When operating the KST(GS) series with closed loop control, in order to use it within the specifications listed in the catalog, the number of motor divisions of the controller is recommended to be set to 100 or higher (travel per pulse is 0.05 μ m or less).

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications			KST(GS)-50X	KST(GS)-100X	KST(GS)-200X
Part Number					
Mechanical Specifications	Travel [mm]		50	100	200
	Table Size [mm]		165×165	165×200	165×360
	Feed Screw		Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 14mm, 2mm lead
	guide		Crossed roller guide	Crossed roller guide	Crossed roller guide
	Stage Material		Steel	Steel	Steel
	Weight [kg]		9.2	14.3	19.4
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	2	2	4
		(Half) [μ m/pulse]	1	1	2
	MAX Speed [mm/sec]		10	10	20
	Positioning Accuracy [μ m]		3	4	5
	Positional Repeatability [μ m]		0.5	0.5	0.8
	Load Capacity [N]		392 (40.0kgf)	392 (40.0kgf)	392 (40.0kgf)
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Yaw [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Roll [$^{\circ}$ /N·cm]	0.005	0.005	0.005
	Lost Motion [μ m]		0.5	0.5	0.5
	Backlash [μ m]		1	1	1
	Parallelism [μ m]		50	70	100
	Running Parallelism [μ m]		10	10	20
Pitch [$^{\circ}$] / Yaw [$^{\circ}$]		15/15	20/20	20/20	
Sensor	Sensor Part Number		Micro photo sensor: PM-L24 (SUNX Co.,Ltd.) Limit sensor, origin sensor		
	Limit Sensor		Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor		None	None	None
	Proximity Origin Sensor		None	None	None

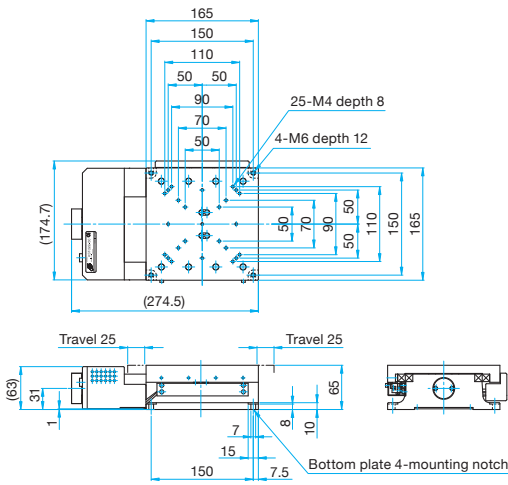
Motor Specifications				
Motor	Type	5-phase stepping motor 1.4A/phase (Oriental Motor Co., Ltd.)		
	Motor Part Number	PK564-NBW (□60mm)	PK566-NBW (□60mm)	PK569-NBW (□60mm)
	Step Angle	0.72 $^{\circ}$		

Compatible Controller	
Compatible Controller	SHOT-302GS, SHOT-304GS

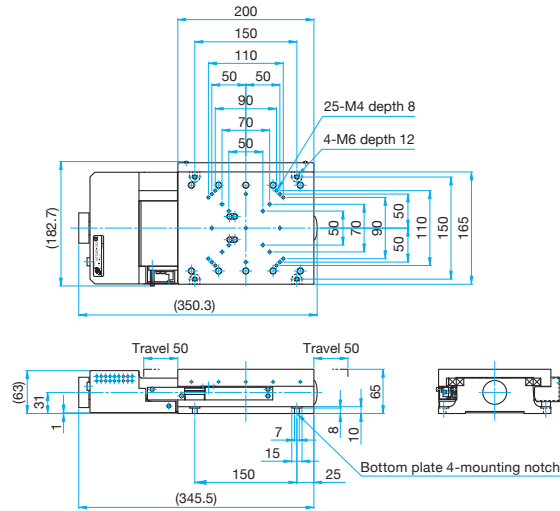


Outline Drawing

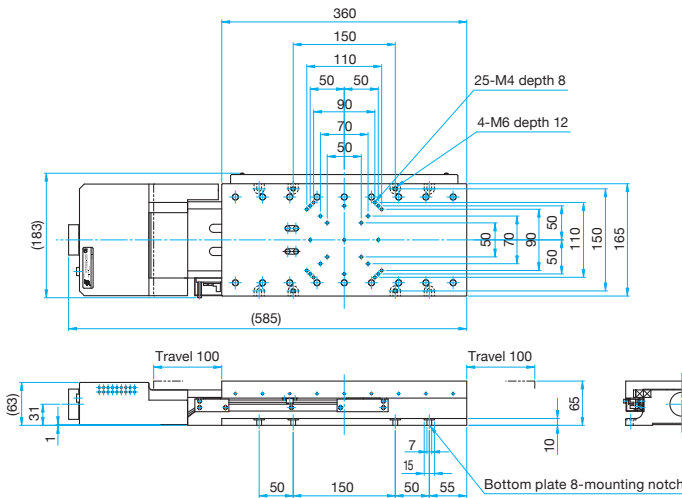
KST(GS)-50X Hexagon socket head cap screw M6×15...4 screws



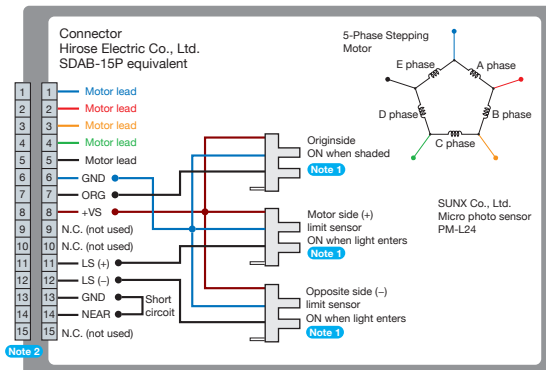
KST(GS)-100X Hexagon socket head cap screw M6×15...4 screws



KST(GS)-200X Hexagon socket head cap screw M6×15...8 screws

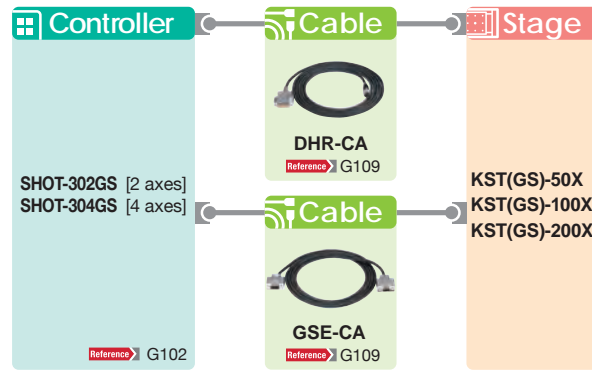


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. KST-50/100/200 is fitted with an origin sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

Compatible Controllers / Cables



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40mm

60mm

80mm

85mm

100mm

120mm

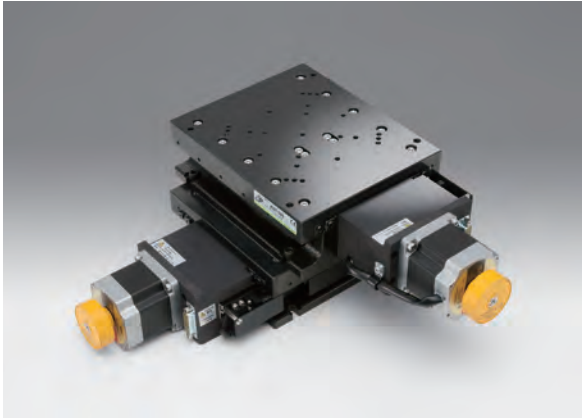
Others

Precision Motorized Stages - 5 Phase Stepping Motor

KST-XY

RoHS

High precision XY axis stages fitted with precision ball screws and precision crossed roller.



- Steel body offers excellent stiffness and high load capacity.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc. Or, use the motorized stage system question sheet. [Reference](#) G111
- ▶ We will assemble your X axis stage with a newly purchased X axis stage at a separate cost.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications			KST-50XY	KST-100XY	KST-200XY
Part Number					
Mechanical Specifications	Travel [mm]		50	100	200
	Table Size [mm]		165×165	165×200	165×360
	Feed Screw		Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 14mm, 2mm lead
	Positioning Slide		Crossed roller	Crossed roller	Crossed roller
	Stage Material		Steel (S50C)	Steel (S50C)	Steel (S50C)
	Weight [kg]		17.2	20.4	40.0
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	2	2	4
		(Half) [μ m/pulse]	1	1	2
	MAX Speed [mm/sec]		10	10	20
	Positioning Accuracy [μ m]		10	12	15
	Positional Repeatability [μ m]		2	2	2
	Load Capacity [N]		196 (20.0kgf)	196 (20.0kgf)	196 (20.0kgf)
	Lost Motion [μ m]		1	1	1
	Backlash [μ m]		1	1	1
	Orthogonality of Motion [μ m]		5	5	10
Sensor	Sensor Part Number				
	Micro photo sensor: PM-L24 (SUNX Co., Ltd.): Limit sensor, origin sensor				
	Limit Sensor		Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor		Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
Proximity Origin Sensor		None	None	None	

Motor / Sensor Specifications		
Motor	Type	5-phase stepping motor 1.4A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK564-NBW (□60mm) PK566-NBW (□60mm) PK569-NBW (□60mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 – 24V \pm 10%
	Current Consumption	45mA or lower (15mA or lower per sensor)
	Control Output	NPN open collector output DC30V or lower, 50mA
	Output Logic	When shaded: Output transistor OFF (no conduction)

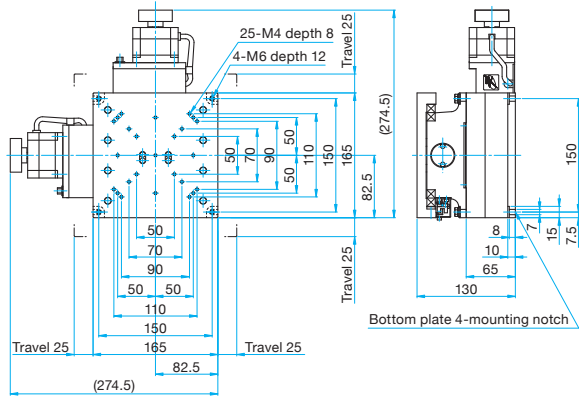
(Reference) Precision Specifications of Single Axis Stage			KST-50X	KST-100X	KST-200X
Part Number					
Accuracy Specifications	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Yaw [$^{\circ}$ /N·cm]	0.01	0.01	0.01
		Roll [$^{\circ}$ /N·cm]	0.005	0.005	0.005
	Parallelism [μ m]		50	70	100
	Running Parallelism [μ m]		10	10	20

Compatible Driver / Controller		
Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, SG-5151, KR-525M
	Compatible Controller	SHOT-302GS, SHOT-304GS

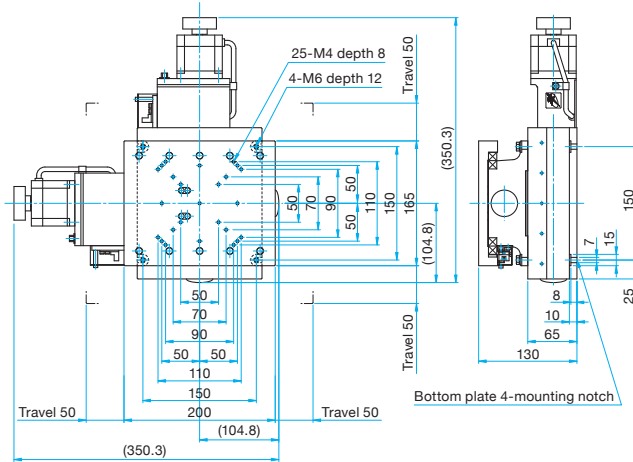


Outline Drawing

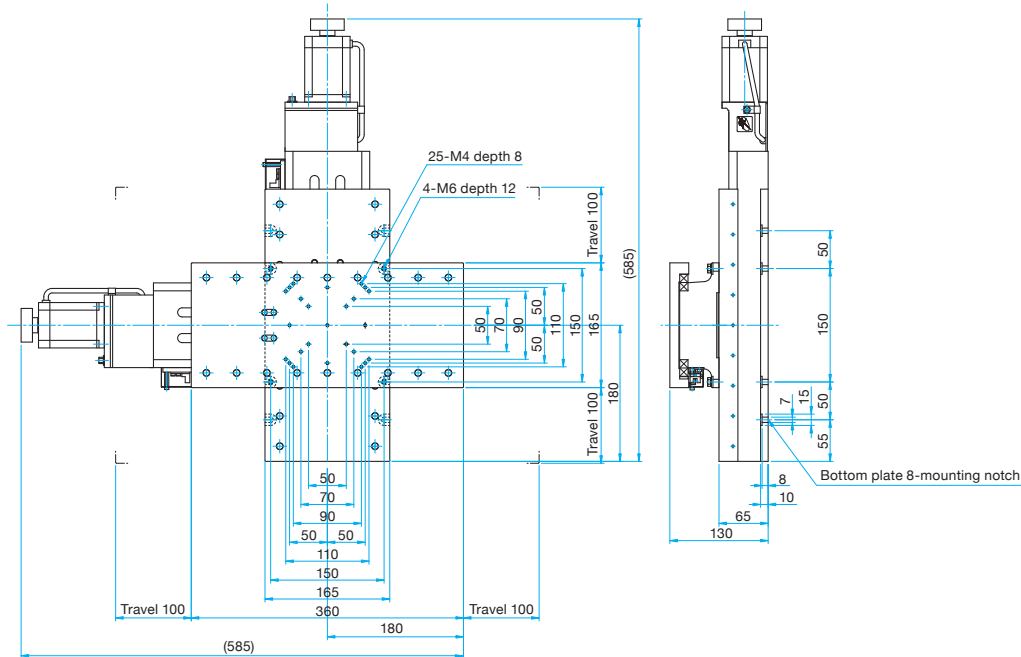
KST-50XY Hexagon socket head cap screw M6×15...4 screws



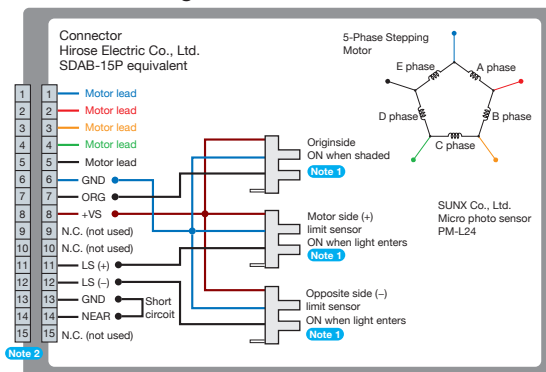
KST-100XY Hexagon socket head cap screw M6×15...4 screws



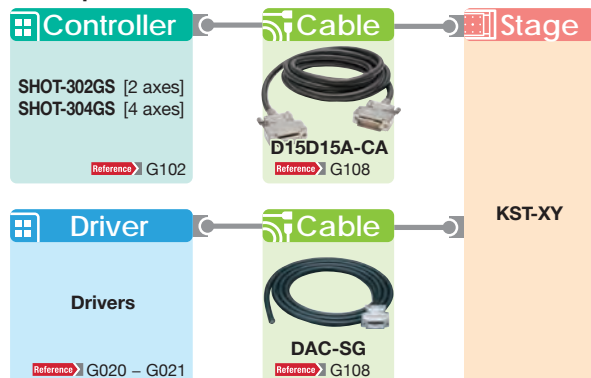
KST-200XY Hexagon socket head cap screw M6×15...8 screws



Connection Diagram



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40mm

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80mm

85mm

100mm

120mm

Others

Precision Motorized Stages - 5 Phase Stepping Motor

KST-Z

RoHS

High precision Z axis stages fitted with precision ball screws and precision crossed roller.



- Steel body offers excellent stiffness and high load capacity.

Guide

- ▶ Contact our International Sales Division if you desire to change motors, etc. Or, use the motorized stage system question sheet.

[Reference](#) G111

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 100mm

 120mm

Others

Specifications

Part Number		KST-50Z	KST-100Z	KST-200Z	
Mechanical Specifications	Travel [mm]	50	100	200	
	Table Size [mm]	165×165	165×200	165×360	
	Feed Screw	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 8mm, 1mm lead	Ball screw diameter ϕ 14mm, 2mm lead	
	Positioning Slide	Crossed roller	Crossed roller	Crossed roller	
	Stage Material	Steel (S50C)	Steel (S50C)	Steel (S50C)	
	Weight [kg]	12.8	14.5	27.0	
Accuracy Specifications	Resolution	(Full) [μ m/pulse]	2	2	4
		(Half) [μ m/pulse]	1	1	2
	MAX Speed [mm/sec]	10	10	20	
	Positioning Accuracy [μ m]	5	7	8	
	Positional Repeatability [μ m]	2	2	2	
	Load Capacity [N]	98 (10.0kgf)	98 (10.0kgf)	98 (10.0kgf)	
	Moment Stiffness	Pitch [$^{\circ}$ /N·cm]	0.015 (Y pitch)	0.020 (Y pitch)	0.030 (Y pitch)
		Yaw [$^{\circ}$ /N·cm]	0.01 (X pitch)	0.015 (X pitch)	0.020 (X pitch)
		Roll [$^{\circ}$ /N·cm]	0.005	0.015	0.015
	Lost Motion [μ m]	1	1	1	
	Backlash [μ m]	1	1	1	
	Perpendicularity of Motion [μ m]	10	15	25	
	Pitch [$^{\circ}$] / Yaw [$^{\circ}$]	20/15	25/20	25/25	
Sensor	Sensor Part Number	Micro photo sensor: PM-L24 (SUNX Co., Ltd.): Limit sensor, origin sensor			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 1.4A/phase (Oriental Motor Co., Ltd.)		
	Motor Part Number	PK564-NBW (□60mm)	PK566-NBW (□60mm)	PK569-NBW (□60mm)
	Step Angle	0.72°		
Sensor	Power Voltage	DC5 - 24V \pm 10%		
	Current Consumption	45mA or lower (15mA or lower per sensor)		
	Control Output	NPN open collector output DC30V or lower, 50mA		
	Output Logic	When shaded: Output transistor OFF (no conduction)		

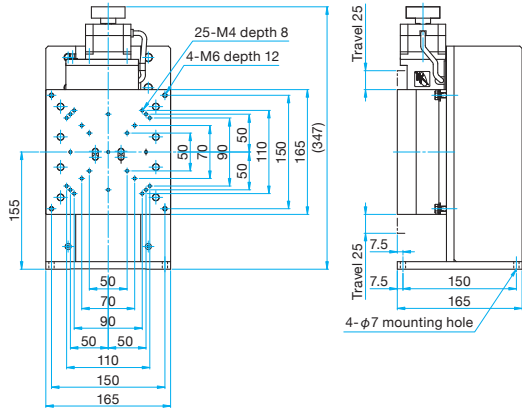
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, SG-5151, KR-525M
	Compatible Controller	SHOT-302GS, SHOT-304GS

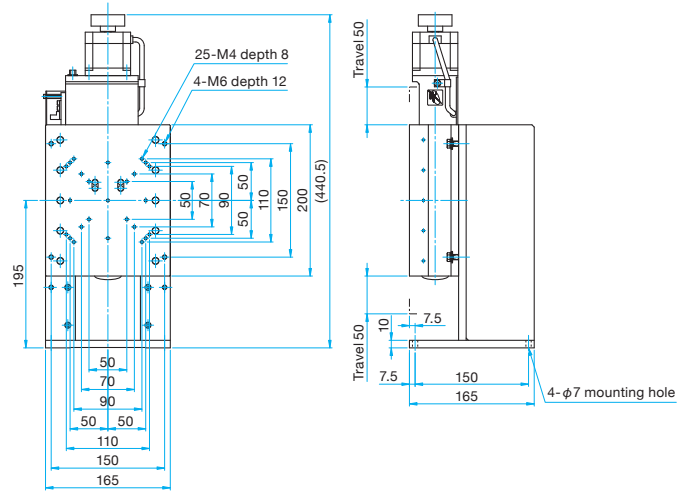


Outline Drawing

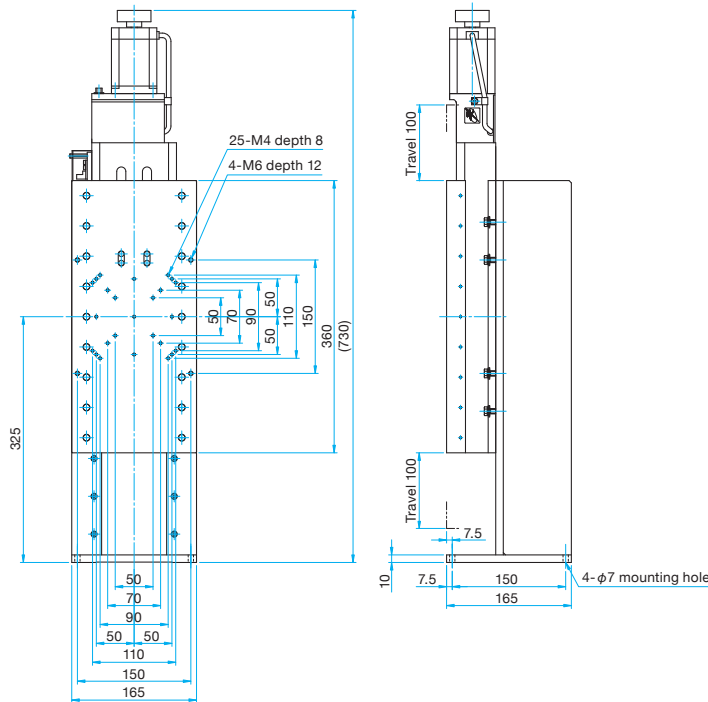
KST-50Z Hexagon socket head cap screw M6×20...4 screws



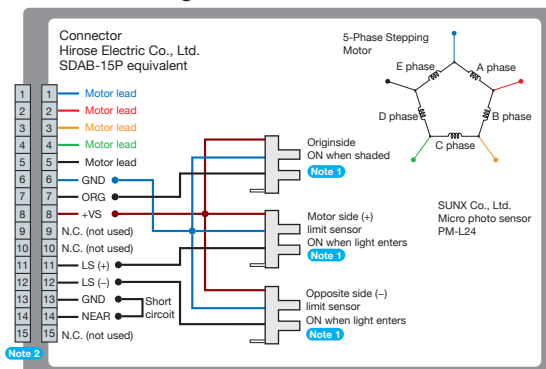
KST-100Z Hexagon socket head cap screw M6×20...4 screws



KST-200Z Hexagon socket head cap screw M6×20...4 screws

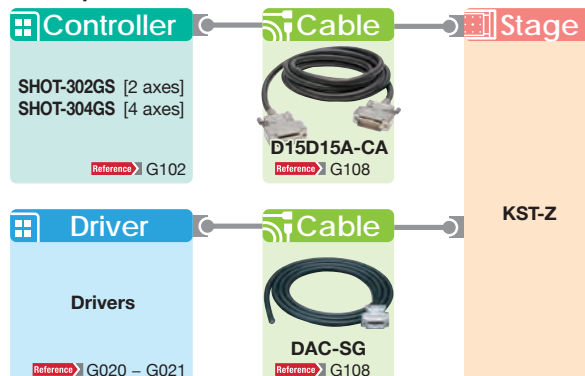


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
KST-50/100/200 is fitted with an origin sensor.
Note 2 Compatible cable connector: DDK Ltd. 17JE-13150

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Translation Motorized Stages, Flat Z axis - 5 Phase Stepping Motor | OSMS-ZF Stage size □40/□60/□80mm



Z axis stepping motor driven stages for measurement and inspection, offering high stiffness and high precision.

The table that travels up and down is horizontal and offers smooth travel.



- Originally designed horizontal plane Z axis stages in which a motor is incorporated in its main body for space-saving.
- Minimized protrusions make these stages ideal for system assembly

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□85mm

□100mm

□120mm

Others

Specifications			OSMS40-5ZF	OSMS60-5ZF	OSMS60-10ZF	OSMS80-20ZF
Part Number						
Mechanical Specifications	Travel [mm]		5	5	10	20
	Table Size [mm]		40×40	60×60	60×60	80×80
	Feed Screw		Ball screw diameter φ5mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ6mm, 1mm lead	Ball screw diameter φ8mm, 2mm lead
	Positioning Slide		Outer rail structure	Outer rail structure	Outer rail structure	Outer rail structure
	Stage Material		Aluminum	Aluminum	Aluminum	Aluminum
	Finish		Black anodized	Black anodized	Black anodized	Black anodized
	Weight [kg]		0.35	0.6	0.6	1.6
Accuracy Specifications	Resolution	(Full) [μm/pulse]	1.0	2.0	2.0	0.2
		(Half) [μm/pulse]	0.5	1.0	1.0	0.1
	MAX Speed [mm/sec]		2	4	4	1
	Positional Repeatability [μm]		10	10	10	10
	Load Capacity [N]		19.6 (2.0kgf)	39.2 (4.0kgf)	39.2 (4.0kgf)	147 (15.0kgf)
	Moment Stiffness	Pitch [°/N·cm]	2.0	0.4	0.4	0.2
		Yaw [°/N·cm]	2.0	1.0	1.0	1.0
		Roll [°/N·cm]	1.0	1.0	1.0	1.0
	Lost Motion [μm]		5	5	5	5
	Parallelism [μm]		50	50	50	50
	Running Parallelism [μm]		15	15	15	15
	Pitch [°]		25	20	20	25
	Sensor	Sensor Part Number		Micro photo sensor: GP1S097HCZ0F (Sharp Corporation): Limit Sensor (60-5ZF/60-10ZF) Micro photo sensor: PM-U24 (SUNX Co.,Ltd.): Limit Sensor (40-5ZF/80-20ZF)		
Limit Sensor		Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
Origin Sensor		None	None	None	None	
Proximity Origin Sensor		None	None	None	None	

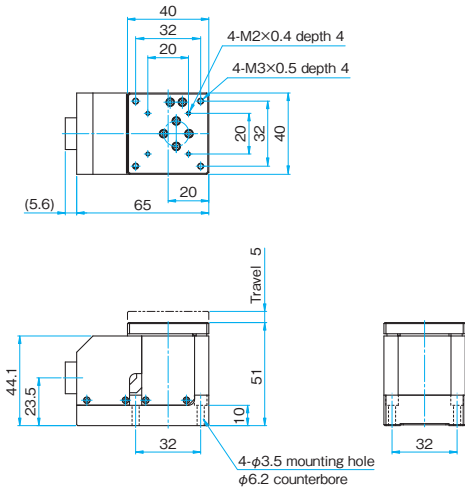
Motor / Sensor Specifications					
Motor	Type	5-phase stepping motor 0.35A/phase (Oriental Motor Co., Ltd.)		5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)	
	Motor Part Number	PK513PA-C21 (□20mm)	PK523HPB-C12 (□28mm)	PK523HPB-C12 (□28mm)	A7177-90215KTG (□28mm)
	Step Angle	0.72°			0.036°
Sensor	Power Voltage	DC5 – 24V ±10% or lower			
	Current Consumption	30mA or lower (15mA or lower per sensor)			
	Control Output	NPN open collector output DC30V or lower, 50mA or lower			
	Output Logic	When shaded: Output transistor OFF (no conduction)			

Compatible Driver / Controller				
Control System	Compatible Driver	SG-5MA, SG-55MA, SG-514MSC	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL	SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04		

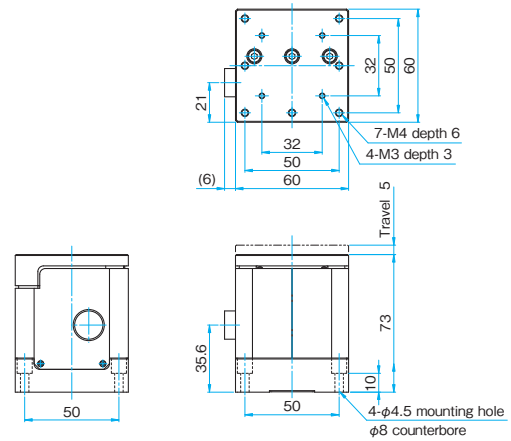


Outline Drawing

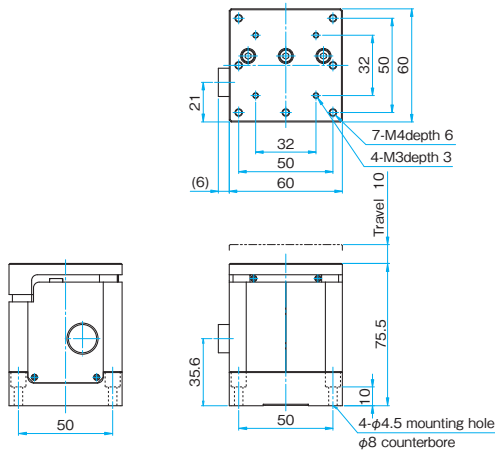
OSMS40-5ZF Hexagon socket head cap screw M3x15...4 screws



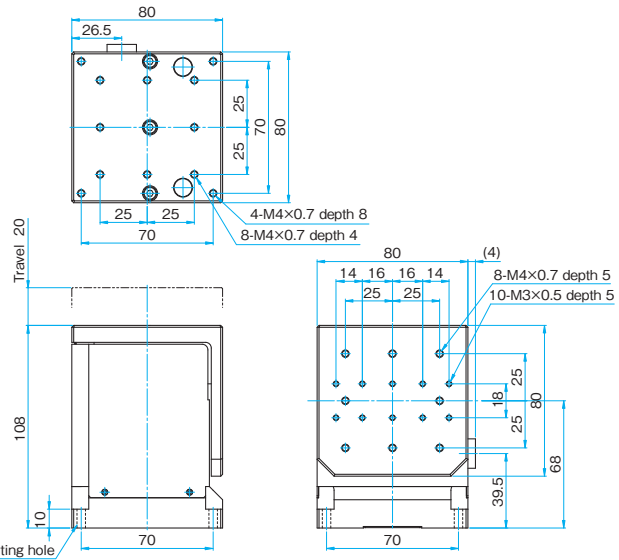
OSMS60-5ZF Hexagon socket head cap screw M4x15...4 screws



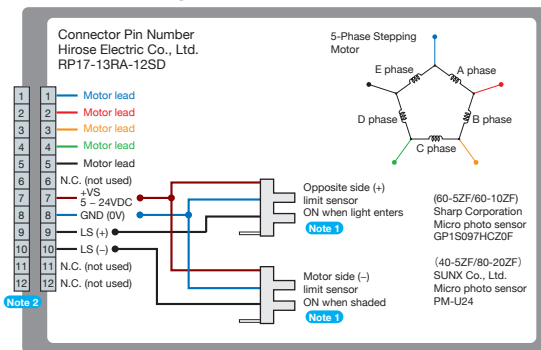
OSMS60-10ZF Hexagon socket head cap screw M4x15...4 screws



OSMS80-20ZF Hexagon socket head cap screw M4x15...4 screws

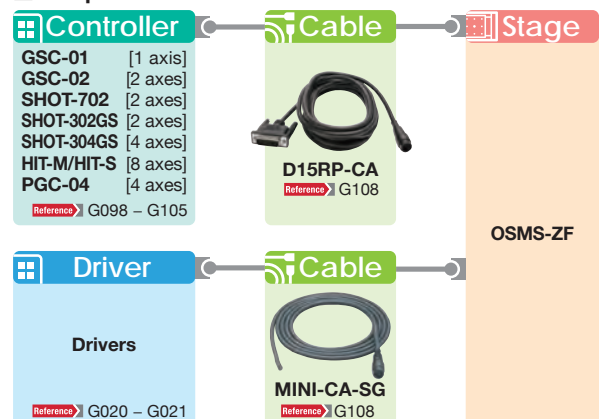


Connection Diagram



- Note 1** The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with proximity origin sensors. Limit sensors are used as origin detection sensors.
- Note 2** Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

Compatible Controllers / Drivers and Cables



* Adaptation SG-5MA, only SG-55MA is (0.35A/phase) OSMS40-5ZF

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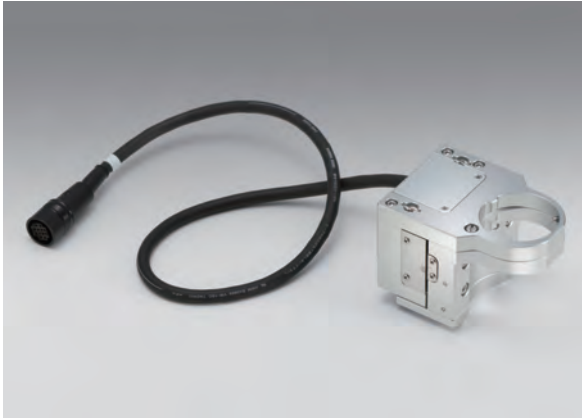
Others

Actuator for Objective Lenses (Stepper motor type)

SGSP-OBL

RoHS

Stepping motor type objective lens actuator compatible with long strokes.



- Since this actuator uses a stepping motor, it can be connected to our various controllers.
- It is compact and high resolution, best suited for incorporation into a microscope lens tube or an auto focus system.
- Can be used for upright type and inverted type microscopes.

Guide

- ▶ The dedicated adapters are available according to the microscope and screw size of objective lens of each manufacturer.

Attention

- ▶ The dedicated adapters are required for mounting the actuator on microscopes and objective lenses.

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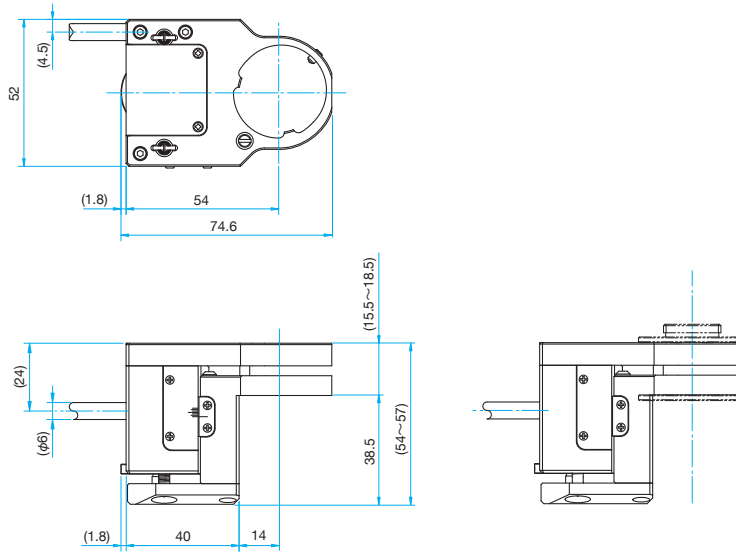
Others

Specifications		
Part Number		SGSP-OBL-3
Mechanical Specifications	Travel [mm]	3
	Table Size [mm]	(Mounted adapter)
	Feed Screw	Precision ground screw ϕ 6mm, 0.5mm lead
	Positioning Slide	Crossed roller guide
	Stage Material	Aluminum
	Finish	White anodized
	Weight [kg]	0.4
Accuracy Specifications	Resolution (Full) [μ m/pulse]	1
	(Half) [μ m/pulse]	0.5
	MAX Speed [mm/sec]	1
	Positioning Accuracy [μ m]	5
	Positional Repeatability [μ m]	2
	Load Capacity [N]	4.9 (0.5kgf)
	Moment Stiffness[$^{\circ}$ /N·cm]	—
	Lost Motion [μ m]	2
	Backlash [μ m]	1
	Parallelism [μ m]	—
	Running Parallelism [μ m]	2
Pitch [$^{\circ}$] / Yaw [$^{\circ}$]	15/15	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPI (Sharp Corporation)
	Limit Sensor	Equipped (NORMAL CLOSE)
	Origin Sensor	None
	Proximity Origin Sensor	None

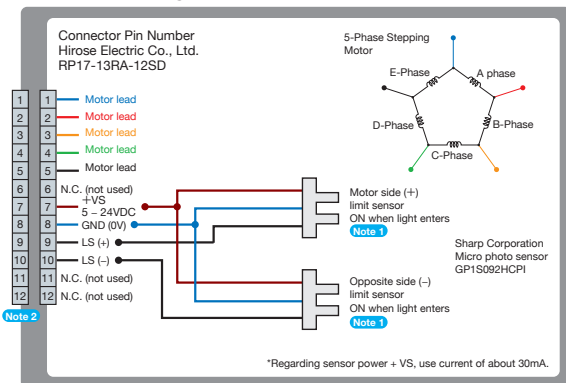
Motor / Sensor Specifications		
Motor	Type	5-phase stepping motor 0.35A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK513PA-C21 (□20mm)
	Step Angle	0.72 $^{\circ}$
Sensor	Power Voltage	DC - 5V - +24V \pm 10%
	Current Consumption	40mA or lower (20mA or lower per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	In the case of light shielded ,output transistor OFF (No conduction): Limit sensor

Compatible Driver / Controller		
Control System	Compatible Driver	SG-5MA, SG-55MA, SG-514MSC
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S

Outline Drawing



Connection Diagram

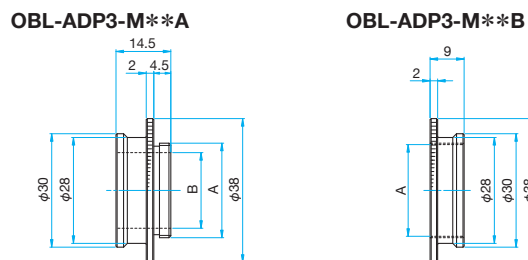


- Note 1** The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with proximity origin sensors. Limit sensors are used as origin detection sensors.
- Note 2** Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

Objective Lens Adapters



Outline Drawing



Specifications

Part Number	Mounting Screw Size [mm]	A [mm]	B [mm]
OBL-ADP3-M20.32A	Microscope side M20.32	M20.32 P=0.706 (W0.8x1/36)	15
OBL-ADP3-M20.32B	Objective lens side M20.32	M20.32 P=0.706 (W0.8x1/36)	—
OBL-ADP3-M25.0A	Microscope side M25.0	M25.0 P=0.75	20
OBL-ADP3-M25.0B	Objective lens side M25.0	M25.0 P=0.75	—
OBL-ADP3-M26.0A	Microscope side M26.0	M26.0 P=0.706 (W26.0x1/36)	21
OBL-ADP3-M26.0B	Objective lens side M26.0	M26.0 P=0.706 (W26.0x1/36)	—

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

Rotation Motorized Stages | SGSP-YAW



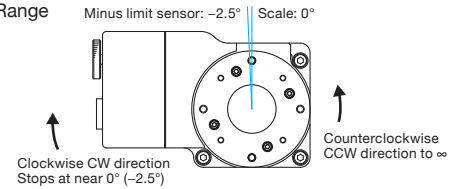
Stepping motor driven rotation stages fitted with bearing guide and worm gear feed mechanism.



- Motorized stages suitable for positioning for measuring, inspection and evaluation instruments.

Guide

▶ Rotation Range



- ▶ Homing of rotation motorized stages is performed using the CW limit sensor as the origin sensor.
- ▶ Origin detection is adjusted so that the stage stops at 0 degrees when homing is performed in the MINI system at half step.

Attention

- ▶ Attention is required when mounting in upside down direction or on a vertical plane.
- ▶ Precision and load capacity specifications may be partly not satisfied depending on the mounting direction.

Specifications

Part Number		SGSP-40YAW	SGSP-60YAW-0B	SGSP-60YAW-W-0B	
Mechanical Specifications	Rotation Range	Move in the counterclockwise CCW direction to ∞ , and stop at near 0 degree (-2.5°) in the clockwise CW direction.			
	Table Size [mm]	$\phi 40$	$\phi 60$	$\phi 60$	
	Travel Mechanism (reduction ratio)	Worm gear (1:144)	Worm gear (1:144)	Worm gear (1:144)	
	Positioning Slide	Bearing method	Bearing method	Bearing method	
	Stage Material	Aluminum / Aluminum bronze	Aluminum / Aluminum bronze	Aluminum / Aluminum bronze	
	Weight [kg]	0.35	0.45	1.0	
Accuracy Specifications	Resolution	(Full) [$^\circ$ /pulse]	0.005	0.005	0.005
		(Half) [$^\circ$ /pulse]	0.0025	0.0025	0.0025
	MAX Speed [$^\circ$ /sec]	30	30	30	
	Positioning Accuracy [$^\circ$]	0.1	0.1	—	
	Positional Repeatability [$^\circ$]	0.02	0.02	0.02	
	Load Capacity [N]	19.6 (2.0kgf)	29.4 (3.0kgf)	29.4 (3.0kgf)	
	Moment Stiffness [$^\circ$ /N-cm]	2	1	—	
	Lost Motion [$^\circ$]	0.05	0.05	0.05	
	Backlash [$^\circ$]	0.1	0.1	0.1	
	Parallelism [μ m]	50	50	—	
	Concentricity [μ m]	30	30	—	
Wobble [mm]	0.02	0.02	—		
Sensor	Sensor Part Number	Micro Photoelectric Sensor: PM-F24 (SUNX Co., Ltd.)	Micro Photoelectric Sensor: PM-R24 (SUNX Co., Ltd.)	Micro Photoelectric Sensor: PM-R24 (SUNX Co., Ltd.)	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	None	None	None	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.66A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3664N4 ($\square 24$ mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V $\pm 10\%$
	Current Consumption	15mA or lower
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514M5C, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

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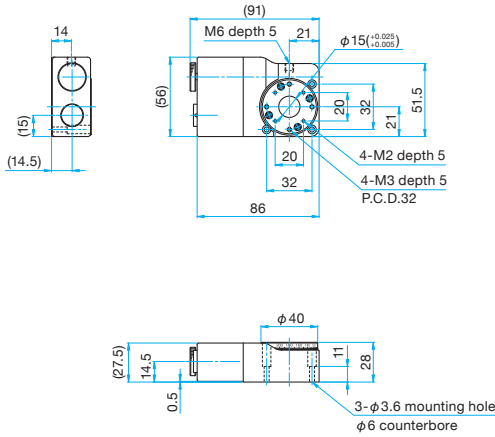
 40mm 60mm 80mm 85mm 100mm 120mm

Others

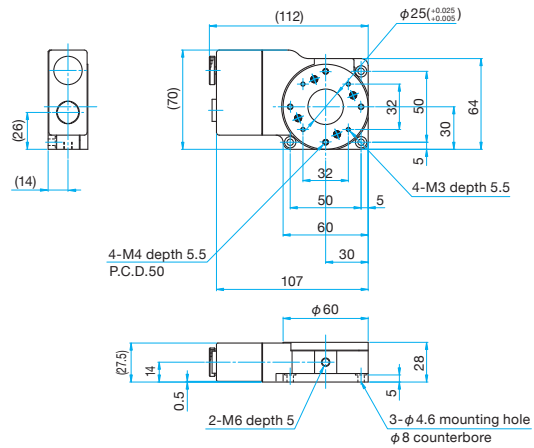


Outline Drawing

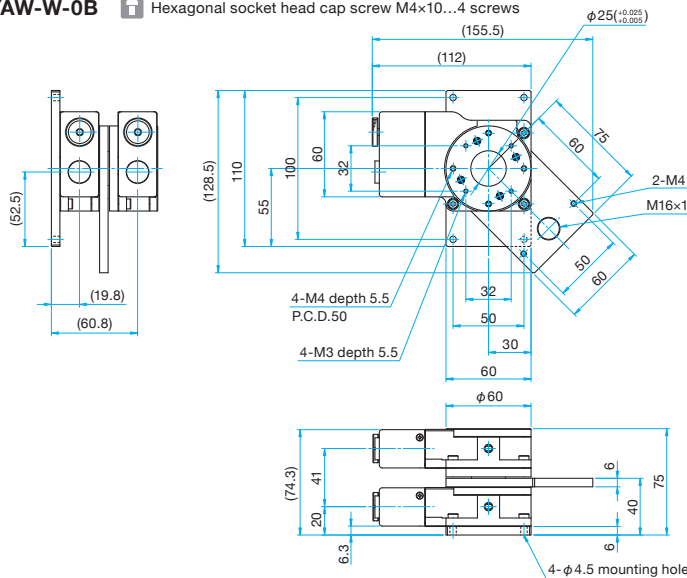
SGSP-40YAW Hexagonal socket head cap screw M3x15...3 screws



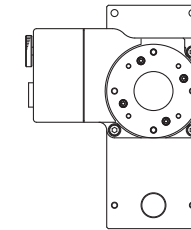
SGSP-60YAW-0B Hexagonal socket head cap screw M4x10...3 screws



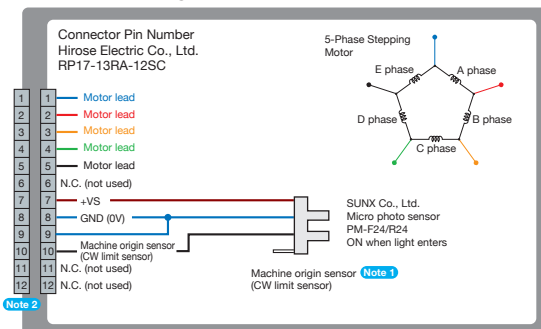
SGSP-60YAW-W-0B Hexagonal socket head cap screw M4x10...4 screws



When homing of SGSP-60YAW-W-0B is performed, the position will become as shown below.



Connection Diagram



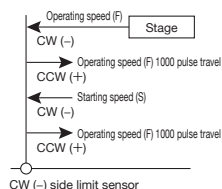
Note 1 When a travel command in the "+" direction is issued, the mounting table rotates to ∞ in the CCW (counterclockwise) direction viewed from the top surface, but it is stopped by the machine origin sensor (CW limit sensor) in the CW (clockwise) direction. Detect the machine origin using the method (MINI system) that detects the origin with a machine origin sensor (CW limit sensor).

Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

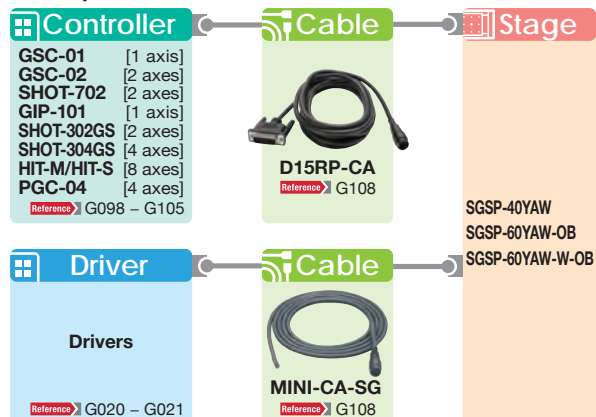
Machine Origin Detection

MINI System

When the machine origin detection command is issued, the stage starts traveling in the CW (-) direction at the operating speed (F) set with the memory switch, and stops by the CW (-) side limit sensor. Then it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. After stop, it starts traveling in the CW (-) direction again at the starting speed (S), and stops by the CW (-) side limit sensor. After that, it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. This position is regarded as the machine origin.



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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Rotation Motorized Stages | SGSP-YAW



Stepping motor driven rotation stages fitted with bearing guide and worm gear feed mechanism.

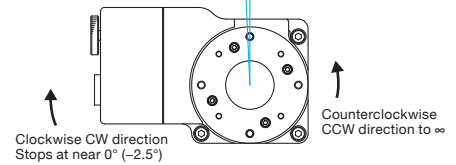


- Motorized stages suitable for positioning for measuring, inspection and evaluation instruments.

Guide

▶ Rotation Range

Minus limit sensor : -2.5° | Scale : 0°



- ▶ Homing of rotation motorized stages is performed using the CW limit sensor as the origin sensor.
- ▶ Origin detection is adjusted so that the stage stops at 0 degrees when homing is performed in the MINI system at half step.

Attention

- ▶ Attention is required when mounting in upside down direction or on a vertical plane.
- ▶ Precision and load capacity specifications may be partly not satisfied depending on the mounting direction.

Specifications						
Part Number		SGSP-80YAW	SGSP-120YAW	SGSP-160YAW	SGSP-120YAW-W	
Guide	Rotation Range	Move in the counterclockwise CCW direction to ∞ , and stop at near 0 degree (-2.5°) in the clockwise CW direction.				
	Table Size [mm]	$\phi 80$	$\phi 120$	$\phi 160$	$\phi 120$	
	Travel Mechanism (reduction ratio)	Worm gear (1:144)	Worm gear (1:144)	Worm gear (1:144)	Worm gear (1:144)	
	Positioning Slide	Bearing method	Crossed roller	Crossed roller	Crossed roller	
	Stage Material	Aluminum / Aluminum bronze	Aluminum / Aluminum bronze	Aluminum / Aluminum bronze	Aluminum / Aluminum bronze	
	Weight [kg]	1.1	2.0	2.5	5.5	
Accuracy Specifications	Resolution	(Full) [$^\circ$ /pulse]	0.005	0.005	0.005	0.005
		(Half) [$^\circ$ /pulse]	0.0025	0.0025	0.0025	0.0025
	MAX Speed [$^\circ$ /sec]	30	30	30	30	
	Positioning Accuracy [$^\circ$]	0.15	0.1	0.1	—	
	Positional Repeatability [$^\circ$]	0.02	0.02	0.02	0.02	
	Load Capacity [N]	98 (10.0kgf)	196 (20.0kgf)	196 (20.0kgf)	196 (20.0kgf)	
	Moment Stiffness [$^\circ$ /N·cm]	0.2	0.1	0.1	—	
	Lost Motion [$^\circ$]	0.05	0.05	0.05	—	
	Backlash [$^\circ$]	0.08	0.08	0.08	0.08	
	Parallelism [μ m]	50	50	60	—	
	Concentricity [μ m]	30	30	30	—	
	Wobble [mm]	0.02	0.02	0.02	—	
Sensor	Sensor Part Number	Micro Photoelectric Sensor: PM-F24 (SUNX Co., Ltd.)				
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	None	None	None	None	
	Proximity Origin Sensor	None	None	None	None	

Motor / Sensor Specifications		
Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK525HPB-C4 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 – 24V $\pm 10\%$
	Current Consumption	15mA or lower
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF (no conduction)

Compatible Driver / Controller		
Control System	Compatible Driver	SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M-HIT-S, PGC-04

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□40mm

□60mm

□80mm

□85mm

□100mm

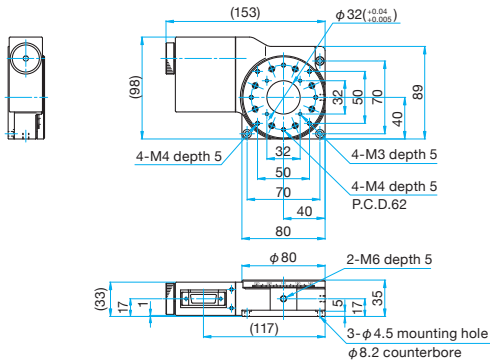
□120mm

Others

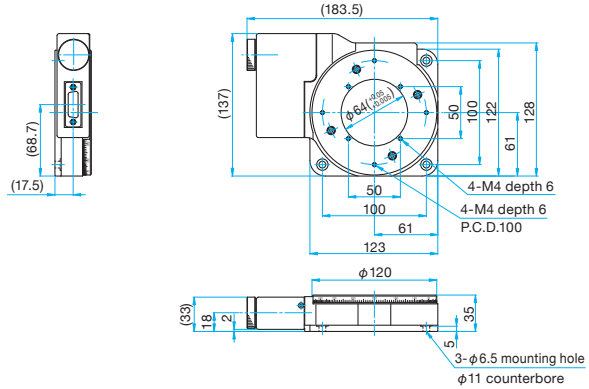


Outline Drawing

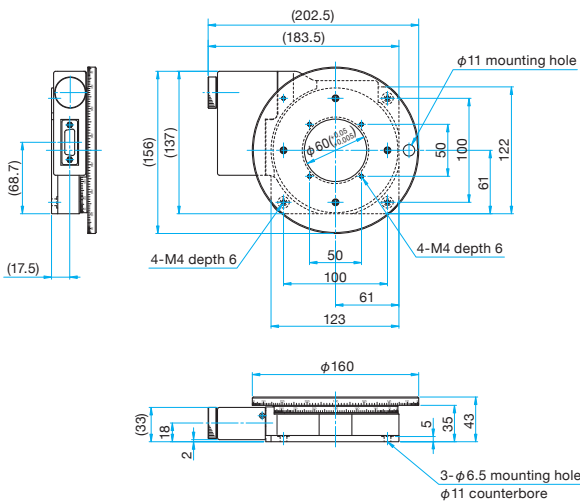
SGSP-80YAW Hexagonal socket head cap screw M4×10...3 screws



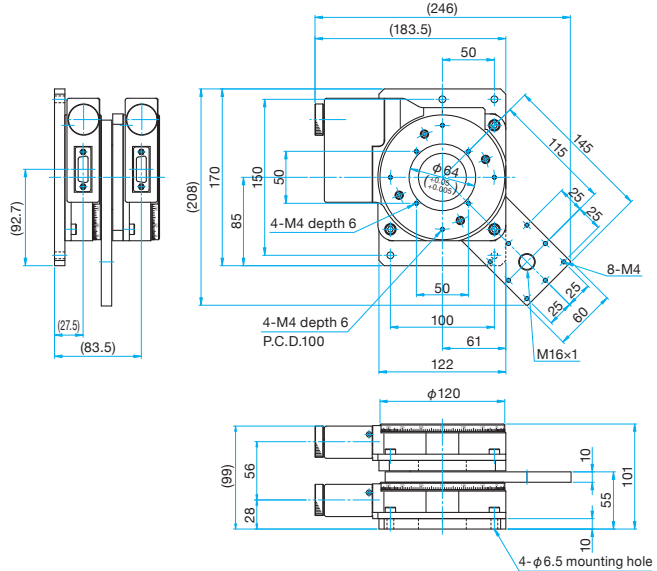
SGSP-120YAW Hexagon socket head cap screw M6×10...3 screws



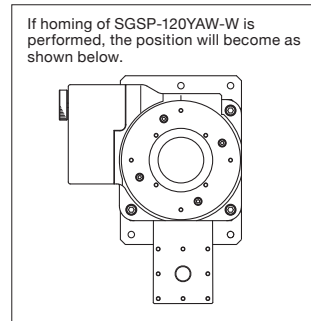
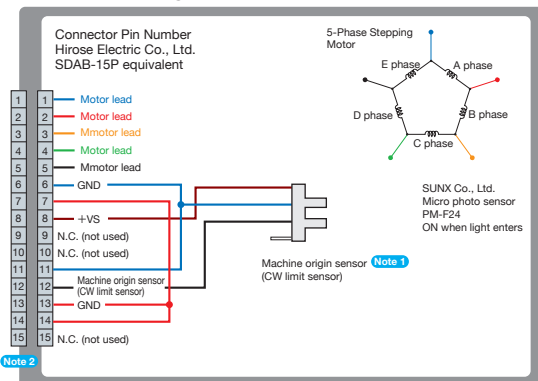
SGSP-160YAW Hexagon socket head cap screw M6×10...3 screws



SGSP-120YAW-W Hexagon socket head cap screw M6×18...3 screws



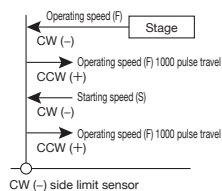
Connection Diagram



- Note 1** When a travel command in the "+" direction is issued, the mounting table rotates to ∞ in the CCW (counterclockwise) direction viewed from the top surface, but it is stopped by the machine origin sensor (CW limit sensor) in the CW (clockwise) direction. Detect the machine origin using the method (MINI system) that detects the origin with a machine origin sensor (CW limit sensor).
- Note 2** Compatible cable connector: DDK Ltd. 17JE-13150

Machine Origin Detection

MINI System
When the machine origin detection command is issued, the stage starts traveling in the CW (-) direction at the operating speed (F) set with the memory switch, and stops by the CW (-) side limit sensor. Then it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. After stop, it starts traveling in the CW (-) direction again at the starting speed (S), and stops by the CW (-) side limit sensor. After that, it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. This position is regarded as the machine origin.



Compatible Controllers / Drivers and Cables

Controller	Cable	Stage
<ul style="list-style-type: none"> SHOT-702 [2 axes] GIP-101 [1 axis] SHOT-302GS [2 axes] SHOT-304GS [4 axes] HIT-M/HIT-S [8 axes] PGC-04 [4 axes] Reference: G088 - G096	D15D15A-CA Reference: G108	<ul style="list-style-type: none"> SGSP-80YAW SGSP-120YAW SGSP-160YAW SGSP-120YAW-W
<ul style="list-style-type: none"> Drivers Reference: G020 - G021	DAC-SG Reference: G108	

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

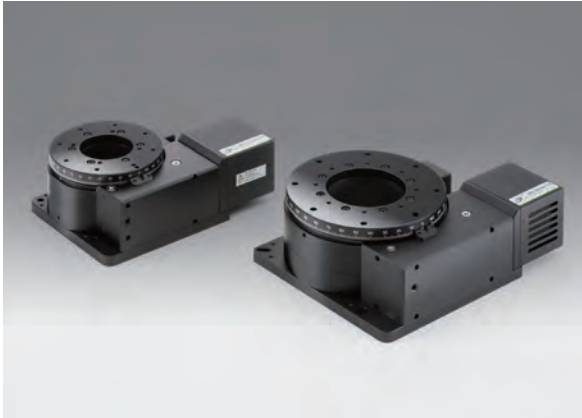
Precision Rotation Motorized Stages

KST-YAW

RoHS

CE

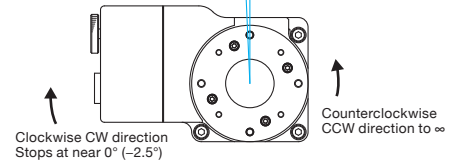
High precision and high stability rotation motorized stages fitted with bearing positioning slide.



- Rotation motorized stages suitable for when high load capacity is required.
- Back up various inspection instruments according to usage such as the type, size, and measurement range of the measuring object.

Guide

▶ Rotation Range

Minus limit sensor: -2.5° | Scale: 0° 

- ▶ Homing of rotation motorized stages is performed using the CW limit sensor as the origin sensor.
- ▶ Origin detection is adjusted so that the stage stops at 0 degrees when homing is performed in the MINI system at half step.

Attention

- ▶ Attention is required when mounting in upside down direction or on a vertical plane.
- ▶ Precision and load capacity specifications may be partly not satisfied depending on the mounting direction.

Specifications

Part Number		KST-120YAW	KST-160YAW	
Mechanical Specifications	Rotation Range	Move in the counterclockwise CCW direction to ∞ , and stop at near 0 degree (-2.5°) in the clockwise CW direction.		
	Table Size [mm]	$\phi 120$	$\phi 160$	
	Travel Mechanism (reduction ratio)	Worm gear (1:144)		
	Positioning Slide	Bearing method		
	Stage Material	Aluminum / Aluminum bronze		
	Weight [kg]	5	8.5	
Accuracy Specifications	Resolution	(Full) [$^\circ$ /pulse]	0.005	0.005
		(Half) [$^\circ$ /pulse]	0.0025	0.0025
	MAX Speed [$^\circ$ /sec]	30	30	
	Positioning Accuracy [$^\circ$]	0.1	0.1	
	Positional Repeatability [$^\circ$]	0.01	0.01	
	Load Capacity [N]	343 (35.0kgf)	392 (40.0kgf)	
	Moment Stiffness [$^\circ$ /N·cm]	0.015	0.01	
	Lost Motion [$^\circ$]	0.01	0.01	
	Backlash [$^\circ$]	0.003	0.003	
	Parallelism [μ m]	50	50	
	Concentricity [μ m]	20	20	
	Wobble [mm]	0.01	0.01	
Sensor	Sensor Part Number	Micro Photoelectric Sensor: PM-U24 (SUNX Co., Ltd.)	Micro Photo Sensor: PM-R24 (SUNX Co., Ltd.)	
	Limit Sensor	Equipped (NORMAL CLOSE)		
	Origin Sensor	None		
	Proximity Origin Sensor	None		

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 1.4A/phase (Tamagawa Seiki Co., Ltd.)
	Motor Part Number	TS3624N42E ($\square 60$ mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V $\pm 10\%$
	Current Consumption	15mA or lower
	Control Output	NPN open collector output DC30V or lower, 50mA or lower
	Output Logic	When shaded: Output transistor OFF

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M*, SG-55M*, SG-514MSC*, MC-7514PCL (* DC36V)
	Compatible Controller	SHOT-302GS, SHOT-304GS

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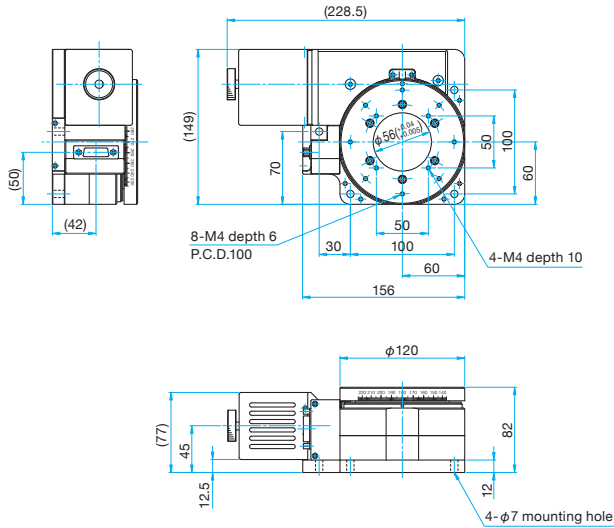
 40mm 60mm 80mm 85mm 100mm 120mm

Others

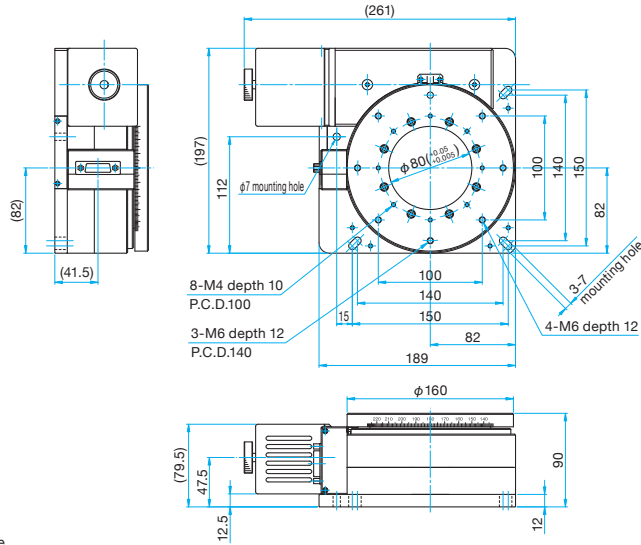


Outline Drawing

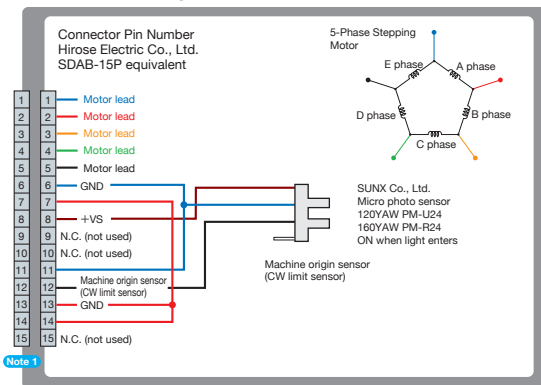
KST-120YAW Hexagon socket head cap screw M6×15...4 screws



KST-160YAW Hexagon socket head cap screw M6×25...4 screws



Connection Diagram

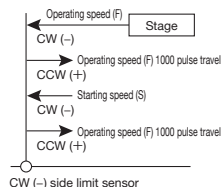


Note 1 Compatible cable connector: DDK Ltd. 17JE-13150

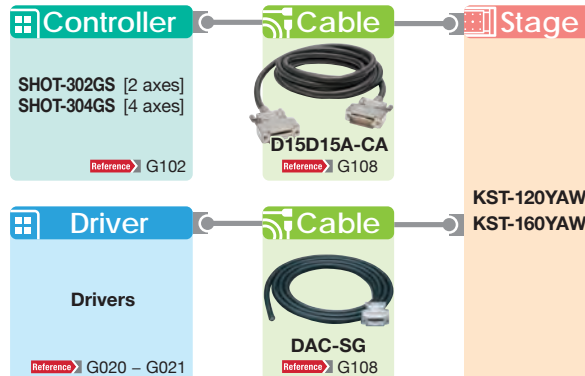
Machine Origin Detection

MINI System

When the machine origin detection command is issued, the stage starts traveling in the CW (-) direction at the operating speed (F) set with the memory switch, and stops by the CW (-) side limit sensor. Then it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. After stop, it starts traveling in the CW (-) direction again at the starting speed (S), and stops by the CW (-) side limit sensor. After that, it travels in the CCW (+) direction at the operating speed (F) for 1000 pulses. This position is regarded as the machine origin.



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- 40mm
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- 100mm
- 120mm

Others

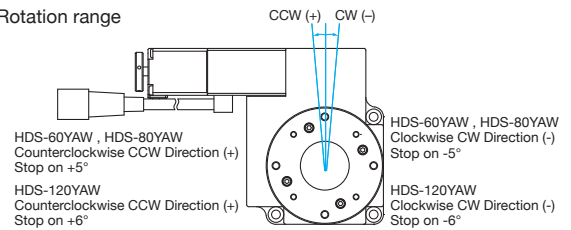
It is a small angle adjusting automatic rotation stages using in the alignments for a marker of semiconductor wafer.

- Good for the automatic alignment device which needs for adjusting the small angle of rotation by each sample.
- By using the ball screw system on the drive mechanism, it can reduce abrasion and backlash of parts which realized high durability.
- Since it converted linear motion by the ball screw into rotational motion by the steel belt, there is no difference between traveling center and end by rotation speed and resolution.



Guide

▶ Rotation range



Attention

- ▶ Please be mounted HDS series in horizontal. Can not be guaranteed the performance if used in reversion on the roof or vertically situation. If you would like a special mounting, please contact our sales department.

Specifications

Part Number		HDS-60YAW	HDS-80YAW	HDS-120YAW	
Mechanical Specifications	Rotation Range	±5°	±5°	±6°	
	Table Size [mm]	φ60	φ80	φ120	
	Travel Mechanism	Ball screw with steel belt	Ball screw with steel belt	Ball screw with steel belt	
	Positioning Slide	Bearing method	Bearing method	Crossed roller guide	
	Stage Material	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	
	Weight [kg]	0.5	0.9	1.4	
Accuracy Specifications	Resolution	(Full) [°/pulse]	≒0.00053	≒0.00038	≒0.00022
		(Half) [°/pulse]	≒0.00027	≒0.00019	≒0.00011
	MAX Speed [°/sec]	60	60	60	
	Positioning Accuracy [°]	0.05	0.05	0.05	
	Positional Repeatability [°]	0.003	0.003	0.003	
	Load Capacity [N]	29.4 (3.0kgf)	58.8 (3.0kgf)	98 (10kgf)	
	Moment Stiffness [°/N·cm]	1	0.2	0.1	
	Lost Motion [°]	0.003	0.003	0.003	
	Backlash [°]	0.05	0.05	0.05	
	Parallelism [μm]	50	50	50	
	Concentricity [μm]	10	10	10	
Wobble [mm]	0.01	0.01	0.01		
Sensor	Sensor Part Number	Micro photo sensor: GP1S097HCZ(Sharp Corporation)			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.66A/phase (Tamagawa Seiki Co., Ltd.)	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	TS3664N4 (□24mm)	C9863-90215P (□28mm)
	Step Angle	0.72°	
Sensor	Power Voltage	DC5 - 24V±10%	
	Current Consumption	60mA or lower (20mA per sensor)	
	Control Output	NPN open collector output DC30V or lower, 50mA or lower	
	Output Logic	"When shaded: Output transistor OFF (no conduction): Limit sensor When shaded: Output transistor ON (conduction): Origin sensor"	

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC
	Compatible Controller	GSC-01, GIP-101, GSC-02, SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

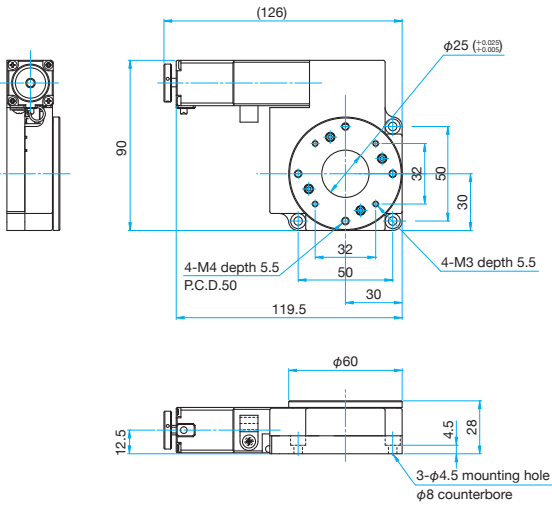
□120mm

Others

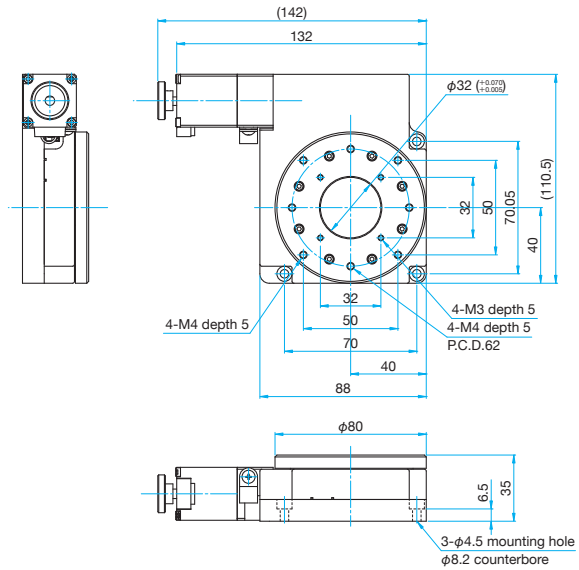


Outline Drawing

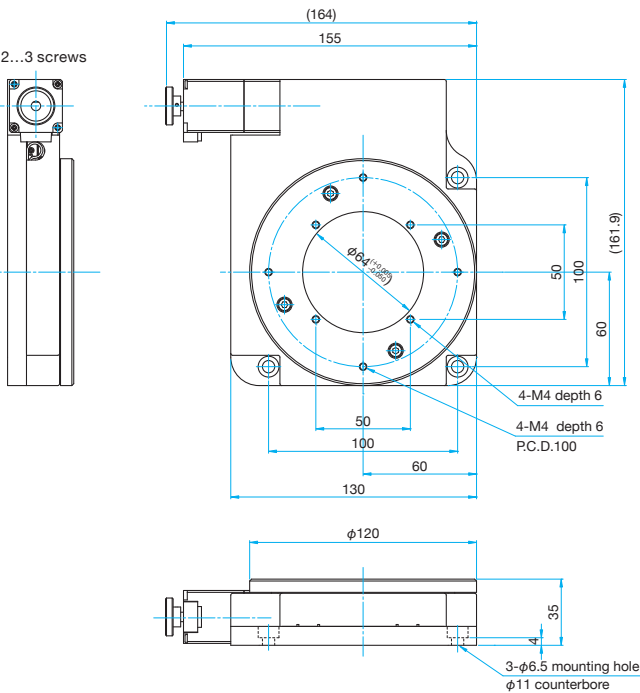
HDS-60YAW Hexagon socket head cap screw M4×12...3 screws



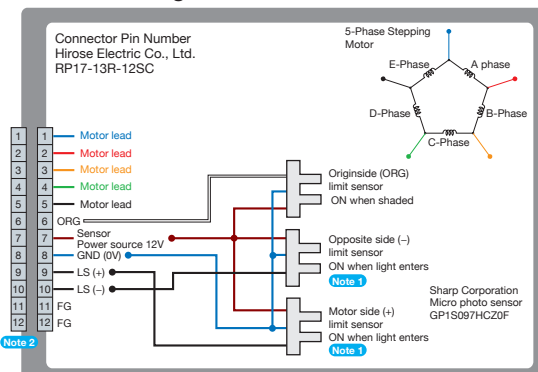
HDS-80YAW Hexagon socket head cap screw M4×12...3 screws



HDS-120YAW Hexagon socket head cap screw M6×12...3 screws

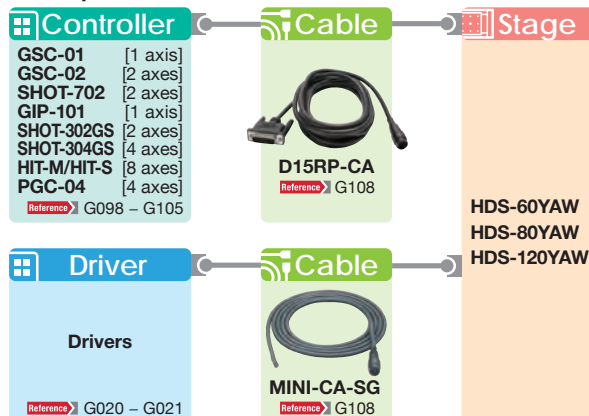


Connection Diagram



Note 1 The motor side limit sensor is the (+) forward direction limit sensor.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

Compatible Controllers / Drivers and Cables



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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Motorized Extended Guide Goniometer

OSMS-40A Stage size □40mm

RoHS

CE

High precision motorized goniometers with integrated bearing ways for superior stiffness, accuracy and durability.

Their smooth movement is ideal for frequent angle adjustment.

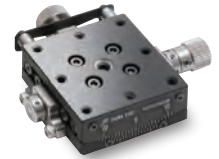


- Cost-effective motorized stages achieved by integrated structure in which guides are directly processed on the main body to reduce the number of parts and assembly time.
- Attachment pins (accessories) are ideal for positioning when assembling into $\alpha\beta$ axis or mounting on various instruments or devices.

Guide

- ▶ Contact our International Sales Division if you desire to assemble into an $\alpha\beta$ axis stage.
- ▶ Contact our International Sales Division if you desire a rotation center height not listed in the catalog.
- ▶ Manual type (GOHT-40) is also available.

[Reference](#) ▶ E168



GOHT-40

Specifications

Part Number		OSMS-40A60	OSMS-40A75	
(Opposite Model)		OSMS-40A60R	OSMS-40A75R	
Mechanical Specifications	Travel [°]	±5	±4	
	Table Size [mm]	40×40	40×40	
	Travel Mechanism (reduction ratio)	Worm gear (1: 332)	Worm gear (1: 406)	
	Positioning Slide	Extended Contact Ball Guide	Extended Contact Ball Guide	
	Stage Material	SUS440C quench hardened	SUS440C quench hardened	
	Finish	Super black chrome	Super black chrome	
	Weight [kg]	0.4	0.4	
Size Tolerance	Stage Height [mm]	15	15	
	Rotation Center Height [mm]	60±0.1	75±0.1	
	Rotation Center Deflection Accuracy [mm]	Within φ0.01	Within φ0.01	
Accuracy Specifications	Resolution	(Full) [°/pulse]	about 0.00217	about 0.00177
		(Half) [°/pulse]	about 0.00108	about 0.00089
	MAX Speed [°/sec]	10	8.9	
	Positional Repeatability [°]	±0.004	±0.004	
	Load Capacity [N]	19.6(2.0kgf)	19.6(2.0kgf)	
	Moment Stiffness [°/N·cm]	Roll 0.6 Yaw 0.6	Roll 0.6 Yaw 0.6	
	Lost Motion [°]	0.02	0.02	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPIF(Sharp Corporation): Limit Sensor		
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK523HPB-C12 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC - 5V - +24V
	Current Consumption	40mA or lower (20mA per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	When shaded: Output transistor OFF (no conduction)

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

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□40mm

□60mm

□80mm

□85mm

□100mm

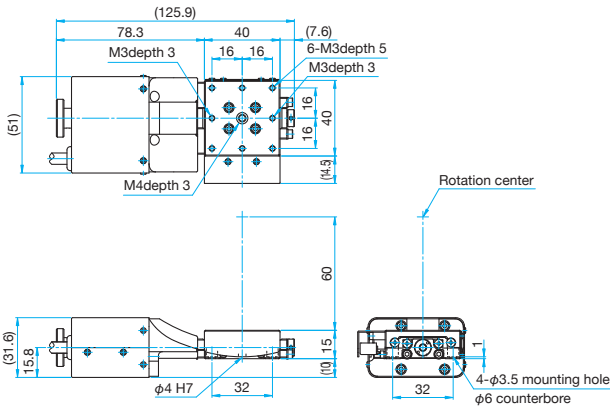
□120mm

Others

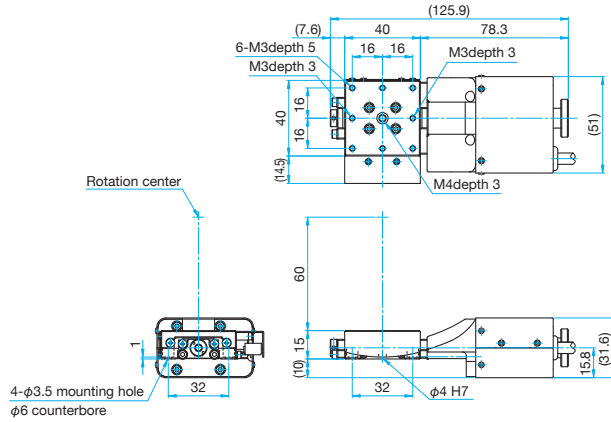


Outline Drawing

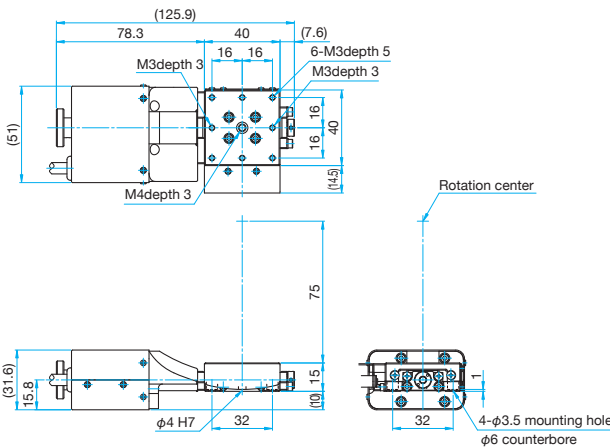
OSMS-40A60 Hexagon socket head cap screw M3x6...4 screws, Attachment pins



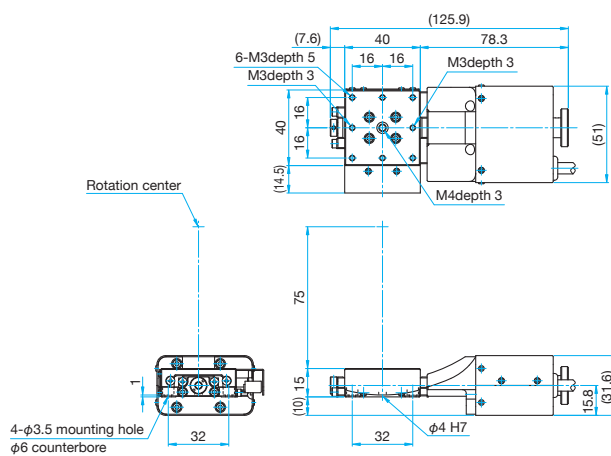
OSMS-40A60R Hexagon socket head cap screw M3x6...4 screws, Attachment pins



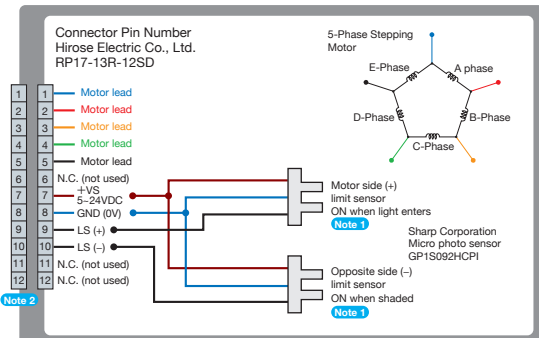
OSMS-40A75 Hexagon socket head cap screw M3x6...4 screws, Attachment pins



OSMS-40A75R Hexagon socket head cap screw M3x6...4 screws, Attachment pins



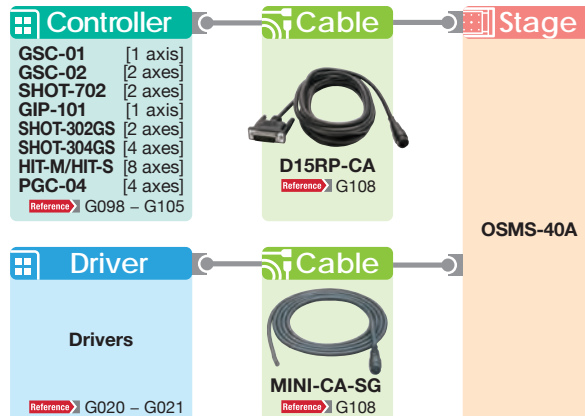
Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with origin and proximity origin sensors. Limit sensors are used as origin detection sensors.

Note 2 Compatible cable connector:
Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

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40mm

60mm

80mm

85mm

100mm

120mm

Others

Motorized Extended Guide Goniometer

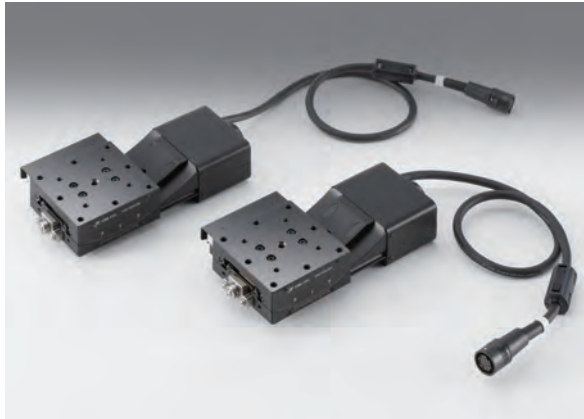
OSMS-60A Stage size □60mm

RoHS

CE

High precision motorized goniometers with integrated bearing ways for superior stiffness, accuracy and durability.

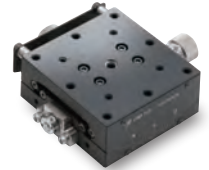
Their smooth movement is ideal for frequent angle adjustment.



- Cost-effective motorized stages achieved by integrated structure in which guides are directly processed on the main body to reduce the number of parts and assembly time.
- Attachment pins (accessories) are ideal for positioning when assembling into $\alpha\beta$ axis or mounting on various instruments or devices.

Guide

- ▶ Contact our International Sales Division if you desire to assemble into an $\alpha\beta$ axis stage.
- ▶ Manual type (GOHT-60) is also available.
Reference E172



GOHT-60

Specifications

Part Number		OSMS-60A60	OSMS-60A85	OSMS-60A105	
(Opposite Model)		OSMS-60A60R	OSMS-60A85R	OSMS-60A105R	
Mechanical Specifications	Travel [°]	±14	±9	±7	
	Table Size [mm]	60×60	60×60	60×60	
	Travel Mechanism (reduction ratio)	Worm gear (1: 246)	Worm gear (1: 314)	Worm gear (1: 380)	
	Positioning Slide	Extended Contact Ball Guide	Extended Contact Ball Guide	Extended Contact Ball Guide	
	Stage Material	SUS440C quench hardened	SUS440C quench hardened	SUS440C quench hardened	
	Finish	Super black chrome	Super black chrome	Super black chrome	
	Weight [kg]	0.85	0.75	0.75	
Size Tolerance	Stage Height [mm]	25	20	20	
	Rotation Center Height [mm]	60±0.1	85±0.1	105±0.1	
	Rotation Center Deflection Accuracy [mm]	Within ϕ 0.01	Within ϕ 0.01	Within ϕ 0.01	
Accuracy Specifications	Resolution	(Full) [°/pulse]	about 0.00293	about 0.00229	about 0.00198
		(Half) [°/pulse]	about 0.00146	about 0.00115	about 0.00095
	MAX Speed [°/sec]	10	8	6.6	
	Positional Repeatability [°]	±0.004	±0.004	±0.004	
	Load Capacity [N]	29.4(3.0kgf)	29.4 (3.0kgf)	29.4 (3.0kgf)	
	Moment Stiffness [°/N·cm]	Roll 0.3 Yaw 0.3	Roll 0.3 Yaw 0.3	Roll 0.3 Yaw 0.3	
Lost Motion [°]	0.02	0.02	0.02		
Sensor	Sensor Part Number	Micro photo sensor: GP1S097HCZ0F(Sharp Corporation): Limit Sensor, Origin Sensor			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	Equipped (NORMAL OPEN)	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	PK523HPB-C12 (□28mm)
	Step Angle	0.72°
Sensor	Power Voltage	DC - 5V - +24V
	Current Consumption	60mA or lower (20mA per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	When shaded: Output transistor OFF (no conduction): Limit sensor When shaded: Output transistor ON (conduction): Origin sensor

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-5MA, SG-55M, SG-55MA, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

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□40mm

□60mm

□80mm

□85mm

□100mm

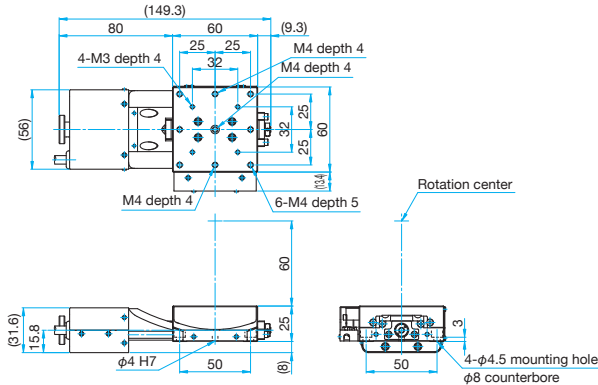
□120mm

Others

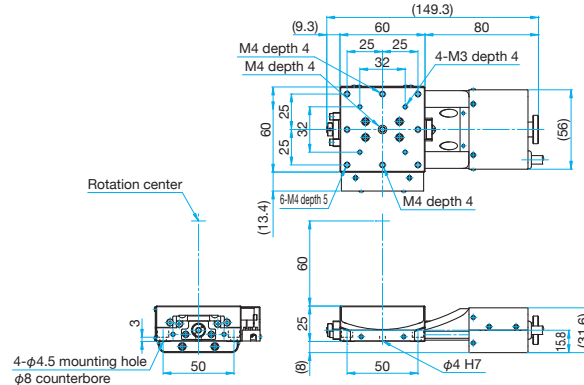


Outline Drawing

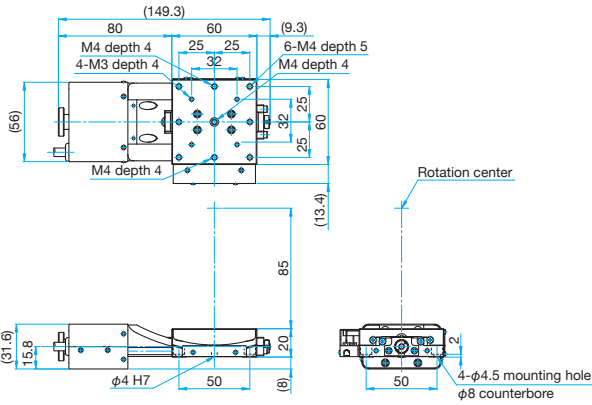
OSMS-60A60 Hexagon socket head cap screw M4x6...4 screws, Attachment pins



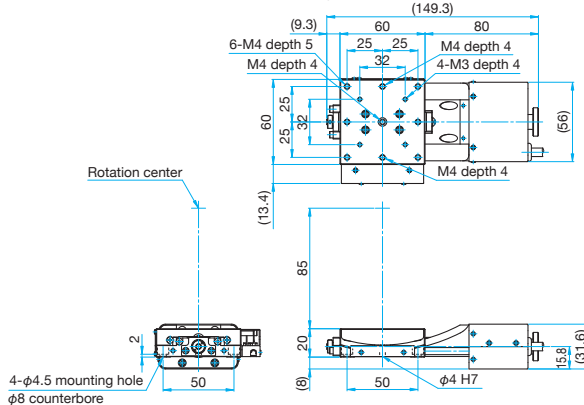
OSMS-60A60R Hexagon socket head cap screw M4x6...4 screws, Attachment pins



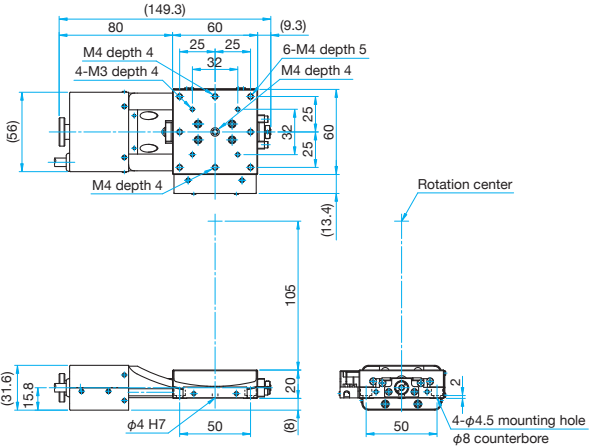
OSMS-60A85 Hexagon socket head cap screw M4x6...4 screws, Attachment pins



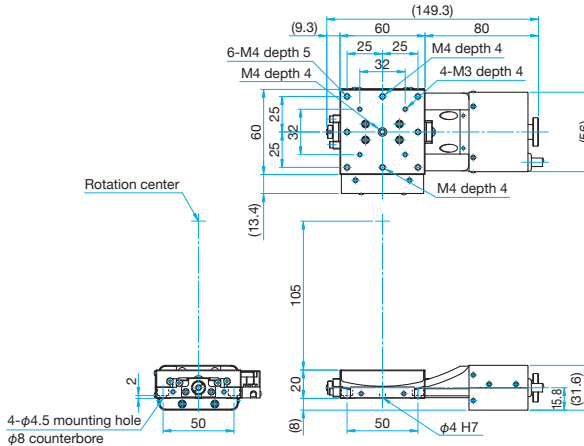
OSMS-60A85R Hexagon socket head cap screw M4x6...4 screws, Attachment pins



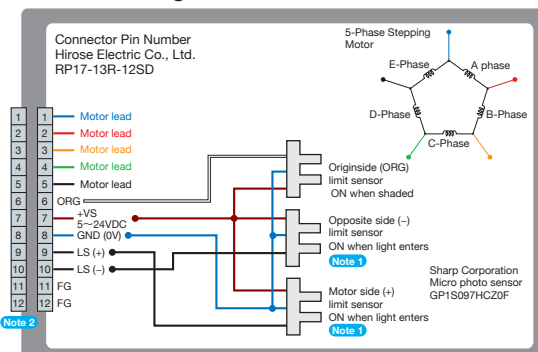
OSMS-60A105 Hexagon socket head cap screw M4x6...4 screws, Attachment pins



OSMS-60A105R Hexagon socket head cap screw M4x6...4 screws, Attachment pins



Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor. Motorized stages are not fitted with proximity origin sensors.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. RP17-13PA-12PC/RP17-PC-122

Compatible Controllers / Drivers and Cables

Controller	Cable	Stage
<ul style="list-style-type: none"> GSC-01 [1 axis] GSC-02 [2 axes] SHOT-702 [2 axes] GIP-101 [1 axis] SHOT-302GS [2 axes] SHOT-304GS [4 axes] HIT-M/HIT-S [8 axes] PGC-04 [4 axes] Reference: G098 - G105	<p>D15RP-CA Reference: G108</p>	<p>OSMS-60A</p>
Driver Drivers Reference: G020 - G021	<p>MINI-CA-SG Reference: G108</p>	

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40mm

60mm

80mm

85mm

100mm

120mm

Others

Motorized Goniometers - 5 Phase Stepping Motor

SGSP-A Stage size □60mm

RoHS

Stepping motor driven motorized goniometer stages fitted with crossed roller guide.



- High stiffness goniometer stages fitted with excellent abrasion-resistant crossed roller guide.
- Rotation center height from the table face is selectable according to the usage from 75mm, 100mm or 130mm.

Guide

- After purchasing two α axis stages, to assemble them into an $\alpha\beta$ axis stage, assembly adjustment cost and performance inspection cost will be charged separately.

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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		SGSP-60A75	SGSP-60A100	SGSP-60A130	
Mechanical Specifications	Angle Range [°]	±7	±5	±4	
	Table Size [mm]	60×60	60×60	60×60	
	Positioning Slide	Crossed roller guide	Crossed roller guide	Crossed roller guide	
	Travel Mechanism	Worm and worm wheel	Worm and worm wheel	Worm and worm wheel	
	Stage Material	Aluminum	Aluminum	Aluminum	
	Finish	Black anodized	Black anodized	Black anodized	
	Weight [kg]	0.65	0.55	0.65	
Size Tolerance	Stage Height [mm]	35	30	35	
	Rotation Center Height [mm]	75	100	130	
	Rotation Center Deflection Accuracy [mm]	φ0.05	φ0.05	φ0.05	
Accuracy Specifications	Resolution	(Full) [°/pulse]	about 0.002	about 0.001	about 0.001
		(Half) [°/pulse]	about 0.001	about 0.0005	about 0.0005
	MAX Speed [°/sec]	6	6	6	
	Positional Repeatability [°]	±0.004	±0.004	±0.004	
	Load Capacity [N]	24.5 (2.5kgf)	24.5 (2.5kgf)	24.5 (2.5kgf)	
	Moment Stiffness [°/N·cm]	1	1	1	
	Lost Motion [°]	0.02	0.02	0.02	
Sensor	Sensor Part Number	Micro photo sensor: GP1S092HCPI(Sharp Corporation)			
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)	
	Origin Sensor	None	None	None	
	Proximity Origin Sensor	None	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	C9863-90215P
	Step Angle	0.72°
Sensor	Power Voltage	DC5 - 24V
	Current Consumption	40mA or lower (20mA per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	When shaded: Output transistor OFF (no conduction)

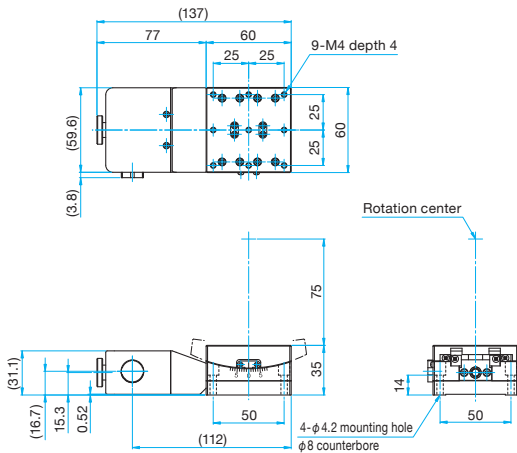
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S

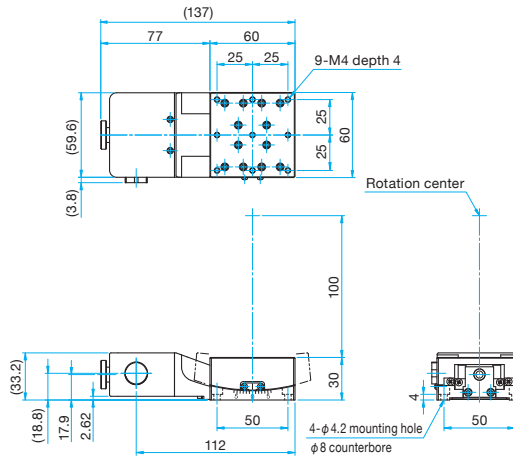


Outline Drawing

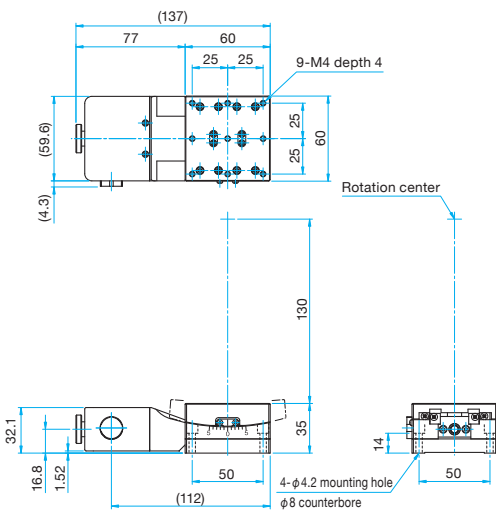
SGSP-60A75 Hexagonal socket head cap screw M4×18...4 screws



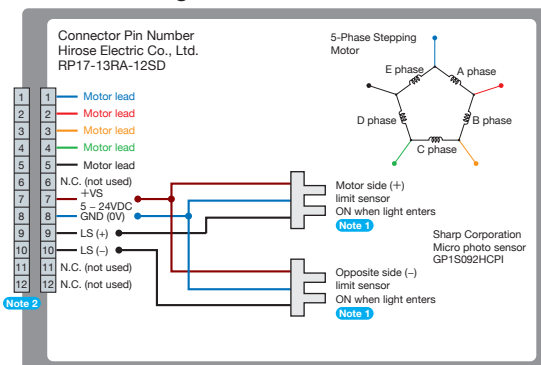
SGSP-60A100 Hexagonal socket head cap screw M4×18...4 screws



SGSP-60A130 Hexagonal socket head cap screw M4×18...4 screws

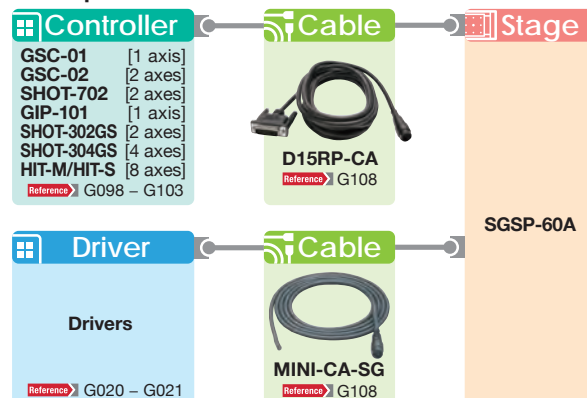


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. PR17-13PA-12PC/RP17-PC-122

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Motorized Goniometers - 5 Phase Stepping Motor

SGSP-B Stage size □60mm

RoHS

Stepping motor driven motorized goniometer stages fitted with crossed roller guide.



- Combination of two axes of excellent abrasion-resistant z stages enables flexible alignment.
- Rotation center height from the table face is selectable according to the usage from 75mm or 100mm.

Attention

- ▶ Assembly was adjusted for precision of both α and β axis stages. Note that if you disassemble the two axes, they might not work normally and may require assembly readjustment by us.

Specifications

Part Number		SGSP-60B75	SGSP-60B100
Mechanical Specifications	Angle Range [°]	(Upper)	β axis: ± 7
		(Lower)	α axis: ± 5
	Table Size [mm]	60×60	60×60
	Positioning Slide	Crossed roller	Crossed roller
	Travel Mechanism	Worm and worm wheel	Worm and worm wheel
	Stage Material	Aluminum	Aluminum
	Finish	Black anodized	Black anodized
Size Tolerance	Weight [kg]	1.10 (2 axes)	1.20 (2 axes)
	Stage Height [mm]	55	65
	Rotation Center Height [mm]	75	100
	Rotation Center Deflection Accuracy [mm]	—	—
Accuracy Specifications	Resolution	(Full) [°/pulse]	α axis: about 0.001, β axis: about 0.002
		(Half) [°/pulse]	α axis: about 0.0005, β axis: about 0.001
	MAX Speed [°/sec]	6	6
	Positional Repeatability [°]	Within ± 0.004	Within ± 0.004
	Load Capacity [N]	19.1 (1.9kgf)	19.1 (1.9kgf)
	Moment Stiffness [°/N·cm]	—	—
Sensor	Lost Motion [°]	—	—
	Sensor Part Number	GP1S092HCPI (Sharp Corporation)	
	Limit Sensor	Equipped (NORMAL CLOSE)	Equipped (NORMAL CLOSE)
	Origin Sensor	None	None
Proximity Origin Sensor	None	None	

Motor / Sensor Specifications

Motor	Type	5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	C9863-90215P
	Step Angle	0.72°
Sensor	Power Voltage	DC5 – 24V
	Current Consumption	40mA or lower (20mA per sensor)
	Control Output	NPN open collector output 50mA
	Output Logic	When shaded: Output transistor OFF (no conduction)

Configuration

Part Number	SGSP-60B75	SGSP-60B100
(Upper) β axis	SGSP-60A75	SGSP-60A100
(Lower) α axis	SGSP-60A100	SGSP-60A130

(Reference) Precision Specifications of Single Axis Stage

Part Number	SGSP-60A75	SGSP-60A100	SGSP-60A130	
Accuracy Specifications	Positional Repeatability [°]	± 0.004	± 0.004	± 0.004
	Moment Stiffness [°/N·cm]	1	1	1
	Lost Motion [°]	0.02	0.02	0.02

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC
	Compatible Controller	GSC-01, GSC-02, SHOT-702, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

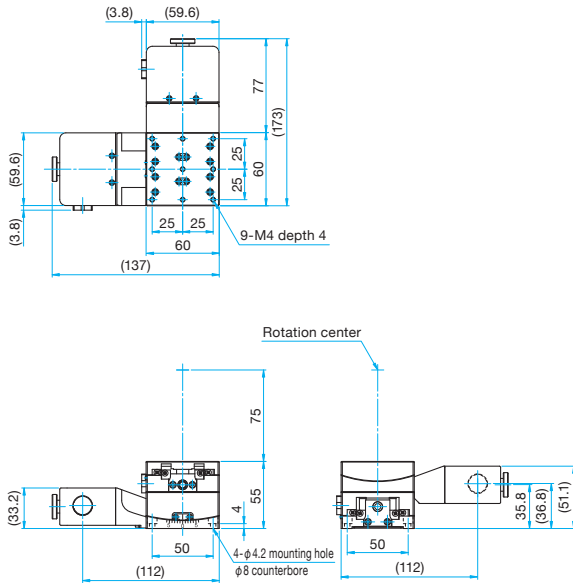
□120mm

Others

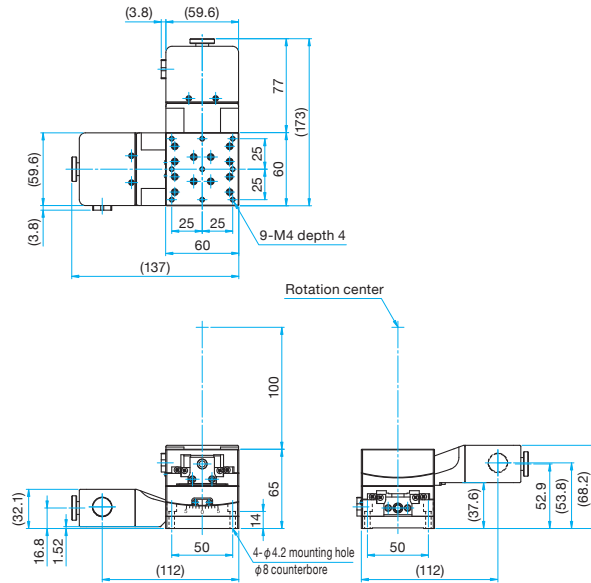


Outline Drawing

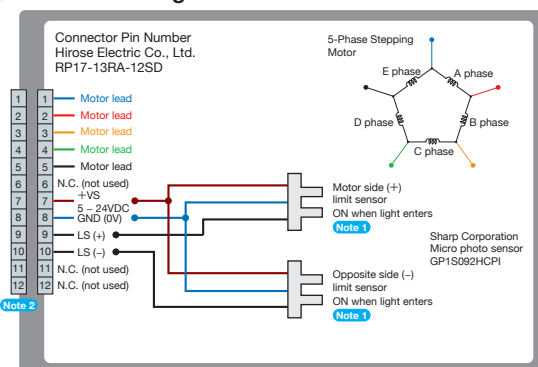
SGSP-60B75 Hexagonal socket head cap screw M4x8...4 screws



SGSP-60B100 Hexagonal socket head cap screw M4x18...4 screws

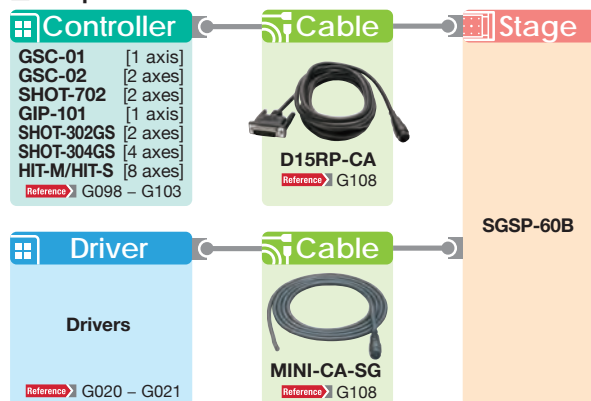


Connection Diagram



Note 1 The motor side limit sensor is the + direction limit sensor.
Note 2 Compatible cable connector: Hirose Electric Co., Ltd. PR17-13PA-12PC/RP17-PC-122

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40mm

60mm

80mm

85mm

100mm

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Vacuum Compatible Motorized Stage Guide | VSGSP Guide

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

For use in vacuum environments, the vacuum compatible stage series offers replacement with a stainless steel or machined aluminum body as well as replacement with vacuum grease, and uses a vacuum rated motor and a contact type or mechanical driven type switch, and Teflon coated cables for signal wires.

The series is suited for positioning in environments where the degree of vacuum is between 10^{-4} and 10^{-5} Pa. For the vacuum characteristics, see the measurement data of outgas volume, degree of vacuum, and mass component ratio.

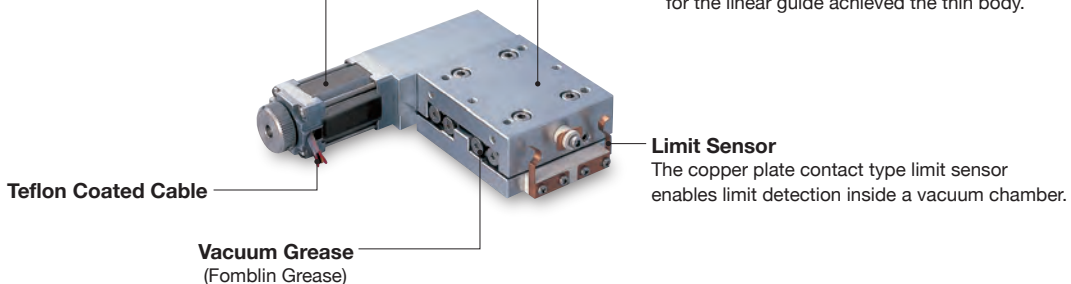
- In addition to the standard lineup, motor replacement, sensor replacement, special specifications such as vacuum compatible large mirror holders, and replacement of grease to vacuum grease for the guides or feed screws of standard specification stages to deal with low vacuum specifications are available. Contact our International Sales Division for more information.

Vacuum Compatible 5 Phase Stepping Motor

The $\square 24$ mm minimum size and lightest type motor saves space.

Compact Body

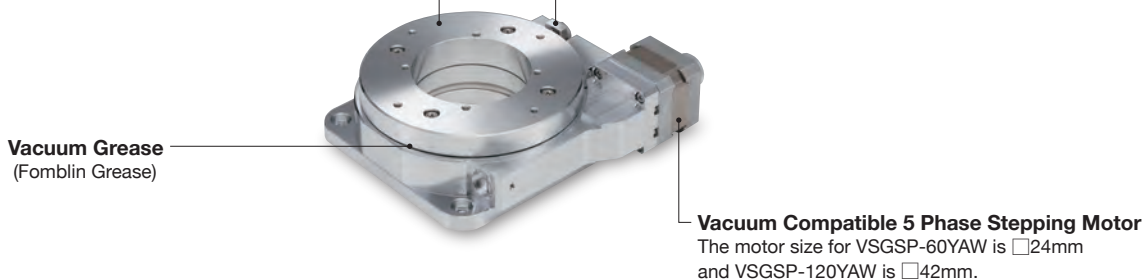
Machined Aluminum and use of a crossed roller for the linear guide achieved the thin body.



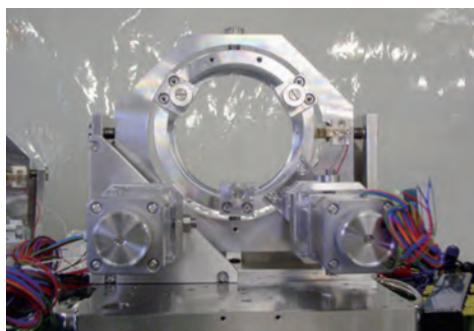
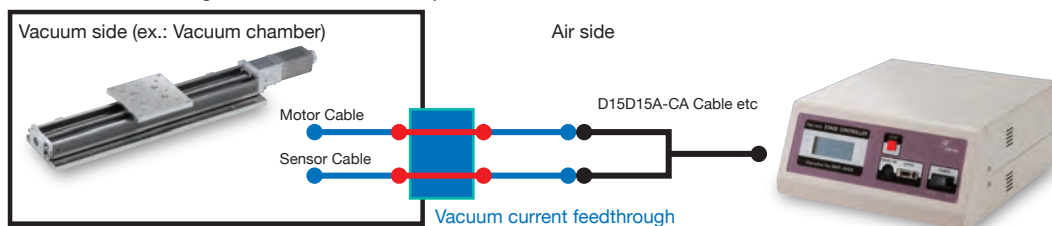
Rotation Table

The body is made of aluminum machining.

Limit Sensor
The high-vacuum compatible limit switch enables origin detection with high repeatability inside a vacuum chamber.
* Only for VSGSP-120YAW



[Attention] To use a vacuum compatible stage in a vacuum chamber, the connection cables between the vacuum side and the atmosphere side need to be relayed using a vacuum current feedthrough or the like. Prepare the feedthrough according to the vacuum chamber specifications.



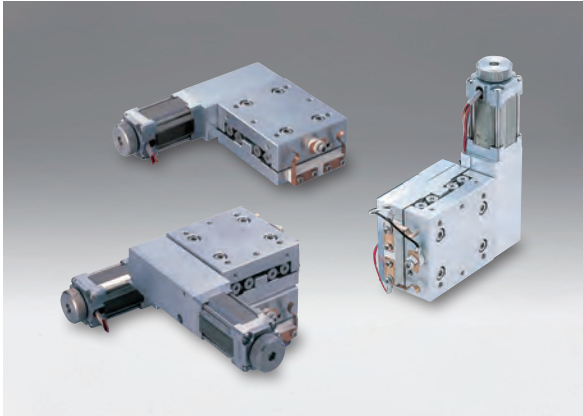
[Example of Special Order]
Vacuum Compatible Large Mirror Holder

Guide

- ▶ Because heat dissipation generally deteriorates in vacuum, specification temperature conditions are stricter than those for atmosphere. Check the usage conditions such as stage operation to make sure that the motor case temperature does not exceed 80°C.

Vacuum Applications Miniature Motorized Stages | VSGSP-60

Compact motorized stages used for experiments and inside a chamber of measuring instrument. Compact slim body is effective for space-saving.



Guide

- Fitted with 1m teflon coated cable to directly connect the vacuum motor or vacuum limit switch to the connector of chamber.

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Options

 40mm 60mm 80mm 85mm 100mm 120mm

Others

Specifications

Part Number		VSGSP-60(X)	VSGSP-60(XY)	VSGSP-60(Z)
Mechanical Specifications	Travel [mm]	20	20	20
	Table Size [mm]	55×60	55×60	55×60
	Feed Screw	Precision ground screw ϕ 4mm, 0.5mm lead	Precision ground screw ϕ 4mm, 0.5mm lead	Precision ground screw ϕ 4mm, 0.5mm lead
	Positioning Slide	Crossed roller guide	Crossed roller guide	Crossed roller guide
	Stage Material	Aluminum	Aluminum	Aluminum
	Finish	None	None	None
	Weight [kg]	0.55	1.1	0.6
Accuracy Specifications	Resolution	(Full) [μ m]	1	1
		(Half) [μ m]	0.5	0.5
	MAX Speed [mm/sec]	5	5	—
	Positional Repeatability [μ m]	6	6	6
	Load Capacity [N]	29.4 (3.0kgf)	19.6 (2.0kgf)	14.7 (1.5kgf)
Lost Motion [μ m]	5	5	5	
Sensor	Type	Vacuum limit switch	Vacuum limit switch	Vacuum limit switch
	Limit Sensor	Contact type	Contact type	Contact type
	Origin Sensor	None	None	None
	Proximity Origin Sensor	None	None	None

Motor / Sensor Specifications

Motor	Type	Vacuum compatible 5-phase stepping motor 0.66A/phase (Tamagawa Seiki Co., Ltd.)		
	Motor Part Number	TS3664N5 (□24mm)		
	Step Angle	0.72°		
Sensor	Control Output	Contact type	Contact type	Contact type
	Output Logic	NORMAL OPEN	NORMAL OPEN	NORMAL OPEN

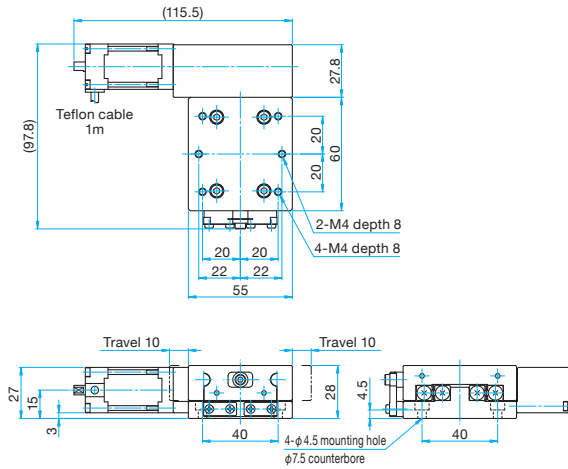
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

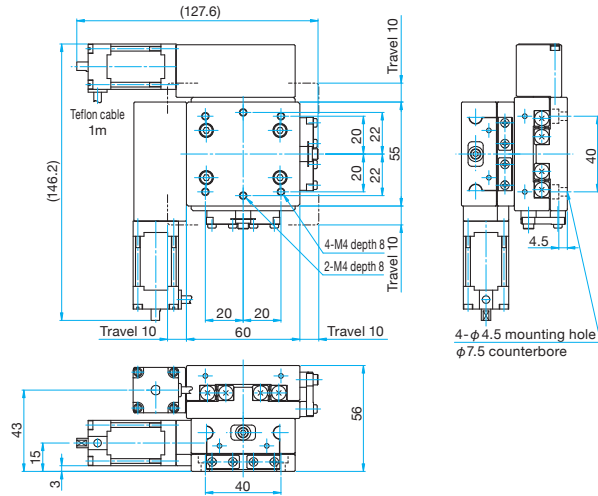


Outline Drawing

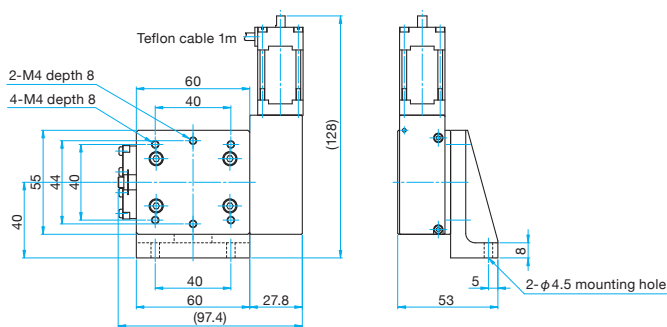
VSGSP-60(X) Hexagonal socket head cap screw M4×10...4 screws



VSGSP-60(XY) Hexagonal socket head cap screw M4×10...4 screws



VSGSP-60(Z) Hexagonal socket head cap screw M4×15...2 screws

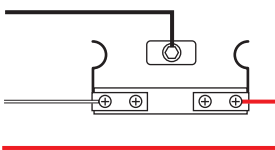


Vacuum Limit Switch

GND (0V) black lead

Motor side (+) limit switch
LS (+) white lead

Opposite side (-) limit switch
LS (-) red lead



* Use the motor side and opposite side limit switches as normal open.

Wiring of Vacuum Stages

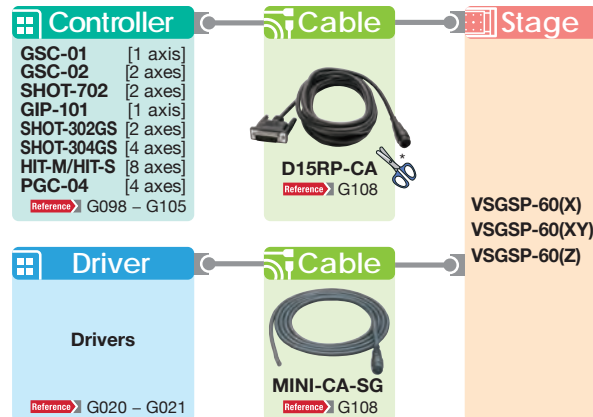
The vacuum compatible stepping motor TS3664N5 used for vacuum stages has five bare lead wires.

For wiring, they correspond to the motor lead colors shown in the wiring diagrams of driver or cable as follows.

(The motor leads shown in the connection diagrams of driver or cable indicate wiring of stepping motors used for normal stages.)

	Vacuum stage motor lead color	Motor lead color shown in driver or cable connection diagram
Corresponding connection	1 Blue	Blue
	2 Red	Red
	3 Red White	Orange
	4 Yellow	Green
	5 Black	Black
	Vacuum compatible stage motor connection diagram	5-phase stepping motor connection diagram

Compatible Controllers / Drivers and Cables



* Make the cable into bare wire specification after purchase.

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Options

□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Vacuum Compatible Motorized Stages | VSGSP-(X)

Motorized stages fitted with a limit sensor compatible with vacuum environments.

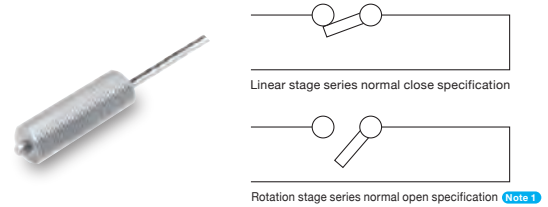
- Linear system has a long travel between 35 – 200mm, and is as compact as the conventional SGSP series.



Guide

- ▶ Motor cables and sensor cables are 1m bare wires.

■ Limit Sensor (high vacuum compatible switch)



Note 1 Set the controller of vacuum compatible motorized rotation stages to normal open.

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Specifications

Part Number		VSGSP20-35(X)	VSGSP20-85(X)	VSGSP26-200(X)
Mechanical Specifications	Travel [mm]	35	85	200
	Table Size [mm]	60×60	60×60	80×80
	Feed Screw	Ball screw diameter ϕ 6mm, 1mm lead	Ball screw diameter ϕ 6mm, 1mm lead	Ball screw diameter ϕ 8mm, 2mm lead
	Positioning Slide	Outer rail structure	Outer rail structure	Outer rail structure
	Stage Material	Aluminum / Stainless steel	Aluminum / Stainless steel	Aluminum / Stainless steel
	Finish	None	None	None
	Weight [kg]	1.0	1.1	2.5
Accuracy Specifications	Resolution	(Full) [μ m]	2	4
		(Half) [μ m]	1	2
	MAX Speed [mm/sec]	10	10	20
	Positional Repeatability [μ m]	5	5	10
	Load Capacity [N]	39.2(4.0kgf)	39.2(4.0kgf)	58.8(6.0kgf)
Lost Motion [μ m]	3	3	10	
Sensor	Sensor Part Number	GN-PT5M3B-1 (Metrol Co., Ltd.)	GN-PT5M3B-1 (Metrol Co., Ltd.)	GN-PT5M3B-1 (Metrol Co., Ltd.)
	Limit Sensor	Vacuum touch sensor (NORMAL CLOSE)	Vacuum touch sensor (NORMAL CLOSE)	Vacuum touch sensor (NORMAL CLOSE)
	Origin Sensor	None	None	None
	Proximity Origin Sensor	None	None	None

Motor / Sensor Specifications

Motor	Type	Vacuum compatible 5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)		
	Motor Part Number	A7298-90215KV (□28mm)	A7298-90215KV (□28mm)	A7298-90215KV (□28mm)
	Step Angle	0.72°		
Sensor	Power Voltage	DC5-24V		
	Current Consumption	10mA(Max 20mA)		
	Control Output	Mechanical		
	Output Logic	NORMAL CLOSE	NORMAL CLOSE	NORMAL CLOSE

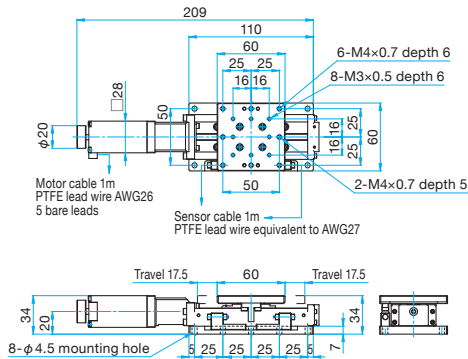
Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

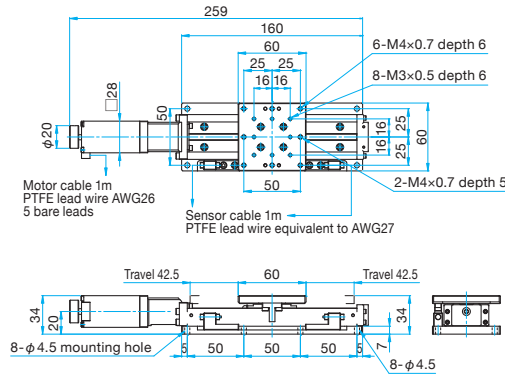


Outline Drawing

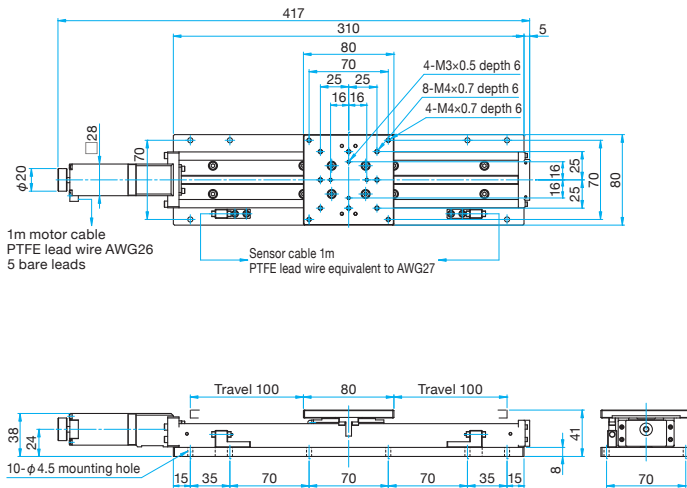
VSGSP20-35(X) Hexagonal socket head cap screw M4×12...4 screws



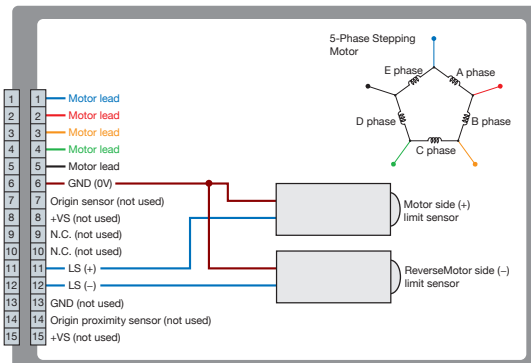
VSGSP20-85(X) Hexagonal socket head cap screw M4×12...4 screws



VSGSP26-200(X) Hexagonal socket head cap screw M4×12...8 screws

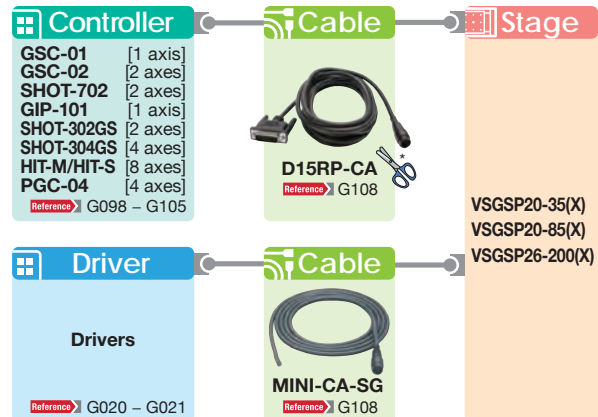


Connection Diagram



* Motor cables and sensor cables are bare wires.

Compatible Controllers / Drivers and Cables



* Make the cable into bare wire specification after purchase.

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Options

□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

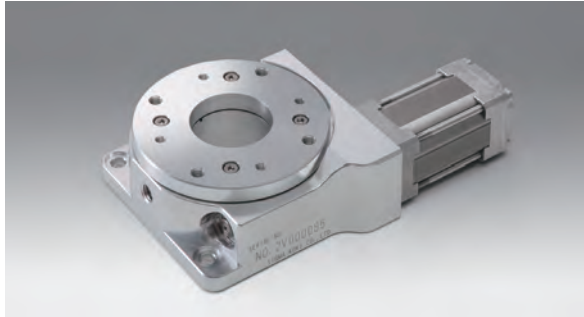
Others

Vacuum Compatible Rotation Motorized Stage | VSGSP-YAW

Rotation motorized stages for vacuum environment.

The $\phi 60\text{mm}$ compact type is space saving, and best suited for experiments and use in chambers of inspection equipment.

The $\phi 120\text{mm}$ type is equipped with a limit sensor compatible with vacuum environments. It is thin but has high load capacity because of its $\square 42\text{mm}$ large motor.



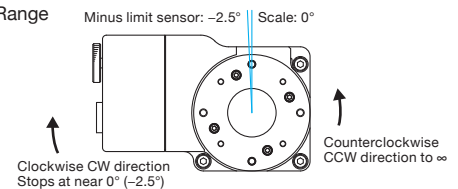
Guide

- ▶ Motor cables and sensor cables are 1m bare wires.



Guide

- ▶ Rotation Range



- ▶ Homing of rotation motorized stages is performed using the CW limit sensor as the origin sensor.
- ▶ Origin detection is adjusted so that the stage stops at 0 degrees when homing is performed in the MINI system at half step.

Specifications

Part Number		VSGSP-60YAW	VSGSP-120YAW	
Mechanical Specifications	Rotation Range	In the CW or CCW direction to ∞	Counterclockwise CCW direction to ∞ , Clockwise CW direction stops at near 0 degree (-2.5°)	
	Table Size [mm]	$\phi 60$	$\phi 120$	
	Feed Screw	Worm and worm wheel	Worm and worm wheel	
	Positioning Slide	Bearing	Crossed roller	
	Stage Material	Aluminum	Aluminum / Stainless steel	
	Finish	None	None	
	Weight [kg]	0.45	1.7	
Accuracy Specifications	Resolution [°]	(Full) [°]	0.005	0.005
		(Half) [°]	0.0025	0.0025
	MAX Speed [°/sec]	20	20	
	Positional Repeatability [°]	0.02	0.02	
	Load Capacity [N]	29.4 (3.0kgf)	98.0 (10.0kgf)	
Lost Motion [°]	0.05	0.05		
Sensor	Type	None	GN-STM35A-1 (Metrol Co., Ltd.)	
	Limit Sensor	None	Vacuum touch sensor (NORMAL OPEN)	
	Origin Sensor	None	None	
	Proximity Origin Sensor	None	None	

Motor / Sensor Specifications

Motor	Type	Vacuum compatible 5-phase stepping motor 0.66A/phase (Tamagawa Seiki Co., Ltd.)	Vacuum compatible 5-phase stepping motor 0.75A/phase (Oriental Motor Co., Ltd.)
	Motor Part Number	TS3664N5 ($\square 24\text{mm}$)	PK543V-NB ($\square 42\text{mm}$)
	Step Angle	0.72°	0.72°
Sensor	Control Output	—	DC5-24V
	Output Logic	—	Current Consumption 10mA(Max 20mA)
	Control Output	Contact type	Mechanical
	Output Logic	NORMAL OPEN	NORMAL OPEN

Compatible Driver / Controller

Control System	Compatible Driver	SG-5M, SG-55M, SG-514MSC, MC-7514PCL
	Compatible Controller	GSC-01, GSC-02, SHOT-702, GIP-101, SHOT-302GS, SHOT-304GS, HIT-M·HIT-S, PGC-04

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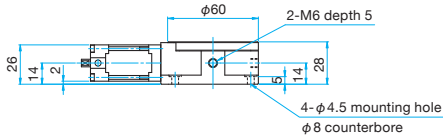
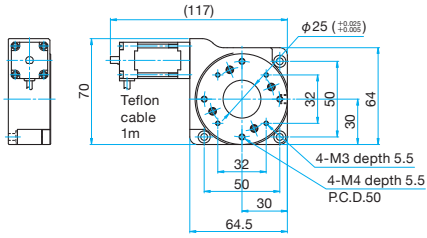
 40mm 60mm 80mm 85mm 100mm 120mm

Others

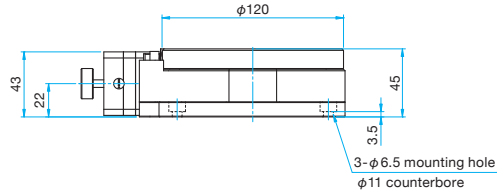
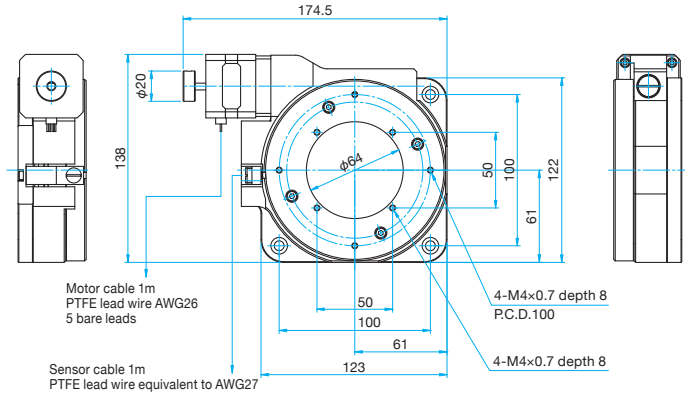


Outline Drawing

VSGSP-60YAW Hexagonal socket head cap screw M4x10...3 screws



VSGSP-120YAW Hexagon socket head cap screw M6x10...3 screws

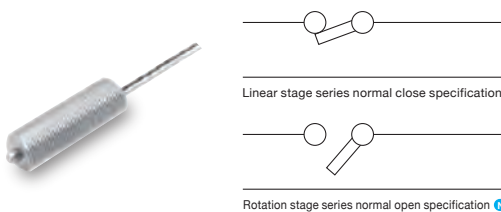


Wiring of Vacuum Stages

The vacuum compatible stepping motor TS3664N5 used for vacuum stages has five bare lead wires. For wiring, they correspond to the motor lead colors shown in the wiring diagrams of driver or cable as follows. (The motor leads shown in the connection diagrams of driver or cable indicate wiring of stepping motors used for normal stages.)

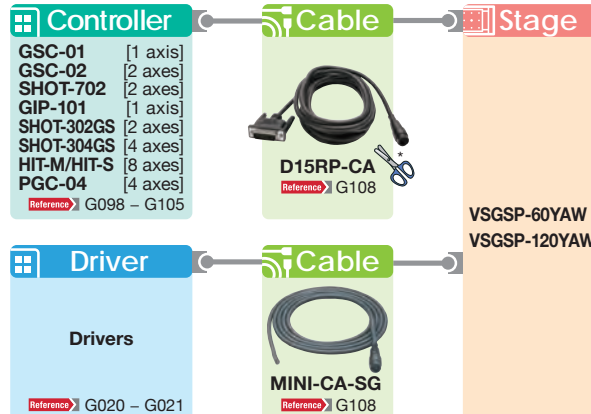
	Vacuum stage motor lead color	Motor lead color shown in driver or cable connection diagram
Conventional Controller	1 Blue	Blue
	2 Red	Red
	3 Red White	Orange
	4 Yellow	Green
	5 Black	Black
	Vacuum compatible stage motor connection diagram	5-phase stepping motor connection diagram (SGSP series)

Limit Sensor (high vacuum compatible switch)



Note 1 Set the controller of vacuum compatible motorized rotation stages to normal open.

Compatible Controllers / Drivers and Cables



* Make the cable into bare wire specification after purchase.

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□ 40mm

□ 60mm

□ 80mm

□ 85mm

□ 100mm

□ 120mm

Others

Single axis Stage Controller | GSC-01



Catalog Code **W9042**

A single axis stage controller with built-in 5-phase stepping motor driver.

- External control with RS232C interface, operation with a jog switch on the front panel, and jog operation with external I/O are available.



Guide

- ▶ Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2012)

Attention

- ▶ Power supply is DC+24V 2A. You need to purchase the PAT-001-POW1 (AC adapter) or prepare an adapter separately

Part Name	Part Number
Single axis Stage Controller	GSC-01
AC Adapter	PAT-001-POW1

Primary Functions

Controller Function	○
Number of Control Axes	1
Stored Program Control	—
Feedback Control	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Driver Function	Standard
Micro-step (Max. Division)	2
Driving Current (A/phase)	0.2 – 0.8

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	16,777,215
Max. Driving Speed (pps)	20,000
Min. Driving Speed (pps)	100
Acceleration/Deceleration Time (ms)	0 – 1,000

Control Command

Machine Origin Return	○
Theoretical Origin Setting	○
Relative Position Drive	○
Absolute Position Drive	○
Jog Operation	○
Position Appointment	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Drive	○
Deceleration Stop	○
Emergency Stop	○
Speed Setting	○
Motor Free/Hold	○
Port Input	○
Port Output	○
Origin Offset Setting	○
Jog Operation Speed Setting	○

I/O Specification

Origin Sensor	—
Proximity Sensor	—
CW (+) Limit	○
CCW (-) Limit	○
General Purpose Input	4 points
General Purpose Output	4 points
Control Input	3 points
Control Output	—
Trigger Output	—

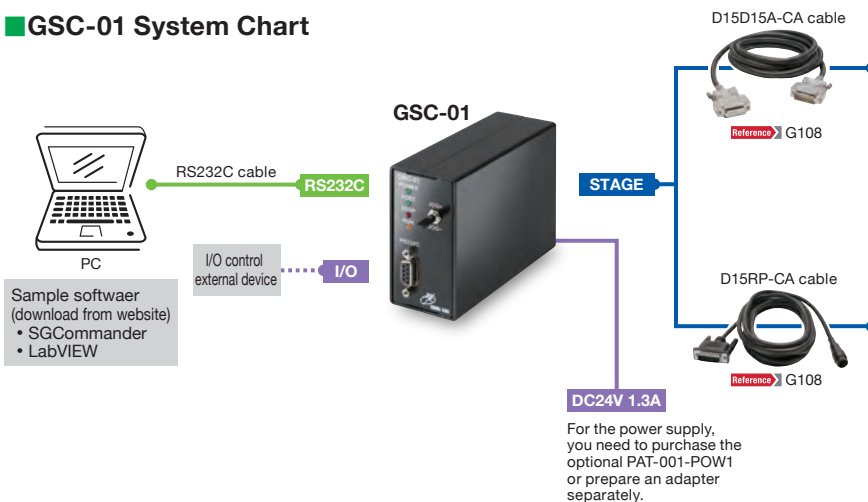
General Specifications

Power Voltage	DC24V 2A
Power Consumption	48VA
Operating Temperature	5 – 40°C
Storage Temperature	—
Ambient Humidity	20 – 80%RH
External Dimensions (WxHxDmm)	47x125x90
Weight (kg)	0.4

Interface

GP-IB	—
RS232C	○
USB	—
Ethernet	—

GSC-01 System Chart



Stepping Motor Stage



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□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

A 2 axis stage controller with built-in 5-phase stepping motor driver.

- External control with RS232C interface, manual operation and programmed operation with a dedicated controller (SJT-02).



Guide

- Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)

Attention

- Power supply is DC+24V 2A. You need to purchase the PAT-001-POW1 (AC adapter) or prepare an adapter separately

Part Name	Part Number
2 axis Stage Controller	GSC-02
Joystick Terminal	SJT-02
AC Adapter	PAT-001-POW1

Primary Functions

Controller Function	<input type="radio"/>
Number of Control Axes	2
Stored Program Control	<input type="checkbox"/>
Feedback Control	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Driver Function	Standard
Micro-step (Max. Division)	2 (half step only)
Driving Current (A/phase)	0.3 – 0.8

△...Programs can be controlled using SJT-02.

General Specifications

Power Voltage	DC24V 2A
Power Consumption	48VA
Operating Temperature	5 – 40°C
Storage Temperature	-20 – 60°C
Ambient Humidity	20 – 80%RH
External Dimensions (W×H×Dmm)	180×40×125
Weight (kg)	0.7

Interface

GP-IB	—
RS232C	<input type="radio"/>
USB	—
Ethernet	—

Optional

CJ-200A	—
JS-300	—
JB-400	—
SJT-02	<input type="radio"/>

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	16,777,214
Max. Driving Speed (pps)	20,000
Min. Driving Speed (pps)	1
Acceleration/Deceleration Time (ms)	0 – 1,000

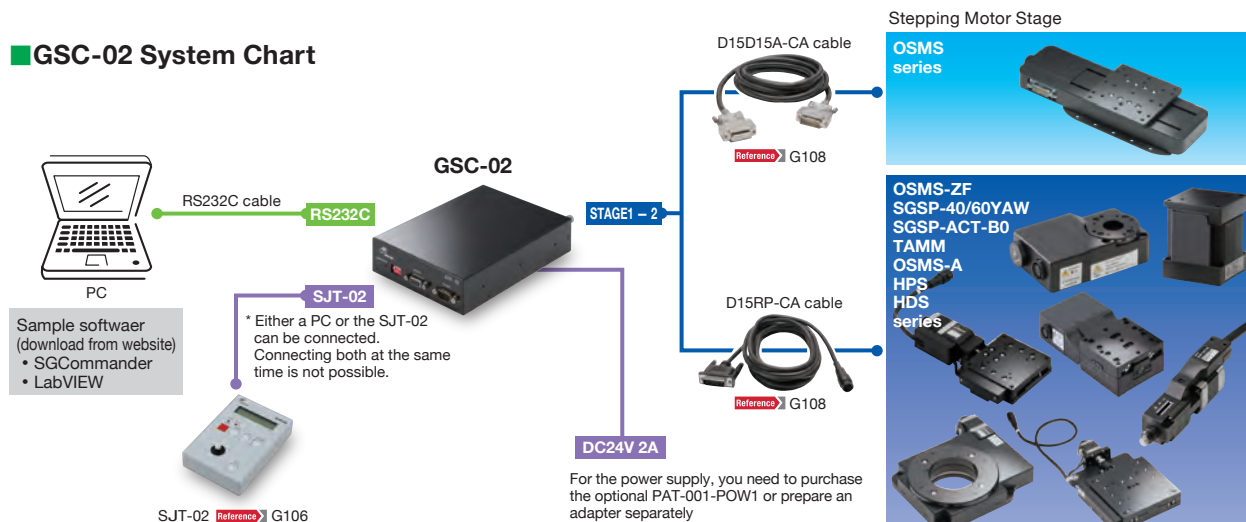
I/O Specification

Origin Sensor	<input type="radio"/>
Proximity Sensor	<input type="radio"/>
CW (+) Limit	<input type="radio"/>
CCW (-) Limit	<input type="radio"/>
General Purpose Input	—
General Purpose Output	—
Control Input	—
Control Output	—
Trigger Output	—

Control Command

Machine Origin Return	<input type="radio"/>
Theoretical Origin Setting	<input type="radio"/>
Relative Position Drive	<input type="radio"/>
Absolute Position Drive	—
Jog Operation	<input type="radio"/>
Position Appointment	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Drive	<input type="radio"/>
Deceleration Stop	<input type="radio"/>
Emergency Stop	<input type="radio"/>
Speed Setting	<input type="radio"/>
Motor Free/Hold	<input type="radio"/>
Port Input	—
Port Output	—

GSC-02 System Chart



2 axis Stage Controller | SHOT-702



Catalog Code W9045

A 2 axis stage controller with built-in micro-step driver.

- External control with RS232C interface and manual operation with dedicated controllers (JS-300, JB-400).



Guide

- ▶ Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)

Part Name	Part Number
2 axis Stage Controller	SHOT-702
Joy Stick	JS-300
Jog Operation Box	JB-400
Jog Dial	JD-100
MDR Cable	MDR14-CA-2.5

Primary Functions

Controller Function	<input type="radio"/>
Number of Control Axes	2
Stored Program Control	—
Feedback Control	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Driver Function	Micro-step
Micro-step (Max. Division)	250
Driving Current (A/phase)	0.1 – 1.1

General Specifications

Power Voltage	AC100 – 240V 50/60Hz
Power Consumption	50VA
Operating Temperature	5 – 40°C
Storage Temperature	–20 – 60°C
Ambient Humidity	20 – 80%RH
External Dimensions (W×H×Dmm)	260×70×280
Weight (kg)	2.8

Interface

GP-IB	—
RS232C	<input type="radio"/>
USB	—
Ethernet	—

Optional

CJ-200A	—
JS-300	<input type="radio"/>
JB-400	<input type="radio"/>
JD-100	<input type="radio"/>
SJT-02	—

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	268,435,455
Max. Driving Speed (pps)	500,000
Min. Driving Speed (pps)	1
Acceleration/Deceleration Time (ms)	1 – 1,000

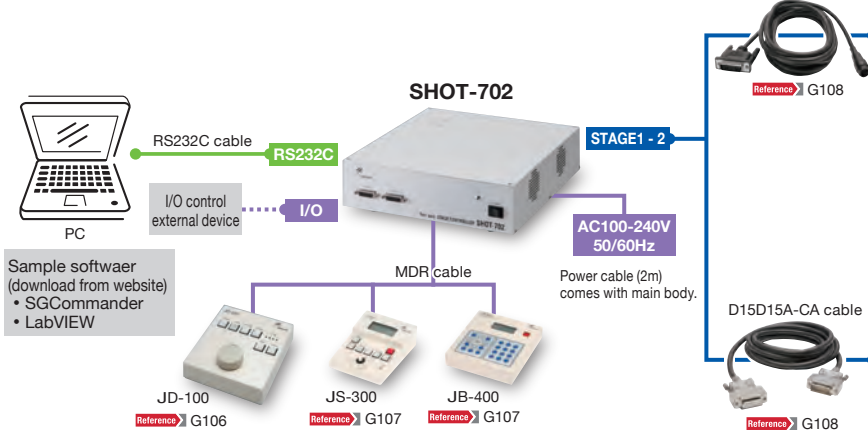
I/O Specification

Origin Sensor	<input type="radio"/>
Proximity Sensor	<input type="radio"/>
CW (+) Limit	<input type="radio"/>
CCW (–) Limit	<input type="radio"/>
General Purpose Input	1 point
General Purpose Output	1 point
Control Input	1 point
Control Output	1 point
Trigger Output	—

Control Command

Machine Origin Return	<input type="radio"/>
Theoretical Origin Setting	<input type="radio"/>
Relative Position Drive	<input type="radio"/>
Absolute Position Drive	<input type="radio"/>
Jog Operation	<input type="radio"/>
Position Appointment	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Drive	<input type="radio"/>
Deceleration Stop	<input type="radio"/>
Emergency Stop	<input type="radio"/>
Speed Setting	<input type="radio"/>
Motor Free/Hold	<input type="radio"/>
Port Input	<input type="radio"/>
Port Output	<input type="radio"/>

SHOT-702 System Chart



Stepping Motor Stage



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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

A single axis controller with built-in micro-step driver having a 5-point preset function.

- Compatible with objective lens turrets and other LASER accessory units in addition to motorized stages fitted with 5-phase stepping motor.



Guide

- ▶ Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)

Part Name	Part Number
Intelligent Positioning System	GIP-101

Primary Functions

Controller Function	○
Number of Control Axes	1
Stored Program Control	—
Feedback Control	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Driver Function	Micro-step
Micro-step (Max. Division)	250
Driving Current (A/phase)	0.23 – 0.75

General Specifications

Power Voltage	AC100 – 240V 50/60Hz
Power Consumption	100VA
Operating Temperature	0 – 40°C
Storage Temperature	—
Ambient Humidity	20 – 80%RH
External Dimensions (W×H×Dmm)	145×205×81
Weight (kg)	2

Interface

GP-IB	—
RS232C	○
USB	—
Ethernet	—

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	16,777,214
Max. Driving Speed (pps)	22,000
Min. Driving Speed (pps)	50
Acceleration/Deceleration Time (ms)	20 – 1,000 16 steps

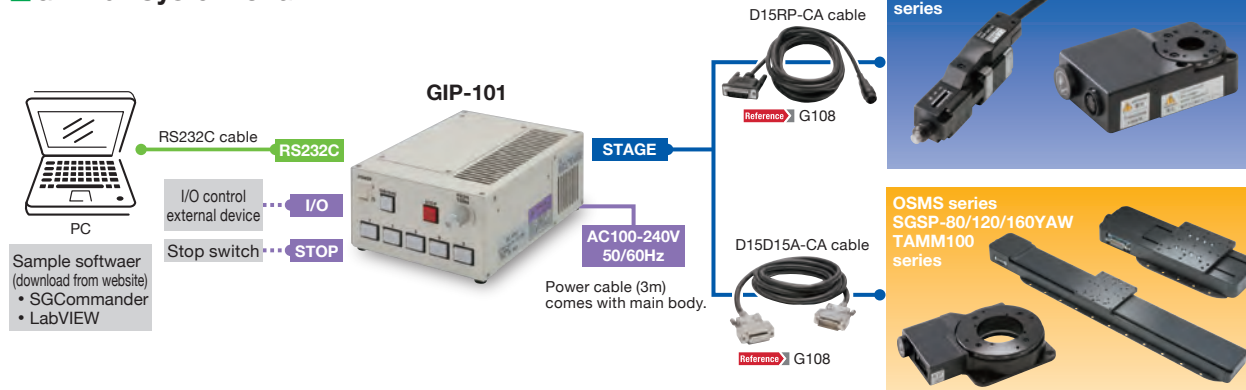
I/O Specification

Origin Sensor	○
Proximity Sensor	○
CW (+) Limit	○
CCW (-) Limit	○
General Purpose Input	—
General Purpose Output	—
Control Input	6 points
Control Output	1 point
Trigger Output	—

Control Command

Machine Origin Return	○
Theoretical Origin Setting	○
Relative Position Drive	○
Absolute Position Drive	○
Jog Operation	○
Position Appointment	○
Circular Interpolation Control	—
Linear Interpolation Control	—
Drive	○
Deceleration Stop	○
Emergency Stop	○
Speed Setting	○
Motor Free/Hold	○
Port Input	○
Port Output	○

GIP-101 System Chart



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- 85mm
- 100mm
- 120mm
- Others

2 axis / 4 axis Stage Controllers

SHOT-GS



Catalog Code W9047

2 axis and 4 axis stage controllers with built-in micro-step driver.

- External control with RS232C/GP-IB/USB interfaces, manual operation with a control pad (CJ-200A) or dedicated controllers (JS-300, JB-400, JD-100), and automatic control with two banks of stored programs are available.
- Full closed loop control is possible when used in combination with a stage with built in glass-scale.



Guide

- ▶ Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)
 - LabVIEW for GP-IB (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)

Part Name	Part Number
2 axis Stage Controller	SHOT-302GS
4 axis Stage Controller	SHOT-304GS
Control Pad	CJ-200A
Joy Stick	JS-300
Jog Operation Box	JB-400
Jog Dial	JD-100
MDR Cable	MDR14-CA-2.5

Primary Functions

Part Number	SHOT-302GS	SHOT-304GS
Controller Function	○	
Number of Control Axes	2	4
Stored Program Control	○	
Feedback Control	GS	
Circular Interpolation Control	○	
Linear Interpolation Control	2 axes	
Driver Function	Micro-step	
Micro-step (Max. Division)	250	
Driving Current (A/phase)	0.25 - 1.4	
CJ-200A	Required	

Optional

CJ-200A	○
JS-300	○
JB-400	○
JD-100	○
SJT-02	—

Performance Specifications

Coordinate Indication Range	±999,999,999
Max. Travel to Set	268,435,455
Max. Driving Speed (pps)	500,000
Min. Driving Speed (pps)	1
Acceleration/Deceleration Time (ms)	0 - 1,000

Control Command

Machine Origin Return	○
Theoretical Origin Setting	○
Relative Position Drive	○
Absolute Position Drive	○
Jog Operation	○
Position Appointment	—
Circular Interpolation Control	○
Linear Interpolation Control	○
Drive	○
Deceleration Stop	○
Emergency Stop	○
Speed Setting	○
Motor Free/Hold	○
Port Input	○
Port Output	○

General Specifications

Power Voltage	AC100 - 240V	50/60Hz
Power Consumption	160VA	300VA
Operating Temperature	5 - 40°C	
Storage Temperature	-20 - 60°C	
Ambient Humidity	20 - 80%RH	
External Dimensions (W×H×Dmm)	270×302×118	
Weight (kg)	5.5	6.5

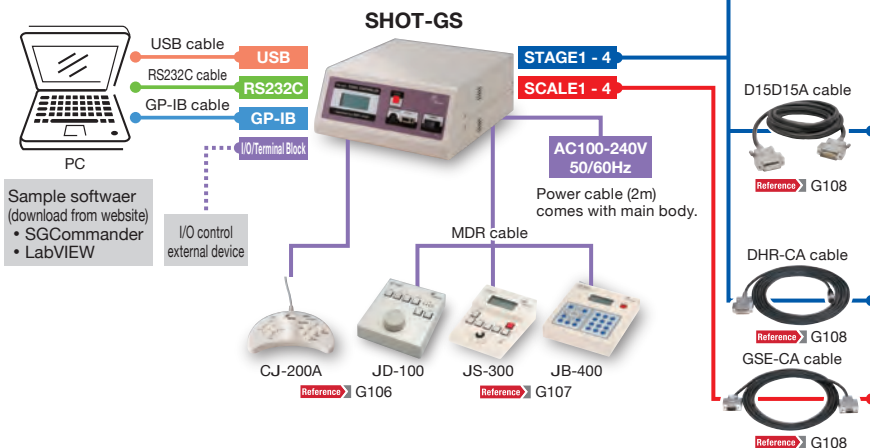
I/O Specification

Origin Sensor	○
Proximity Sensor	○
CW (+) Limit	○
CCW (-) Limit	○
General Purpose Input	4 points
General Purpose Output	4 points
Control Input	15 points
Control Output	5 points
Trigger Output	○

Interface

GP-IB	○
RS232C	○
USB	○
Ethernet	—

SHOT-302GS/304GS System Chart



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□60mm

□80mm

□85mm

□100mm

□120mm

Others

Stage control system with Master controller and from one to eight slave Axes.

- Control with RS232C/USB/Ethernet interfaces is available.
- Full closed loop control is possible when used in combination with a stage with built in glass-scale.



Guide

- ▶ Sample programs are available for download from our website.
 - HIT sample
 - SGCommander 32-bit version for Windows® (only for RS232C)
 - SGCommander 32/64-bit version for Windows® (only for RS232C)
 - LabVIEW for RS232C (for v.5.1/v.6i/v7.1/v.8.6/v.2010/v.2012)

Attention

- ▶ Power supply is DC+24V 1A. Depending on the number of stage axes, rated current of 2A (single axis) to 9A (8 axes) is required. You need to purchase the PAT-001-POW1 (AC adapter) or prepare an adapter separately.

Part Name	Part Number
Extensible Stage Controller (Master)	HIT-M
Extensible Stage Controller (Slave)	HIT-S
LAN Cable	LAN-2
AC Adapter	PAT-001-POW1

Primary Functions

Part Number	HIT-M	HIT-S
Controller Function	○	—
Number of Control Axes	8	—
Stored Program Control	○	—
Feedback Control	GS	—
Circular Interpolation Control	○	—
Linear Interpolation Control	3 axes	—
Driver Function	—	Micro-step
Micro-step (Max. Division)	—	250
Driving Current (A/phase)	—	0.1 – 1.1

General Specifications

Power Voltage	DC24V 1A
Power Consumption	24VA
Operating Temperature	5 – 40°C
Storage Temperature	–20 – 60°C
Ambient Humidity	20 – 80%RH
External Dimensions (WxHxDmm)	130x120x50
Weight (kg)	0.62 0.63

Interface

GP-IB	—
RS232C	○
USB	○
Ethernet	○

Optional

CJ-200A	—
JS-300	—
JB-400	—
JD-100	—
SJT-02	—

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	134,217,727
Max. Driving Speed (pps)	500,000
Min. Driving Speed (pps)	1
Acceleration/Deceleration Time (ms)	1 – 1,000

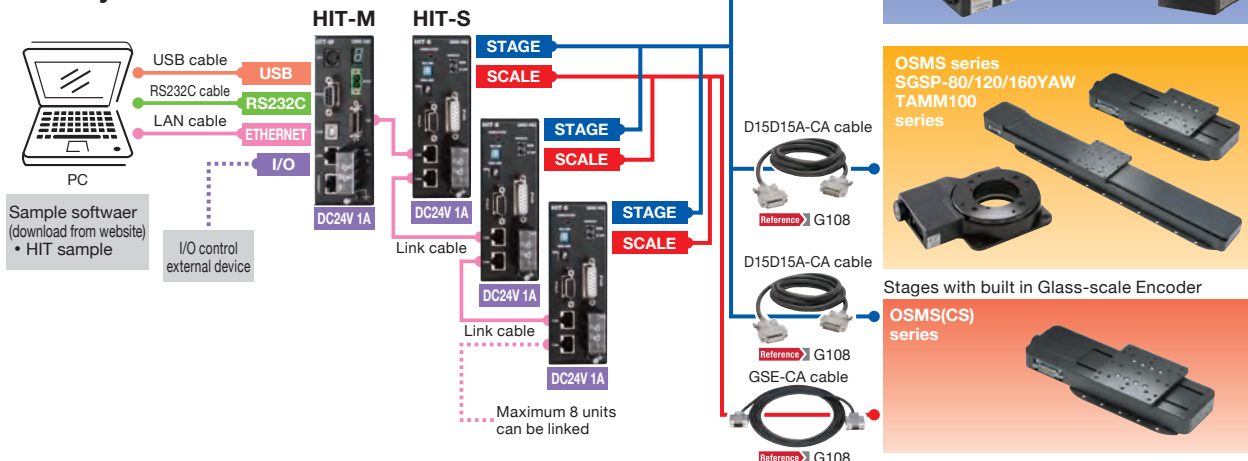
I/O Specification

Origin Sensor	○
Proximity Sensor	○
CW (+) Limit	○
CCW (-) Limit	○
General Purpose Input	4 points
General Purpose Output	4 points
Control Input	—
Control Output	—
Trigger Output	—

Control Command

Machine Origin Return	○
Theoretical Origin Setting	○
Relative Position Drive	○
Absolute Position Drive	○
Jog Operation	○
Position Appointment	—
Circular Interpolation Control	○
Linear Interpolation Control	○
Drive	○
Deceleration Stop	○
Emergency Stop	○
Speed Setting	○
Motor Free/Hold	○
Port Input	○
Port Output	○

HIT System Chart



Pulse Generating Controller | PGC-04

A 4-axis pulse generator type controller that can be connected to the various motor drivers.

- External control with USB and Ethernet interfaces are available.
- Can be manually operated by a Handy Terminal (JS-300, JB-400, JD-100).



Guide

- ▶ Sample programs are available for download from our website.
 - SGCommander 32/64-bit version for Windows® (only for RS232C)

Attention

- ▶ Cable and motor driver are sold separately. Please purchase 5-phase stepping motor drivers SG-55M or prepare compatible driver of customer choice.
- ▶ Power supply is DC+24V 2A. You need to purchase the PAT-001-POW1 (AC adapter) or prepare an adapter separately.

Products Name	Part Number
Pulse Generating Controller	PGC-04
Joystick Terminal	JS-300
Jog Operation Box	JB-400
Jog Dial	JD-100
AC Adapter	PAT-001-POW

Primary Functions

Controller Function	<input type="radio"/>
Number of Control Axes	4
Stored Program Control	<input type="radio"/>
Feedback Control	—
Circular Interpolation Control	<input type="radio"/>
Linear Interpolation Control	<input type="radio"/>
Driver Function	—
Micro-step (Max. Division)	—
Driving Current (A/phase)	—

General Specifications

Power Voltage	DC24V
Power Consumption	1.4A
Operating Temperature	5 – 40°C
Storage Temperature	—
Ambient Humidity	20 – 80%RH
External Dimensions (W×H×Dmm)	180×140×60
Weight (kg)	1.3

Interface

GP-IB	—
RS232C	<input type="radio"/>
USB	—
Ethernet	<input type="radio"/>

Optional

CJ-200A	—
JS-300	<input type="radio"/>
JB-400	<input type="radio"/>
JD-100	<input type="radio"/>
SJT-02	—

Performance Specifications

Coordinate Indication Range	—
Max. Travel to Set	16,777,215
Max. Driving Speed (pps)	4,000,000
Min. Driving Speed (pps)	1
Acceleration/Deceleration Time (ms)	1 – 1,000

I/O Specification

Origin Sensor	<input type="radio"/>
Proximity Sensor	<input type="radio"/>
CW (+) Limit	<input type="radio"/>
CCW (-) Limit	<input type="radio"/>
General Purpose Input	4 points
General Purpose Output	4 points
Control Input	—
Control Output	—
Trigger Output	—

Control Command

Machine Origin Return	<input type="radio"/>
Theoretical Origin Setting	<input type="radio"/>
Relative Position Drive	<input type="radio"/>
Absolute Position Drive	<input type="radio"/>
Jog Operation	<input type="radio"/>
Position Appointment	—
Circular Interpolation Control	<input type="radio"/>
Linear Interpolation Control	<input type="radio"/>
Drive	—
Deceleration Stop	<input type="radio"/>
Emergency Stop	<input type="radio"/>
Speed Setting	<input type="radio"/>
Motor Free/Hold	<input type="radio"/>
Port Input	<input type="radio"/>
Port Output	<input type="radio"/>

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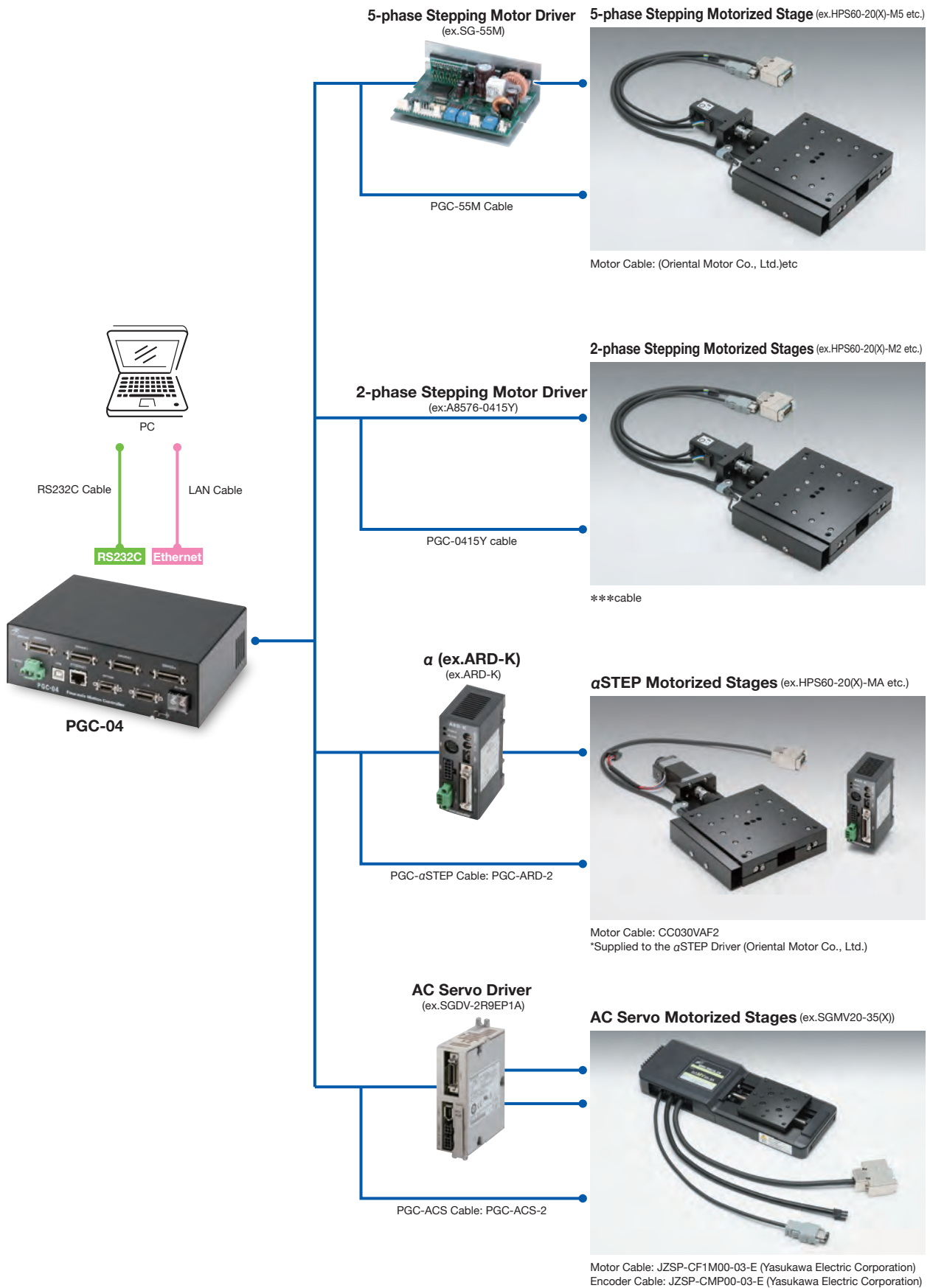
Vacuum

Options

 40mm 60mm 80mm 85mm 100mm 120mm

Others

System Diagram



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- 100mm
- 120mm
- Others

Joystick Terminal Jog Dial

SJT-02
JD-100

SJT-02

Catalog Code **W9049**

A dedicated joystick terminal for the GSC-02 controller to manually operate a motorized stage. Internal program memory allows automatic operation without using a PC.



General Specifications

Power Supply	DC+24V Supplied from a 2 axis stage controller (GSC-02/SHOT-602).
Operating Temperature	5 – 40°C
Ambient Humidity	20 – 80%RH (without condensation)
External Dimensions	(W)94 × (H)30 × (D)140mm
Weight	560g (including a special cable)
Display	LDC 16 digits, 2 lines
Connecting Cable	Attached special connecting cable (detachable)

Performance Specifications

Number of Control Axes	2 axes
Operation Mode	MANUAL (M) / TEACHING (T) / RUN (R) EDIT (E) / MEM SW SET Mode
Coordinate Indication Range	X axis: Approx. -99999999 – +99999999 pulses Y axis: Approx. -99999999 – +99999999 pulses
Coordinate Input Range	X axis: Approx. -16777214 – +16777214 pulses Y axis: Approx. -16777214 – +16777214 pulses
Limit Sensor Status	X axis: Displayed left side of coordinate symbol ("L" is displayed when detected.) Y axis: Displayed left side of coordinate symbol ("L" is displayed when detected.)
Speed Parameter	Switchable among 10 steps
Min. Driving Speed	(S) 1 – 20000pps
Max. Driving Speed	(F) 1 – 20000pps
Acceleration /Deceleration Time	(R) 0 – 1000mS
Coordinate Display Unit	[PLS] [μm] [°]
Program Memory Capacity	128 steps × 4 channels
Program Parameter	Wait time 0 – 25.5 [sec] Unit: 0.1 sec Repeated 0 – 99999999 [times]
Origin Return Axes	X axis only / Y axis only / Both axes
Motor Rotation Direction	X axis: Positive (POS) / Negative (NEG) Y axis: Positive (POS) / Negative (NEG)

Attention

- ▶ Pin 1 of GSC-02 connector for use with the SJT-02 has an electrical output of +24V. Under no circumstances should it be connected to a PC. Although it has a protective circuit, be sure to disconnect either RS232C or SJT-02, otherwise there is a risk of damage.
* If RS232C and SJT-02 are connected at the same time, neither of them will function.

Specifications

Part Number	SJT-02
Type	Joystick
Power Supply	Supplied from controller
Display	LCD (16 digits × 2 lines)
External Dimensions [W×H×Dmm]	94×30×140
Weight [kg]	0.45

JD-100

Catalog Code **W9085**

Manual operation of motorized stages is possible using the JOG buttons or JOG dial. The RATE button allows easy switching of the travel per click (2 steps). Mode switching between SHOT-302GS/SHOT-304GS and switching of travel speed (4 steps) can be performed at hand.



Functions

LCD Panel	None
MODE Button	Switches between SHOT-302GS/SHOT-304GS modes.
RATE Button	Changes the travel per click. (Normal RATE: 1 pulse/click, High RATE: 5 pulses/click)
AXIS-SEL Button	Switches the motion axes (1 to 4 axes) using the jog dial.
SPEED Button	Switches the travel speed in 4 steps set with the controller.
JOG+/- Button	Operates in +/- direction while the respective button is being pressed.

Specifications

Part Number	JD-100
Type	Jog Dial
Cable	MDR14-CA-2.5 (purchase separately)
Display	None
External Dimensions [W×H×Dmm]	130×36×145
Weight [kg]	0.6

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40mm

60mm

80mm

85mm

100mm

120mm

Others

A dedicated joystick terminal for the GSC-02 controller to manually operate a motorized stage. Internal program memory allows automatic operation without using a PC.

JS-300



- Allows easy manual operation of a motorized stage using a joystick.

Specifications

Part Number	JS-300
Type	Button operation
Cable	MDR14-CA-2.5 (purchase separately)
Display	LCD (16 digits × 4 lines)
External Dimensions [W×H×Dmm]	120×50×160
Weight [kg]	0.7

Functions

LCD Panel	Display digits: 16 digits × 4 lines
MODE Button	Switches modes (SHOT-302GS/SHOT-304GS)
E-ORG Button	Returns to theoretical (electric) origin
ZERO Button	Sets theoretical (electric) origin
Control Axis Switch Button	Switches the operating axis of joystick (1, 2 or 3, 4 axes) (Enabled only for SHOT-304GS)
Joystick	Joystick Controls 1, 2 or 3, 4 axes
M-ORG Button	Machine Origin Return
Third axis Operating Switch	Operates third axis
SPEED Button	Switches the travel speed (4 stages) set with SHOT-302GS/SHOT-304GS
STOP Button	Emergency stop

JB-400



- Enable manual operation of motorized stages. It also has a program function.

Specifications

Part Number	JB-400
Type	Button operation
Cable	MDR14-CA-2.5 (purchase separately)
Display	LCD (16 digits × 4 lines)
External Dimensions [W×H×Dmm]	178×38×195
Weight [kg]	0.7

Functions

LCD Panel	Display digits: 16 digits × 4 lines	
Program Button	Executes SHOT-302GS/SHOT-304GS internal programs	
SPEED Button	Switches the travel speed (4 stages) set with SHOT-302GS/SHOT-304GS	
MODE Button	Switches between SHOT-302GS/SHOT-304GS models	
ORG X/Y Button	Returns X/Y axis to machine origin	
Reset X/Y Button	Sets theoretical (electric) origin of X/Y axis	
STOP Button	Emergency stop	
JOG/Pulse Button	Switches between JOG operation and fixed pulse operation	
X axis / Y axis Control Button	When set to JOG operation: Move while the button is being pressed	When set to fixed pulse operation: Move for the registered number of pulses at each press of the button
CLEAR Button	Resets the fixed pulse setting to zero	
Numeric Keypad (0 - 9)	Inputs the number of fixed pulse	
SET Button	Completes setting of fixed pulse	

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40mm

60mm

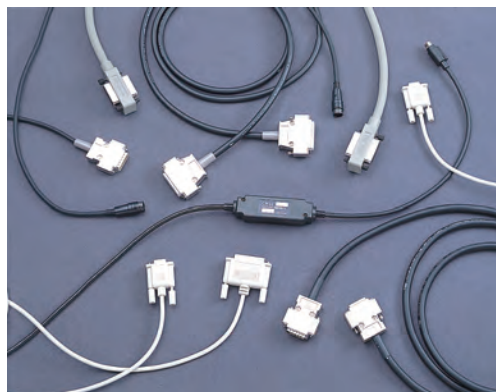
80mm

85mm

100mm

120mm

Others



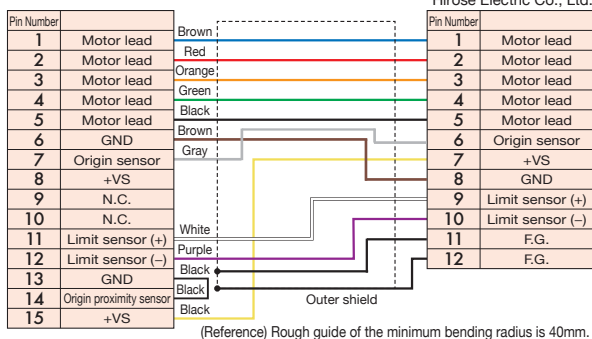
Cables for connecting between motorized stages and controllers or drivers. Select cables according to control methods or operating environments.

- Refer to compatible controllers/drivers and cables described on the page of each motorized stage.

D15RP-CA Cable

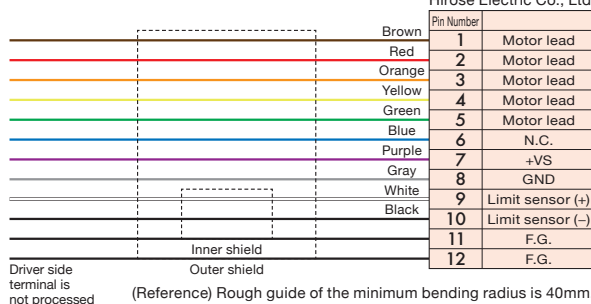
Controller side (15 pins)
D-sub15pin
(Male Type)

Stage side (12 pins)
RP17-13PA-12PC
(Male Type)
Hirose Electric Co., Ltd.



MINI-CA-SG Cable

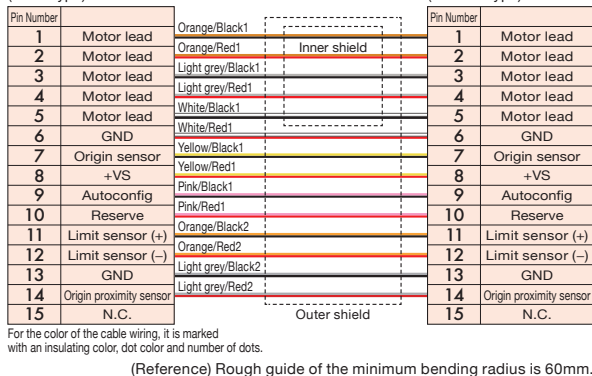
Stage side (12 pins)
RP17-13PA-12PC
(Male Type)
Hirose Electric Co., Ltd.



D15D15A-CA Cable

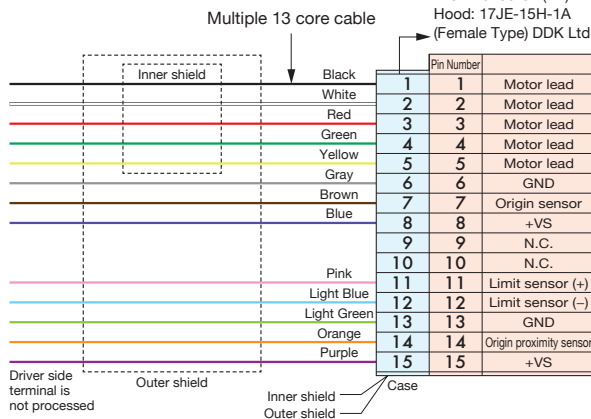
Controller side (15 pins)
17JE-23150-02(D1)
(Male Type) DDK Ltd.

Stage side (15 pins)
17JE-13150-02(D1)A
(Female Type) DDK Ltd.



DAC-SG Cable

Stage side (15 pins)
17JE-13150-02 (D1)
Hood: 17JE-15H-1A
(Female Type) DDK Ltd.



Specifications

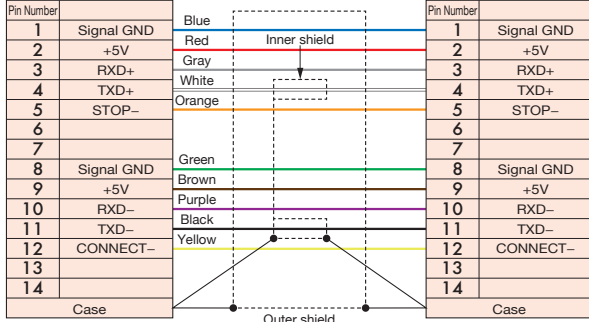
Part Number	Controller Side	Stage Side	Cable Length [m]
D15RP-CA-2	D-sub 15pin / male type	RP17-13PA-12PC / 12pin	2
D15RP-CA-3	D-sub 15pin / male type	RP17-13PA-12PC / 12pin	3
D15RP-CA-5	D-sub 15pin / male type	RP17-13PA-12PC / 12pin	5
MINI-CA-SG-1	Unprocessed	RP17-13PA-12PC / 12pin	1
MINI-CA-SG-2	Unprocessed	RP17-13PA-12PC / 12pin	2
MINI-CA-SG-3	Unprocessed	RP17-13PA-12PC / 12pin	3
MINI-CA-SG-4	Unprocessed	RP17-13PA-12PC / 12pin	4
MINI-CA-SG-5	Unprocessed	RP17-13PA-12PC / 12pin	5
D15D15A-CA-2	17JE-23150 / male type	17JE-13150 / female type	2
D15D15A-CA-3	17JE-23150 / male type	17JE-13150 / female type	3
D15D15A-CA-5	17JE-23150 / male type	17JE-13150 / female type	5
DAC-SG-2	Unprocessed	17JE-13150 / female type	2
DAC-SG-3	Unprocessed	17JE-13150 / female type	3
DAC-SG-4	Unprocessed	17JE-13150 / female type	4
DAC-SG-5	Unprocessed	17JE-13150 / female type	5

Cables for precision motorized stages with built in glass-scale encoder.

MDR14-CA-2.5 Cable

Controller side (14 pins)
Connector: 10114-3000PE
Shell: 10314-52F0-008
Sumitomo 3M Limited

Stage side (14 pins)
Connector: 10114-3000PE
Shell: 10314-52F0-008
Sumitomo 3M Limited



- The MDR14-CA-2.5 cable is for connecting between SHOT-302GS/ 304GS/SHOT-702 and JS-300/JB-400.

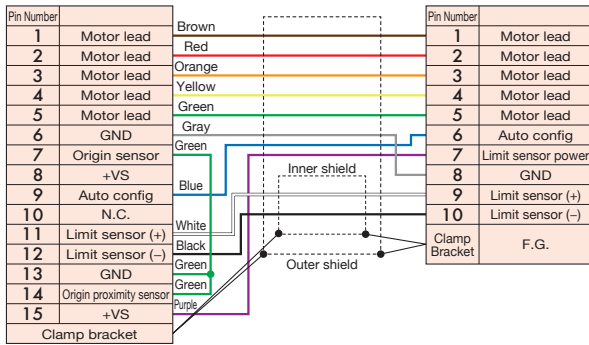
Specifications

Part Number	Controller Side	JS/JB side	Cable Length [m]
MDR14-CA-2.5	10114-3000PE	10114-3000PE	2.5

DHR-CA-3 Cable

Controller side (15 pins)
Connector: 17JE-23150-02(D1)
Hood: 17JE-15H-1A-CF
(Male Type) DDK Ltd.

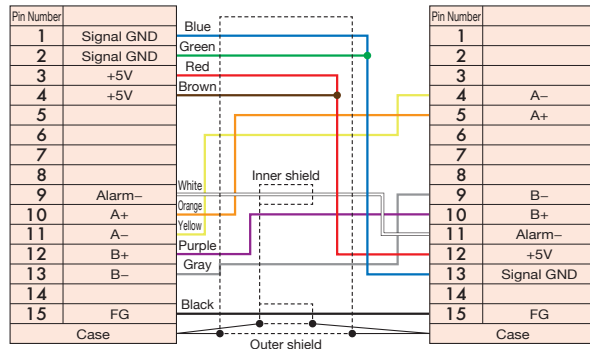
Stage side (10 pins)
HR10A-10P-10PC(73)
(Male Type)
Hirose Electric Co., Ltd.



GSE-CA-3 Cable

Controller side (15 pins)
Connector: D02-M15SG-N-F1
Hood: DE-C8-J9-F1-1R
(Male Type)
Japan Aviation Electronics Industry, Ltd.

Stage side (15 pins)
Connector: D02-M15SG-N-F0
Hood: DE-C8-J9-F1-1R
(Female Type)
Japan Aviation Electronics Industry, Ltd.

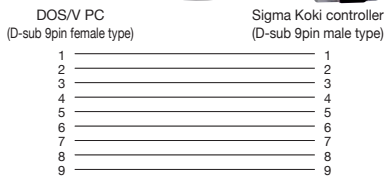


Specifications

Part Number	Controller Side	Stage Side	Cable Length [m]
GSE-CA-3	D02-M15SG-N-F1	D02-M15SG-N-F0	3
GSEF-CA-3	D02-M15SG-N-F1	D02-M15SG-N-F0 (with ferrite core)	3

Other Cables

RS232C Cable



Specifications

Part Number	Cable Length [m]
RS232C/STR-1.8	1.8
RS232C/STR-3	3
RS232C/STR-4.5	4.5

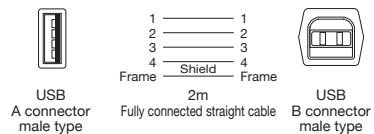
GP-IB Cable



Specifications

Part Number	Cable Length [m]
GP-IB-0.5	0.5
GP-IB-1	1
GP-IB-2	2
GP-IB-3	3
GP-IB-4	4

USB Cable



Specifications

Part Number	Cable Length [m]
USB-1	1
USB-2	2

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm
- Others

Maintenance

Catalog Code W9005

To maintain smooth operation, grease condition needs to be inspected and checked periodically and grease needs to be supplied if necessary.

Use of grease will prevent rust, extending product life cycle significantly.

**Effect of Grease**

Minimizes friction to enable smooth drive.

Grease Up Method

- ① Wipe off old grease.
 - ② Pour grease to supply in a syringe or the like.
 - ③ Move the entire travel several times to apply grease thoroughly.
 - ④ Wipe off grease that runs over in step ③.
- * Too much grease will cause dust to adhere. Wipe the excess grease clean.

Guide

- ▶ We will perform filling of grease (charged separately). Contact our International Sales Division for more information.

Attention

- ▶ Handling of grease requires attention. Avoid contamination with foreign substances, mixing with different type of grease or air, and heat treatment.

Specifications

Part Number	AFA	AFB
Motorized Stages Used	SGSP15 Series SGSP20 Series SGSP26 Series	SGSP33 Series SGSP46 Series SGSP65 Series TAMM
Manufacturer	THK CO., LTD.	THK CO., LTD.
Operating Temperature Range [°C]	-45 ~ +160	-15 ~ +100

Replacement of Grease

Catalog Code W9006

Grease used for motorized stages can be replaced with grease for clean room environments or grease for vacuum applications.

Replacement Sites

Motorized stage : Ball screw part, crossed roller part (TSDM/TAMM series)

Always contact our International Sales Division since grease used for each component (guide part / screw part) is different.

Rotation stage : Cannot be replaced by customers. Contact our International Sales Division for more information.

Goniometer stage: Cannot be replaced by customers. Contact our International Sales Division for more information.

(Always contact our International Sales Division since grease used for each component is different for goniometer stages.)

Features**Low dust generation grease for clean room environments**

Reduces burden for maintenance since it is hard to deteriorate and has long life.

It may lose fluidity and get hard suddenly in low-temperature environments.

Fomblin Vacuum Grease

Has excellent heat resistance, lubricity and compatibility with other materials.

It has long life and is usable in high temperature (-20°C ~ +250°C).

Specifications

Part Number	AFE-GREASE-C	YVAC-GREASE-C
Number of Axes [axis]	1	1
Manufacturer	THK CO., LTD.	Solvay Solexis
Name	Low dust generation grease for clean room environments	Fomblin Vacuum Grease
Part Number	AFE	YVAC
Operating Temperature Range [°C]	-40 ~ +120	-25 ~ +250

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 40mm 60mm 80mm 85mm 100mm 120mm

Others

Motorized Stage System Question Sheet

Quotation Order

Date

To: Sigma Koki Co., Ltd. **FAX +81-3-5638-6550**

Affiliation <small>(Organization Name)</small>					
Department			Name		
TEL		FAX		E-mail	
Country/Address					
Project Name <small>(Tentative name is okay)</small>					
Drawing number			Estimate	<input type="checkbox"/> Yes: by Date <input type="checkbox"/> No	
Desired Delivery Date			Budget	JP Yen	
Quantity			Part Number	<small>Fill in this column if you desire to modify a product listed on the catalog or if you have a base product.</small>	
Usage		<input type="checkbox"/> Research and development <input type="checkbox"/> For incorporation <small>(equipment / production)</small>		Axis Direction	<input type="checkbox"/> X axis <input type="checkbox"/> XY axis <input type="checkbox"/> Z axis <input type="checkbox"/> Combination
Weight of Sample, etc.			Changing Travel <small>(changing limit sensor position)</small>		
Table Size		mm	Travel	mm	
Number of Axes			Load Capacity	kgf	
Resolution		(Full)	Positioning Accuracy		
		(Half)	Positional Repeatability		
Changing Motor <input type="checkbox"/> Electromagnetic brake <input type="checkbox"/> Reduction gear <input type="checkbox"/> Other (AC servo)					
Others <small>* Write more detailed specifications here. (Rough illustration is acceptable.)</small>					

Sigma Koki Co., Ltd.

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40mm

60mm

80mm

85mm

100mm

120mm

Others

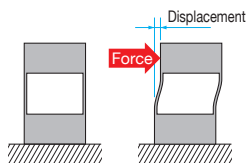
Piezo Guide

For the guide mechanism, Sigma fine stages adopted a guide system that utilizes elastic deformation of metals and a mechanism to increase deformation of piezo elements. These originally designed stages achieved readable resolution of 10nm during closed loop control, ideal for uses that require high-speed high-precision positioning.

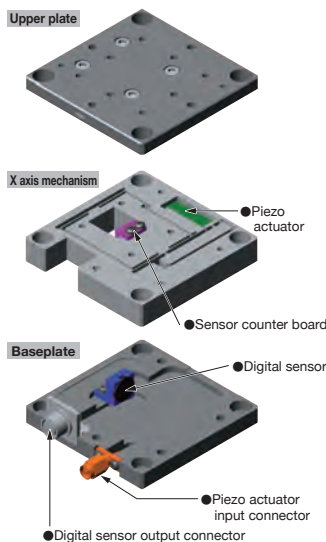
Structure of Sigma Fine Stage

Displacement Magnification Method

Piezo actuator and displacement magnification mechanism offer a large operating range.



SFS-H Internal Structural Drawing



Digital Sensor

Closed loop control is possible with a digital sensor that does not require any high precision analog amplifier or AD conversion circuit.

Operating Environment of Sigma Fine Stage

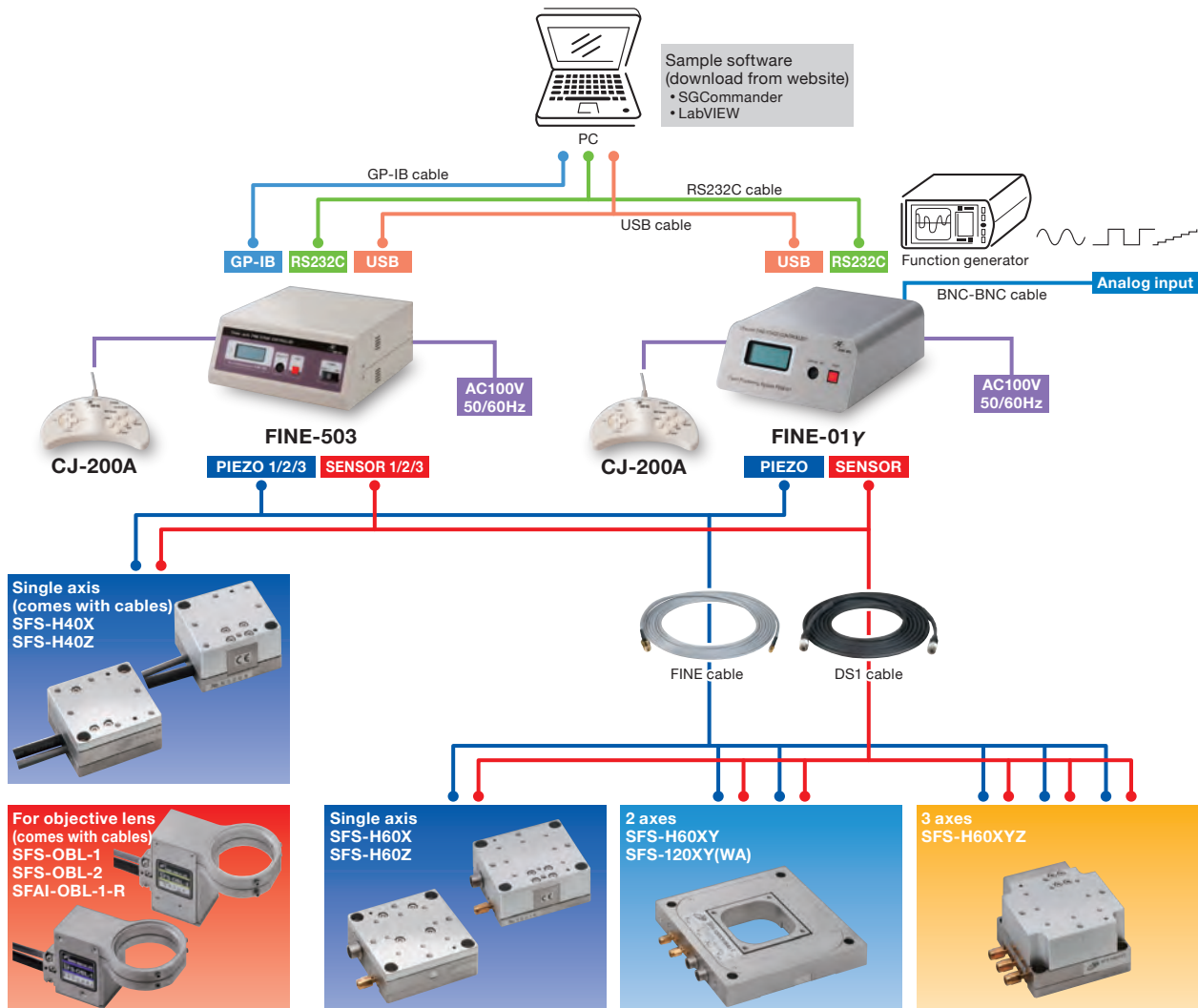
Use fine stages within the following operating environment temperature range. Contact us separately if you desire to use the stages outside the operating environment temperature range.

***Operating environment**
 Temperature: 10°C – 30°C
 Humidity: 20% – 60%
 (without condensation)

***Recommended environment**
 Temperature: 20°C ±1°C
 Humidity: 40% or lower

Since durability of piezo elements used in the SFS/SFS-H stage series will deteriorate in high humidity environments, use them in the above environments.

Sigma Fine System Chart



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40mm

60mm

80mm

85mm

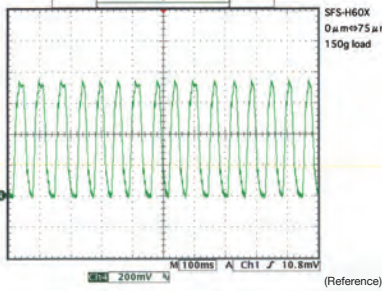
100mm

120mm

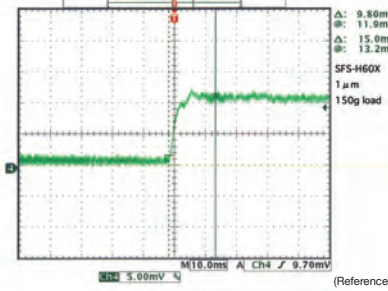
Others

Accuracy Measurement Example: Sigma Fine Stage System SFS-H (Linear Stage)

High Speed Convergence Data



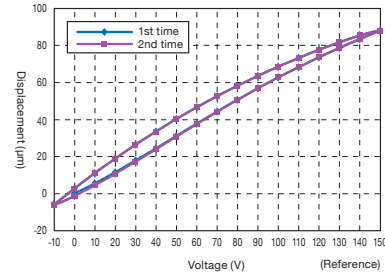
0 ⇄ 75µm pulse rate (16Hz)
Closed loop control
by SFS-H60X at 150g load



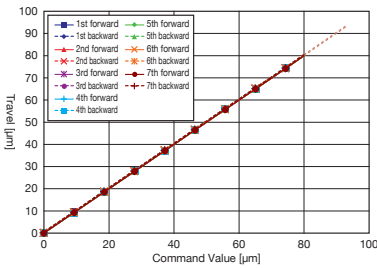
0 ⇄ 1µm step convergence data (15msec)
Closed loop control
by SFS-H60X at 150g load

Travel

The following graph shows the hysteresis curve unique to piezo actuators during open loop control travel.

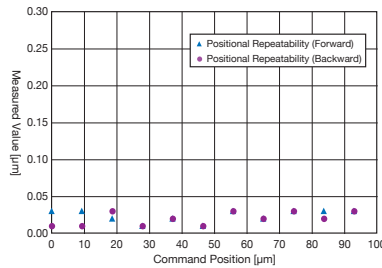


Linearity



0 ⇄ 80µm linearity within 0.3%
Closed loop control
by SFS-H60X at 150g load

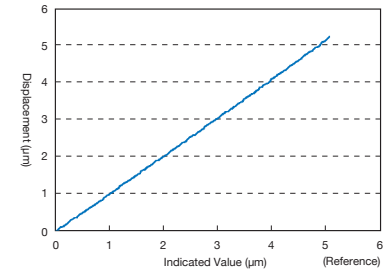
Positional Repeatability



0 ⇄ 80µm positional repeatability 50nm or lower
by SFS-H60X at 150g load

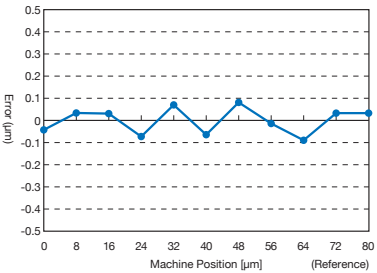
Characteristics of Fine Feed

Characteristics when feed amount is small in closed loop control. Hysteresis disappears in open loop control.



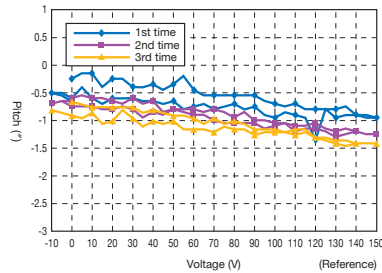
Straightness

Deviation from the straight line in the direction of travel.



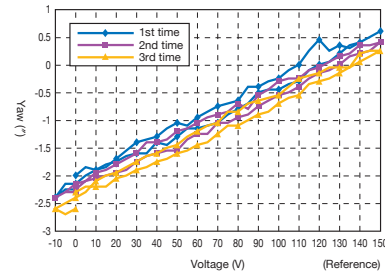
Pitch

Tilt around the axis in the horizontal plane perpendicular to the direction of travel.



Characteristics of Yaw

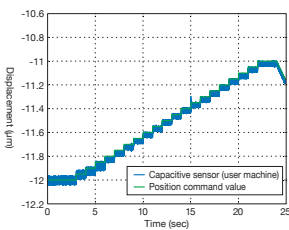
Rotation around the axis in the vertical plane perpendicular to the direction of travel.



Follow-up example with Respect to Analog Input: SFS-H (Linear Stage) *Controlled by FINE-01γ

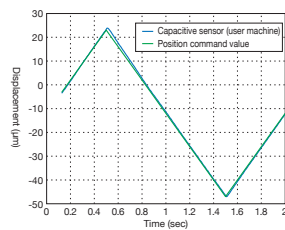
High Speed Convergence Data

Input waveform: Navy/Output waveform: Light blue



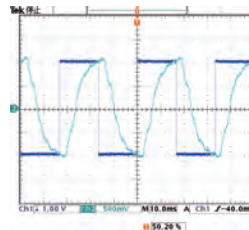
SFS-H40X

Staircase wave input/output waveforms
(Step 50nm 20-step staircase wave)



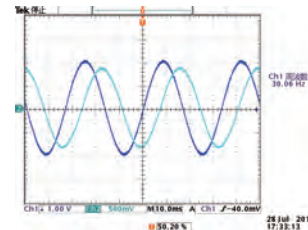
SFS-H40X

Saw-tooth wave input/output waveforms
(Uniform motion 35µm/1Hz)



SFS-H40X

Rectangular wave input/output (30Hz)



SFS-H40X

Sine wave input/output (30Hz)

Sigma Fine (Piezo) Stages (high stiffness type) XY Piezo Stages Aperture Type

SFS-H
SFS-120XY(WA)



These piezo stages achieved fine movement of theoretical resolution of 1nm, offering high precision, high stiffness and high speed with adoption of digital sensors.

SFS-H

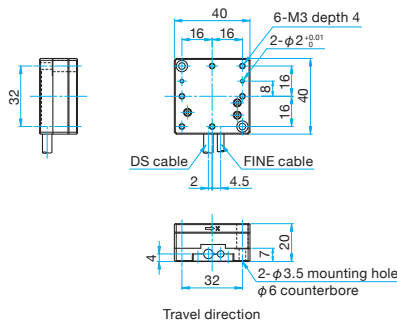


- These piezo stages offer high precision and high resolution positioning because full closed loop control is possible with digital sensors.
- With piezo elements used as actuators, travel between 90µm – 100µm in open loop control, and fine movement of theoretical resolution of 1nm are possible.
- Readable resolution of 10nm is achieved during full closed loop control with adoption of a digital sensor (micro-displacement sensor based on the frequency digital conversion method) used as position detection sensors.
- Sigma Koki controller FINE series offers high speed. [Reference](#) G117 Regarding pulse rate, SFS-H (linear) achieved 10 – 15Hz, or 25Hz when the current FINE-01γ analog input is used.

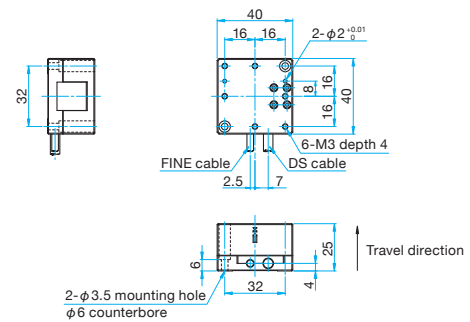


Outline Drawing

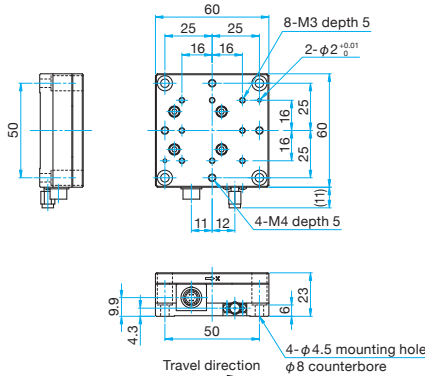
SFS-H40X(CL) Hexagon socket head cap screw M3×10...2 screws



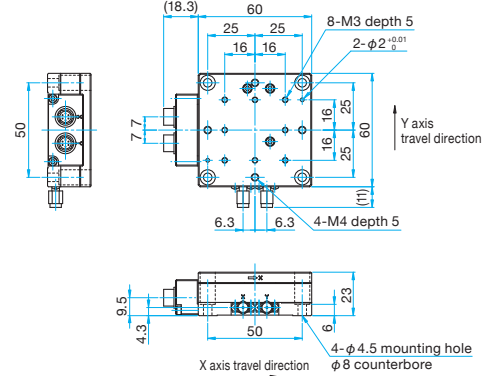
SFS-H40Z(CL) Hexagon socket head cap screw M3×10...2 screws



SFS-H60X(CL) Hexagon socket head cap screw M4×10...4 screws



SFS-H60XY(CL) Hexagon socket head cap screw M4×10...4 screws



Specifications

Part Number	SFS-H40X(CL)	SFS-H40Z(CL)	SFS-H60X(CL)	SFS-H60XY(CL)
Travel	90µm±15%	100µm±15%	100µm±15%	100µm±15%
Table Size [mm]	40×40	40×40	60×60	60×60
Actuator	Piezo actuator	Piezo actuator	Piezo actuator	Piezo actuator
Weight [kg]	0.28	0.28	0.4	0.43
Theoretical Resolution (open-loop) [nm]	1	1	1	1
Resolution (closed-loop) [nm]	10	10	10	10
Linearity [%]	0.3 or lower	0.3 or lower	0.3 or lower	0.3 or lower
Perpendicularity (Horizontal Direction) [µm]	1	1	1	1
Positional Repeatability [µm]	0.1 or lower	0.1 or lower	0.1 or lower	0.1 or lower
Load Capacity [N]	9.8 (1.0kgf)	6.7 (0.7kgf)	19.6 (2.0kgf)	14.7 (1.5kgf)
Micro-displacement Sensor	Digital Sensor	Digital Sensor	Digital Sensor	Digital Sensor
Compatible Cable	Attached cable (2m)	Attached cable (2m)	FINE-CA-3: For piezo DS1-CA-3: For digital sensor	FINE-CA-3: For piezo DS1-CA-3: For digital sensor

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80mm

85mm

100mm

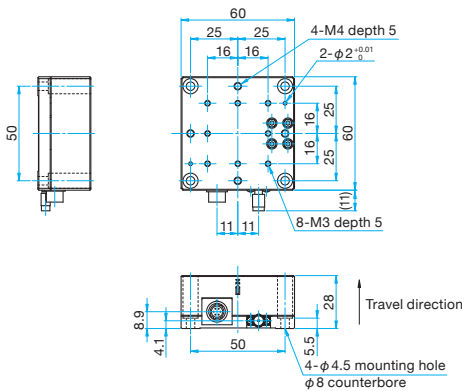
120mm

Others

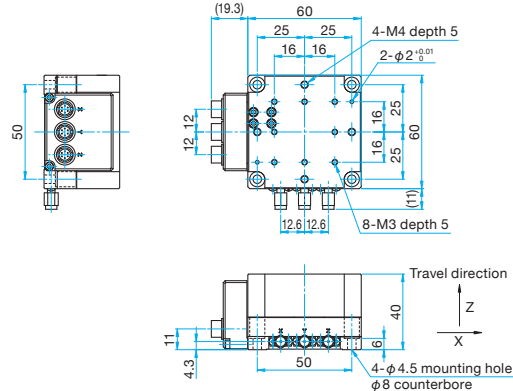


Outline Drawing

SFS-H60Z(CL) Hexagon socket head cap screw M4x10...4 screws

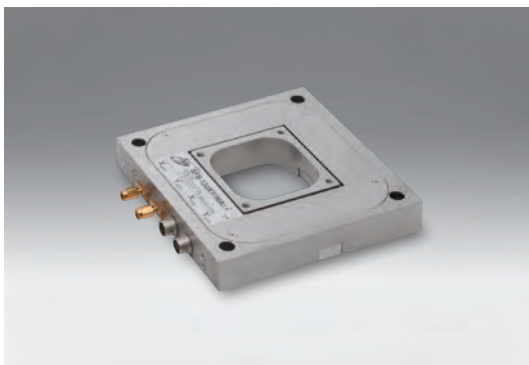


SFS-H60XYZ(CL) Hexagon socket head cap screw M4x10...4 screws



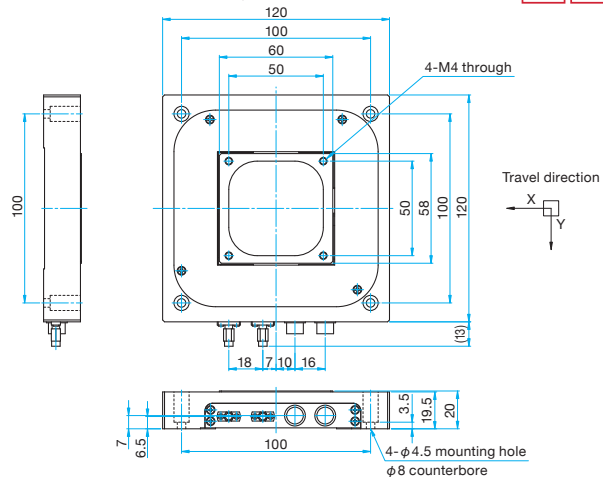
SFS-120XY(WA)

- A high precision positioning XY axis stage with 50x50mm aperture fitted with a piezo element as an actuator and digital sensor for position feedback, suitable for fine movement of samples under a microscope.
- Can be driven with the Sigma fine stage controller FINE-503. Since the controller supports RS232C, GP-IB (FINE-503 only) and USB interfaces, position control can be performed easily from a PC using the software for positioning & measurement SGEMCSE, SGTERME and SGSFSXE.
- Ideal for applications such as incorporation into various types of microscopes, precision measurement, semiconductor test equipment, high-precision mask alignment, scanning interferometer, image processor, and biotechnology systems.



Outline Drawing

SFS-120XY(WA) Hexagon socket head cap screw M4x8...4 screws



Specifications

Part Number	SFS-H60Z(CL)	SFS-H60XYZ(CL)	SFS-120XY(WA)
Travel	100μm±15%	100μm±15%	100μm±10%
Table Size [mm]	60x60	60x60	120x120
Actuator	Piezo actuator	Piezo actuator	Piezo actuator
Weight [kg]	0.33	0.63	1.2
Theoretical Resolution (open-loop) [nm]	1	1	1
Resolution (closed-loop) [nm]	10	10	10
Linearity [%]	0.3 or lower	0.5 or lower	—
Perpendicularity (Horizontal Direction) [μm]	1	1	1 or lower
Positional Repeatability [μm]	0.1 or lower	0.15 or lower	0.1 or lower
Load Capacity [N]	9.8 (1.0kgf)	9.8 (1.0kgf)	19.6 (2.0kgf)
Micro-displacement Sensor	Digital sensor	Digital sensor	Digital sensor
Compatible Cable	FINE-CA-3: For piezo DS1-CA-3: For digital sensor	FINE-CA-3: For piezo DS1-CA-3: For digital sensor	FINE-CA-3: For piezo DS1-CA-3: For digital sensor

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Options

□40mm

□60mm

□80mm

□85mm

□100mm

□120mm

Others

Piezo Actuator for Objective Lens

SFS-OBL (Upright)/SFAI-OBL (Inverted)



Catalog Code **W9056**

Objective lens actuator for inverted microscope employing a piezo element as actuator and digital sensor for feedback.

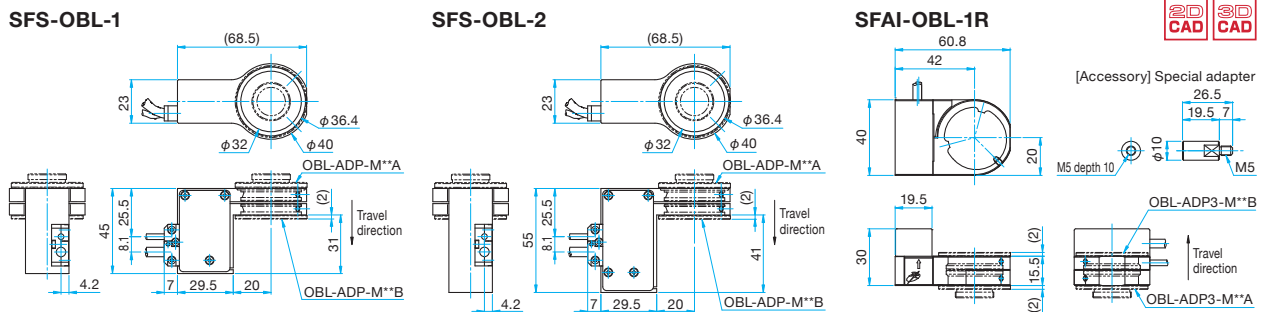


- Compact, and enabling high-speed high-resolution positioning.
- Travel is 100µm at open loop.
- Two types of erected model and inverted model are available for incorporation into various types of microscopes.
- In the case of the Sigma fine stage series, these actuators can be driven with the controller (FINE-01γ/503(CL)). Since RS232C, GP-IB (FINE-503 only) and USB interfaces are supported, position control can be performed easily from a PC using the software for positioning & measurement SGEMCSE, SGTERME and SGSFSXE.

Guide

- ▶ Adapters compatible with screw sizes of other manufacturers' objective lenses are also available.
- ▶ SFS-OBL-2 uses a metal enclosure type piezo actuator to improve environment resistance such as humidity compared to SFS-OBL-1.

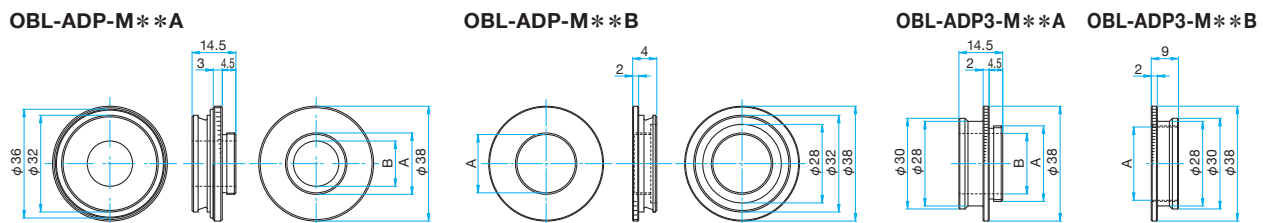
Outline Drawing



Specifications

Part Number	CE SFS-OBL-1	SFS-OBL-2	SFAI-OBL-1R
Travel	100µm±15%	100µm±15%	100µm±15%
Objective Lens Diameter [mm]	Diameter φ39 or less	Diameter φ39 or less	Diameter φ39 or less
Dimensions [mm]	(W)75.5 × (H)45 × (D)40	(W)75.5 × (H)55 × (D)40	(W)60.8 × (H)30 × (D)40
Actuator	Piezo element	Piezo element	Piezo element
Weight [kg]	0.15	0.24	0.15
Theoretical Resolution (open-loop) [nm]	1	1	about 0.8
Resolution (closed-loop) [nm]	10	10	10
Straightness (Xy Xz Yx Yz) [µm]	1 or lower	1 or lower	0.2 or lower
Positional Repeatability [µm]	0.1 or lower	0.1 or lower	0.1 or lower
Load Capacity [N]	—	—	4.9 (0.5kgf)
Micro-displacement Sensor	Digital sensor	Digital sensor	Digital sensor
Compatible Adapter	OBL-ADP-**	OBL-ADP-**	OBL-ADP3-**
Accessories	Cable (2m)	Cable (2m)	Cable (2m), four special lift spacers

Objective Lens Adapters



SFS-OBL Compatible Adapters

Part Number	Mounting Screw Size [mm]	A [mm]	B [mm]
OBL-ADP-M20.32A	Microscope side M20.32	M20.32 P=0.706 (W0.8×1/36)	15
OBL-ADP-M20.32B	Objective lens side M20.32	M20.32 P=0.706 (W0.8×1/36)	—
OBL-ADP-M25.0A	Microscope side M25.0	M25.0 P=0.75	20
OBL-ADP-M25.0B	Objective lens side M25.0	M25.0 P=0.75	—
OBL-ADP-M26.0A	Microscope side M26.0	M26.0 P=0.706 (W26.0×1/36)	21
OBL-ADP-M26.0B	Objective lens side M26.0	M26.0 P=0.706 (W26.0×1/36)	—

SFAI-OBL Compatible Adapters

Part Number	Mounting Screw Size [mm]	A [mm]	B [mm]
OBL-ADP3-M20.32A	Microscope side M20.32	M20.32 P=0.706 (W0.8×1/36)	15
OBL-ADP3-M20.32B	Objective lens side M20.32	M20.32 P=0.706 (W0.8×1/36)	—
OBL-ADP3-M25.0A	Microscope side M25.0	M25.0 P=0.75	20
OBL-ADP3-M25.0B	Objective lens side M25.0	M25.0 P=0.75	—
OBL-ADP3-M26.0A	Microscope side M26.0	M26.0 P=0.706 (W26.0×1/36)	21
OBL-ADP3-M26.0B	Objective lens side M26.0	M26.0 P=0.706 (W26.0×1/36)	—

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- 40mm
- 60mm
- 80mm
- 85mm
- 100mm
- 120mm

Others

Controllers with built-in piezo drivers for single axis / 3 axes.



FINE-01y



FINE-503(CL)

- These controllers are fitted with digital sensor input for each axis, enabling closed loop control by correcting hysteresis curve unique to piezo.
- Being connected to a PC via RS232C, GP-IB, or USB interface, the FINE-503(CL) allows control of a fine stage by simple commands sent from a PC.
- In addition to PC control via RS232C or USB interface, the FINE-01y enables high-speed control synchronized with analog signal input.

Part Name	Part Number
1 axis SFS Controller with Analog Input Function	FINE-01y
3 axes SFS Controller	FINE-503(CL)
Control Pad	CJ-200A
FINE Cable	FINE-CA-3
DS Cable	DS1-CA-3
BNC-BNC Cable	SKBNC-BNC-3.0

Primary Functions

Part Number	FINE-01y	FINE-503(CL)
Controller Function		○
Number of Control Axes	1	3
Stored Program Control		○
Feedback Control		Digital sensor

General Specifications

Power Voltage	AC100V ±10% 50/60Hz
Power Consumption	50VA
Operating Temperature	10 – 30°C
Storage Temperature	-20 – 60°C
Ambient Humidity	20 – 80%RH
External Dimensions (WxHxDmm)	225x118x250/270x118x297
Weight (kg)	3.5 5.3

Interface

GP-IB	—	○
RS232C		○
USB		○
Analog input	○	—

Optional

CJ-200A		○
SKBNC-BNC-3.0	○	—

Performance Specifications

Coordinate Indication Range	±999,999nm
Max. Travel to Set	±999,999nm

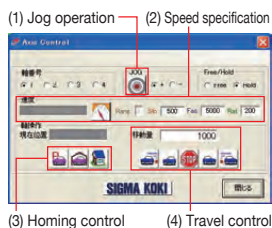
Control Command

Machine Origin Return	○
Theoretical Origin Setting	○
Relative Position Drive	○
Absolute Position Drive	○
Jog Operation	○
Position Appointment	—
Circular Interpolation Control	—
Linear Interpolation Control	—
Drive	○
Deceleration Stop	—
Emergency Stop	—
Speed Setting	○
Motor Free/Hold	—
Port Input	—
Port Output	—

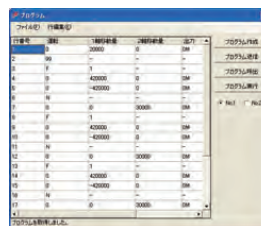
SFS Software

Free Software | SGCommander (for RS232C) Windows® Version

Free software is available to operate your controller easily from a PC. Each axis of a connected motorized stage can be moved using buttons on the screen. The software can be downloaded from our website.



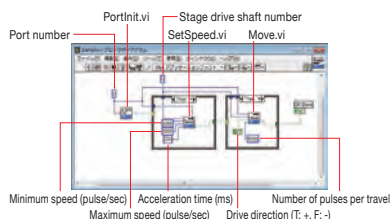
Simple operations are possible such as travel by specifying an axis, homing or jog operation.



Controllers such as SHOT-30*/702 and FINE-**, which have a built-in program function, allow editing of programs from a PC. Since data can be downloaded/uploaded from/to Excel sheets, it is easy to edit programs. In addition, upload of memory switch or download mode is available.

Free Application LabVIEW (for v.5.1/v.6i/v.7.1/v.8.6/v.2010) RS232C/GP-IB

LabVIEW application is available for LabVIEW users.



Other: 30 Day Trial Version (SGEMCSE/SGTERME)

SGEMCSE....SGEMCSE is software for collecting data or measuring using automatic positioning equipment, measuring instrument or controller, and is offered 30 days for free.

SGTERME....It allows command input using Excel for easy program making. SGTERME is ideal software to link with various devices, and is offered 30 days for free.



With Industrial Line positioners, attocube has genuinely combined highest precision piezodrive technology with extremely rugged, yet cost effective design.

- All ECS positioners of the Industrial Line are dedicated for operation at ambient temperature and depending on the model for pressures ranging from atmospheric to UHV.
- The ECS drive series features implemented crossed roller bearings and is thus specified for high loads of up to several kilograms and guiding errors of less than 0.1mrad in pitch, yaw, and roll.
- This powerful performance is supplemented by travel ranges up to 50mm, step sizes as small as 50nm, and optional position sensor for closed loop operation with 1nm resolution. Attocube's Industrial Line positioners are available in a wide variety of designs, sizes, and travel ranges and can be stacked directly on top of each other for multi axis operation.

Specifications								
Exterior								
Products Name		X axis positioner	X axis positioner	X axis positioner	Goniometer	Goniometer	Rotator	Rotator
Part Number		ECS3030	ECS3080	ECS5050	ECGt5050	ECGp5050	ECR3030	ECR5050
Closed-loop travel properties	Position Resolution	1nm	1nm	1nm	0.000001°	0.000001°	0.00001°	—
	Position Repeatability	50nm	50nm	50nm	±0.00005°	±0.00005°	±0.0005°	—
	Accuracy	< 0.01% of travel range	< 0.01% of travel range	< 0.01% of travel range	≐0.001°	≐0.001°	≐0.002°	—
Open-loop travel properties	Minimum step size	50nm	50nm	50nm	0.0001°	0.0001°	0.0004°	0.0002°
	Fine positioning range	1.6µm	1.6µm	1.6µm	0.0014°	0.0011°	0.012°	0.006°
Travel Range		20mm	50mm	30mm	10°	10°	360°	360°
Table Dimensions [mm]		30×30	30×80	50×50	50×50	50×50	30×30	50×50
Positioning Slide		Crossed Roller Bearing	Crossed Roller Bearing	Crossed Roller Bearing	Crossed Roller Bearing	Crossed Roller Bearing	Ball Bearing	Ball Bearing
Weight [kg]	Aluminum	0.029	0.078	0.070	0.137	0.137	0.28	0.1
	Stainless steel	0.051	0.147	0.247	0.247	0.247	0.66	0.215
Maximum Travel Speed		4.5mm/sec	4.5mm/sec	4.5mm/sec	≐1°/sec	≐1°/sec	≐10°/sec	≐5°/sec
Load Capacity (horizontal mounting)		9kg	24kg	15kg	1kg	1kg	2kg	2kg

* Closed-loop properties are available if "encoder option" is selected. For ordering, add suffix "/NUM" after the model number.

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Control of Industrial Line Positioners | ECC100

The three axes controller ECC100 is used for driving all ECS positioners either in open loop or closed loop mode, depending on the corresponding positioner model.



Software features

The ECC100 is delivered with a basic software package providing windows based software including LabView driver set and DLL. A dedicated software package /PRO providing enhanced controller functionality can be upgraded at any time. The /SYNC option offers the use of an Ethernet interface and allows for using the controller with Epics drivers.

Controller Hardware	
Part Number	ECC100
Chassis [mm]	about (W)210 × (H)50 × (D)210
Weight [kg]	1.9
Power supply	100/115/230V, 50–60Hz
Power consumption	max. 100W

Output Signals	
Stepping - voltage range	0 – 45V
Stepping - frequency range	0 – 5kHz (1 axis) 0 – 2kHz (3 axes simultaneously)
Stepping - maximum current	>5A Peak
Resolution of signal generation	680µV (16 bit)
Output connectors	SubD 15 connectors

- X Translation**
- Theta Rotation**
- Goniometer**
- Vacuum
- Options
 - 40mm
 - 60mm
 - 80mm
 - 85mm
 - 100mm
 - 120mm
- Others