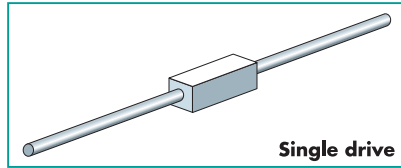


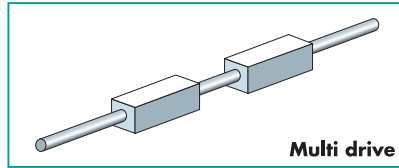
Shaft Motor Drive System

The single-shaft drive uses a control system matched to the combination of a shaft and a forcer so as to enable control system to suit the specific requirements, even for complex movement.



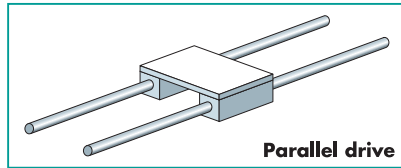
Single drive

This is the basic drive system: One servo driver drives one shaft motor. X and Y shafts can be used to create and XY stage.



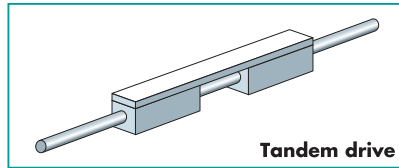
Multi drive

Multiple forcers can be driven independently on single shaft, thereby creating complex movements. Each forcer can be moved independently by an independent servo driver.



Parallel drive

Multiple forcers can be used in parallel as shown. Effective for driving large and heavy load. Multiple forcers can be driven by single servo driver.

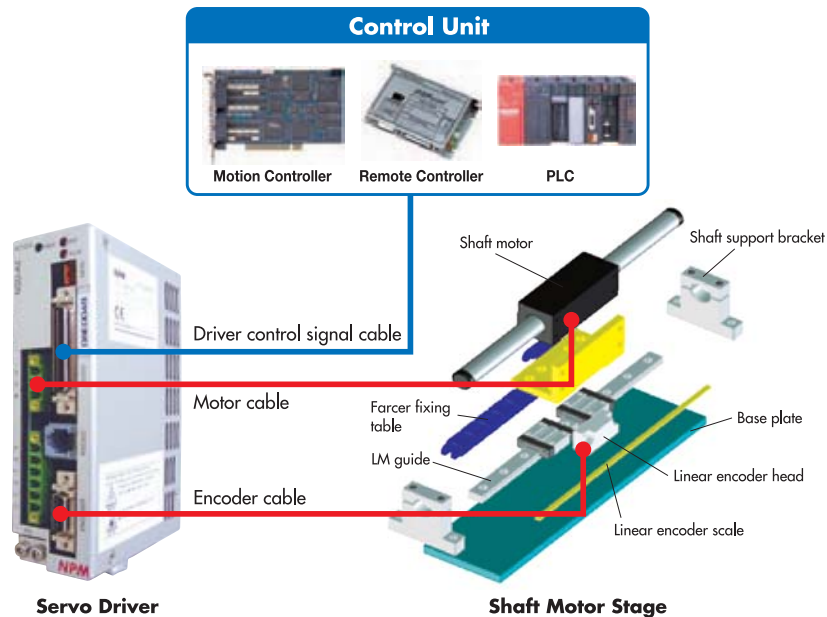


Tandem drive

Multiple forcers can be used on the same shaft in tandem as shown to multiply the thrust. Multiple forcers can be driven by single servo driver.

Shaft Motor System Diagram

The following diagram shows the typical peripheral devices and components to configure a system using the Linear Shaft Motor. The LM guide is a necessary part of a system up to the application, demand specification. If the shaft is fixed, the forcer will be moving while the shaft will be moving if the forcer is fixed in the system.



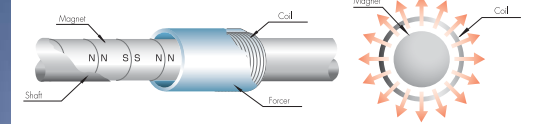
NPM NP ROBO

SLP High Performance Linear-Single Axis Stage with Shaft Motor Technologies

• The Benefits of Shaft Motors

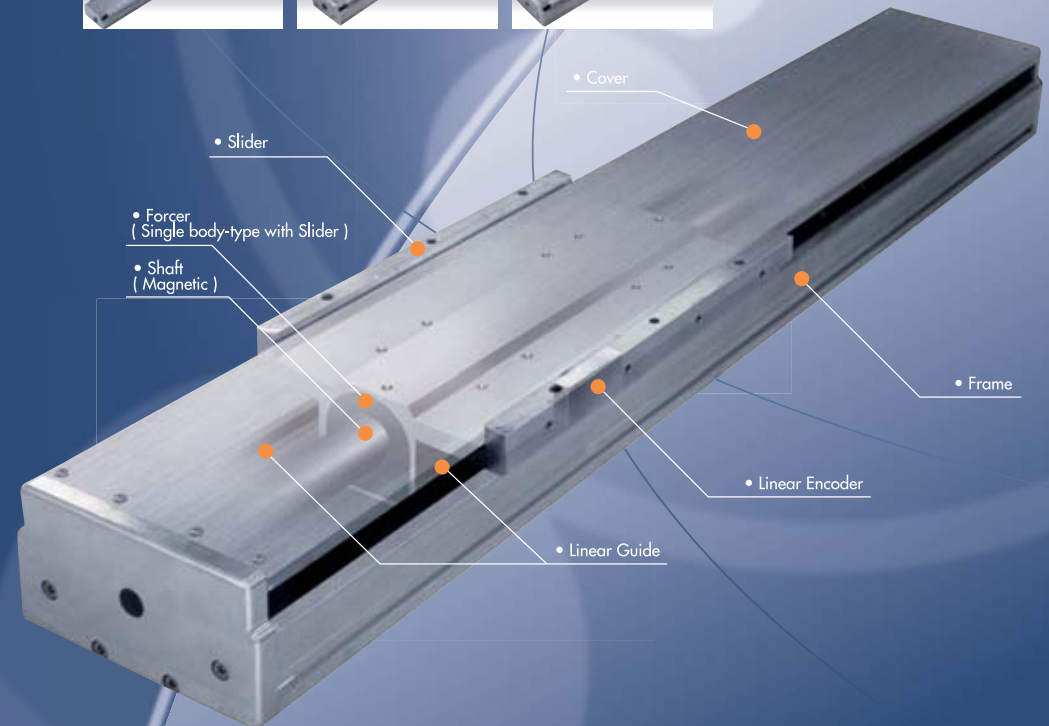
This high-precision drive unit boasts high thrust (high degree of acceleration) as well as being coreless. The coil unit catches the magnetic field generated by the NS magnet arrayed inside of the shaft (magnetic) without any waste.

• Structure



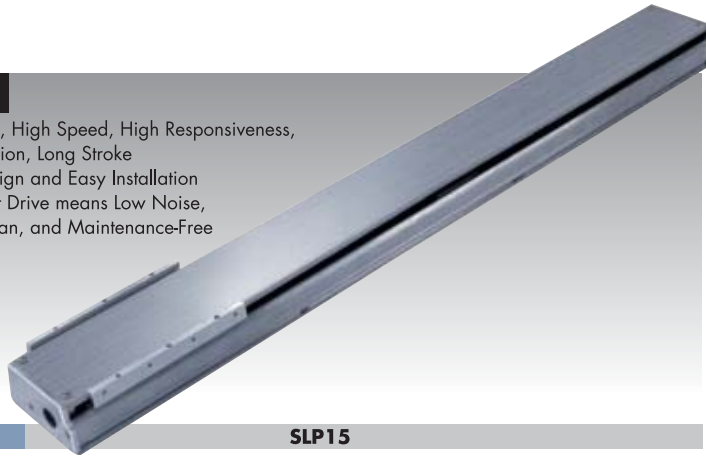
Because it can change the outer magnetic field into force in a full 360 degrees, even with a short coil length, large force is gained.

The high-quality SLP Single Axis Stage lineup meets all manner of needs.



Advantages

- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- No-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free

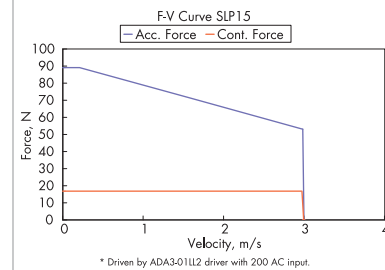


Performance

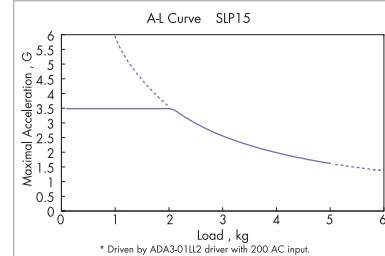
SLP15

Rated Spec	Unit	Specification	
Encoder	mm	0.001 (HEIDENHAIN IUA279)	
Continuous Force	N	17	
Peak Force	*1 N	90	
Continuous Current	*2 A	0.51	
Peak Current	*1 A	2.7	
Force Constant	N/A	33	
Back EMF	V/m/s	11	
Resistance	*3 ohm	56	
Inductance	*3 mH	24	
Magnetic Pitch (N-N)	mm	60	
Maximum Acceleration	*4 G	3.5	
Maximum Velocity	*4, *5 m/s	3	
Repeatability	mm	±0.0005	
Max load	Horizontal	kg	5
	Wall	kg	3
Stroke	Single Forcer	mm	100~1300 (100 interval)
	*6 Double Forcer	mm	100~1200 (100 interval)
Operating Temperature	°C	0~40	
Operating Humidity	%	20~80 (no condensation)	
Storage Temperature	°C	-20~60	

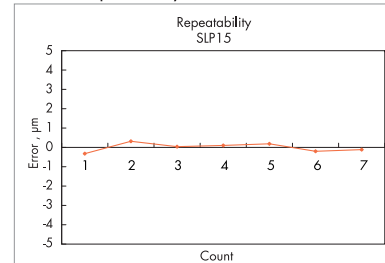
F-V Curve



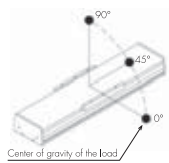
Maximum Acceleration vs. Load



Position Repeatability



Overhanging Weight Tolerance



Load	Angle		
	0°	45°	90°
1kg	380	400	450
2kg	220	250	270
3kg	160	190	200
4kg	120	140	150
5kg	100	110	130
1kg	440	390	320
2kg	260	230	180
3kg	180	170	120

Unit : mm

SLP15 Single Slider

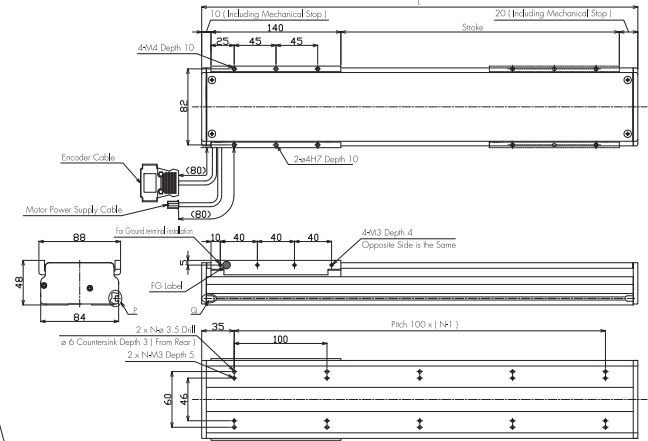
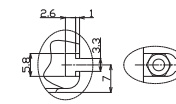
Motor Power Supply Cable Specifications

Fitachi Cable : UI2464
AWG 25
Outer dimension ϕ 4.3
JST XM Connector (Male)

Encoder Cable Specifications

Heidenhain
Outer dimension ϕ 4.3
Omron Dsub 15-pin Connector (Male)

P,Q Section Detail



Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
L (mm)	270	370	470	570	670	770	870	970	1070	1170	1270	1370	1470
N	3	4	5	6	7	8	9	10	11	12	13	14	15
Weight (kg)	1.8	2.2	2.6	3.1	3.5	4.0	4.4	4.8	5.3	5.7	6.1	6.6	7.0

SLP15 Double Slider

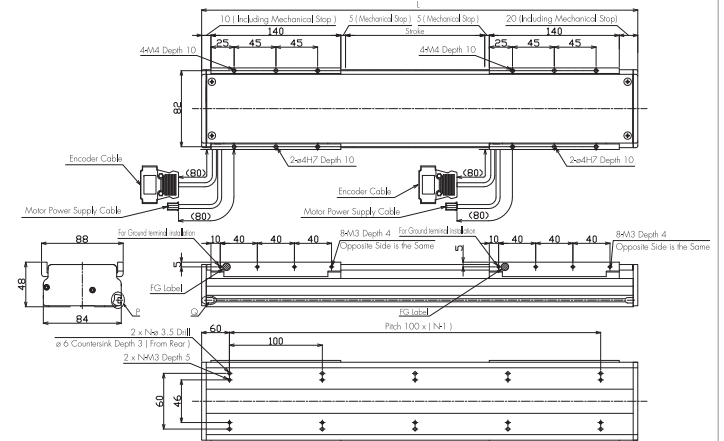
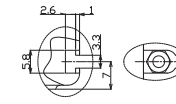
Motor Power Supply Cable Specifications

Fitachi Cable : UI2464
AWG 25
Outer dimension ϕ 4.3
JST XM Connector (Male)

Encoder Cable Specifications

Heidenhain
Outer dimension ϕ 4.3
Omron Dsub 15-pin Connector (Male)

P,Q Section Detail



Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200
L (mm)	420	520	620	720	820	920	1020	1120	1220	1320	1420	1520
N	4	5	6	7	8	9	10	11	12	13	14	15
Weight (kg)	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.1	6.5	6.9	7.4	7.8

Advantages

- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- No-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free

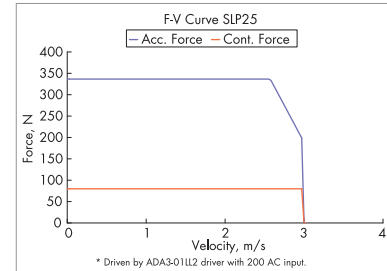


Performance

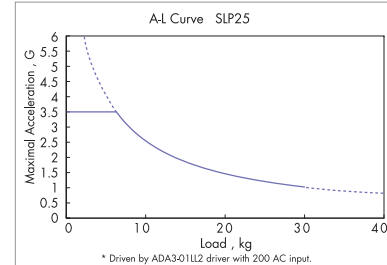
SLP25

Rated Spec	Unit	Specification	
Encoder	mm	0.001 [HEIDENHAIN IIDA279]	
Continuous Force	N	80	
Peak Force	*1 N	340	
Continuous Current	*2 A	1.2	
Peak Current	*1 A	5.1	
Force Constant	N/A	66	
Back EMF	V/m/s	22	
Resistance	*3 ohm	22	
Inductance	*3 mH	31	
Magnetic Pitch (N-N)	mm	90	
Maximum Acceleration	*4 G	3.5	
Maximum Velocity	*4, *5 m/s	3	
Repeatability	mm	±0.0005	
Max load	Horizontal	kg	30
	Wall		15
Stroke	Single Forcer	mm	200~1200 [100 interval]
	*6 Double Forcer		200~1000 [100 interval]
Operating Temperature	°C	0~40	
Operating Humidity	%	20~80 [no condensation]	
Storage Temperature	°C	-20~60	

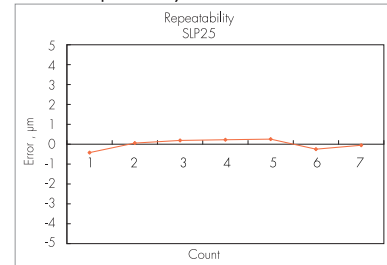
F-V Curve



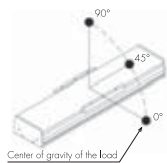
Maximum Acceleration vs. Load



Position Repeatability



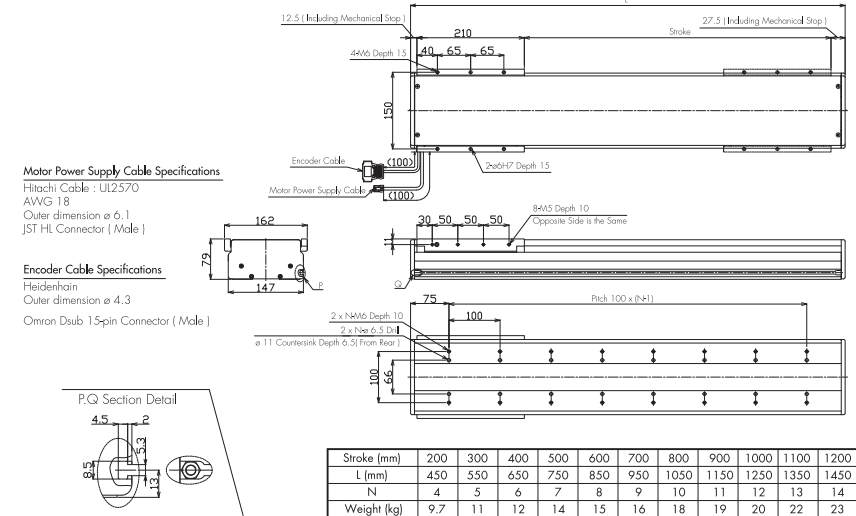
Overhanging Weight Tolerance



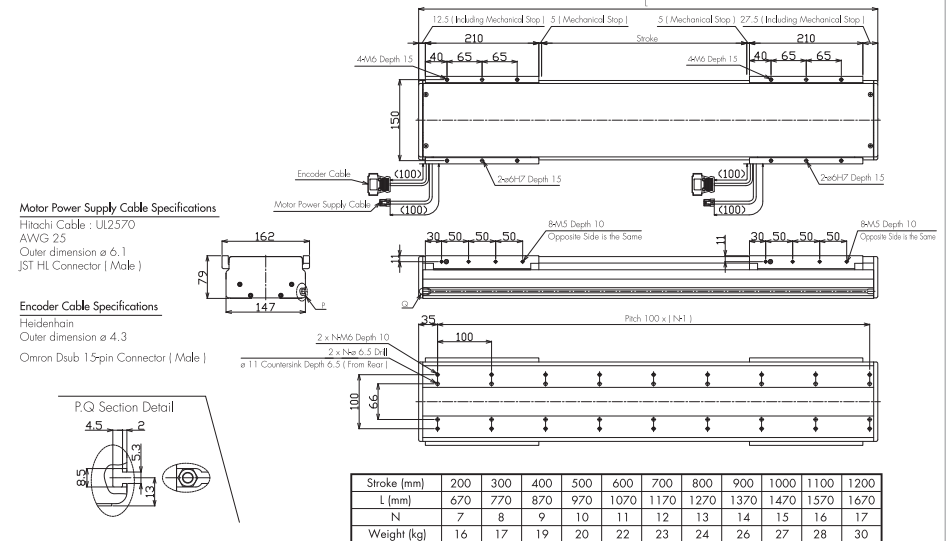
Load	Horizontal		
	0°	45°	90°
5kg	1000	1000	1000
10kg	1000	800	1000
15kg	800	650	1000
20kg	700	580	1000
25kg	550	500	1000
30kg	500	450	1000
Wall	3kg	1000	1000
	6kg	1000	800
	9kg	1000	670
	12kg	1000	580
	15kg	1000	500

Unit : mm

SLP25 Single Slider

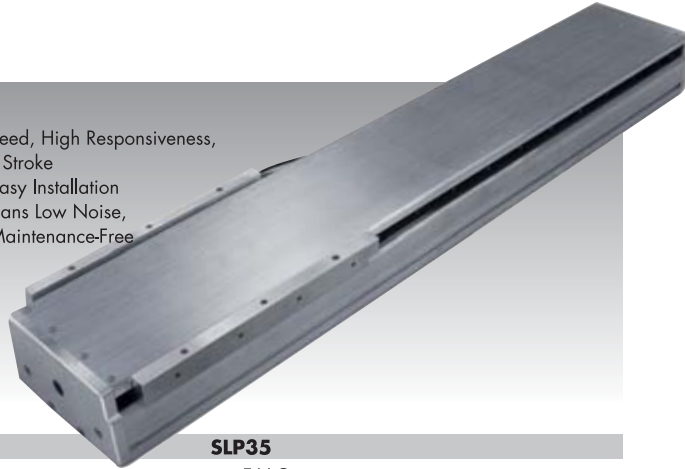


SLP25 Double Slider



Advantages

- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- No-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free

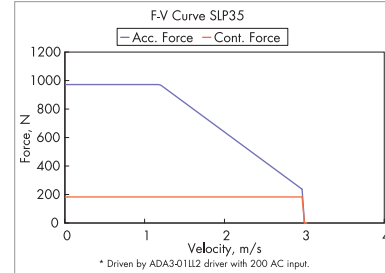


Performance

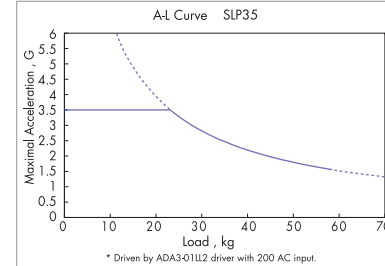
SLP35

Rated Spec	Unit	Specification	
Encoder	mm	0.001 (HEIDENHAIN IIDA279)	
Continuous Force	N	18.5	
Peak Force	*1 N	970	
Continuous Current	*2 A	2.7	
Peak Current	*1 A	14.4	
Force Constant	N/A	68	
Back EMF	V/m/s	22	
Resistance	*3 ohm	7.2	
Inductance	*3 mH	12	
Magnetic Pitch (N-N)	mm	120	
Maximum Acceleration	*4 G	3.5	
Maximum Velocity	*5 m/s	3	
Repeatability	mm	±0.0005	
Max load	Horizontal	kg	60
	Wall	kg	30
Stroke	Single Forcer	mm	300~1200 (100 interval)
	*6 Double Forcer	mm	300~900 (100 interval)
Operating Temperature	°C	0~40	
Operating Humidity	%	20~80 (no condensation)	
Storage Temperature	°C	-20~60	

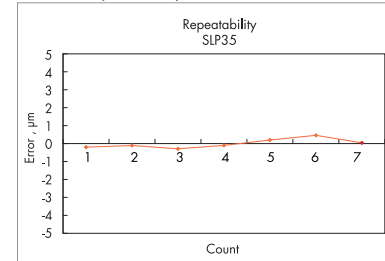
F-V Curve



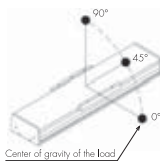
Maximum Acceleration vs. Load



Position Repeatability



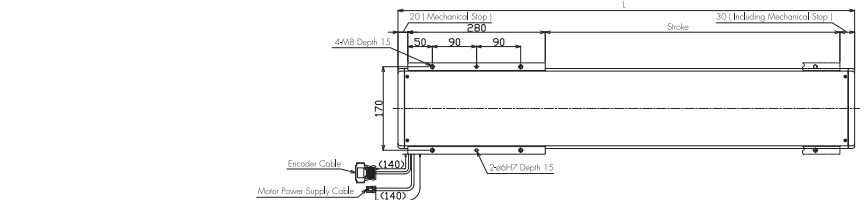
Overhanging Weight Tolerance



Load	0°			45°			90°		
	10kg	1000	1000	1000	1000	1000	1000	1000	1000
Horizontal	20kg	1000	900	900	1000	1000	1000	1000	1000
	30kg	940	780	780	1000	1000	1000	1000	1000
	40kg	840	660	660	1000	1000	1000	1000	1000
Wall	50kg	750	590	590	950	950	950	950	950
	60kg	680	540	540	900	900	900	900	900
	5kg	1000	1000	700	700	700	700	700	700
	10kg	1000	900	600	600	600	600	600	600
	15kg	1000	810	520	520	520	520	520	520
	20kg	1000	710	430	430	430	430	430	430
25kg	980	620	350	350	350	350	350	350	
30kg	890	530	300	300	300	300	300	300	

Unit : mm

SLP35 Single Slider

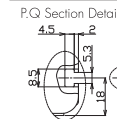


Motor Power Supply Cable Specifications

Hitachi Cable : UI2570
AWG 18
Outer dimension ø 6.1
JST HL Connector (Male)

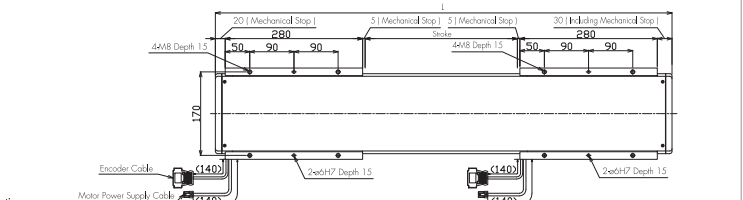
Encoder Cable Specifications

Heidenhain
Outer dimension ø 4.3
Omron Dsub 15-pin Connector (Male)



Stroke (mm)	300	400	500	600	700	800	900	1000	1100	1200
L (mm)	630	730	830	930	1030	1130	1230	1330	1430	1530
N	6	7	8	9	10	11	12	13	14	15
Weight (kg)	17	19	21	23	25	26	28	30	32	34

SLP35 Double Slider

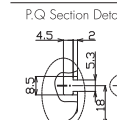


Motor Power Supply Cable Specifications

Hitachi Cable : UI2570
AWG 18
Outer dimension ø 6.1
JST HL Connector (Male)

Encoder Cable Specifications

Heidenhain
Outer dimension ø 4.3
Omron Dsub 15-pin Connector (Male)

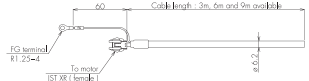


Stroke (mm)	300	400	500	600	700	800	900
L (mm)	920	1020	1120	1220	1320	1420	1520
N	9	10	11	12	13	14	15
Weight (kg)	28	30	32	33	35	37	39

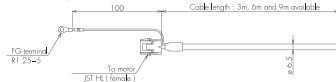
Cables

Motor power cable

•SLP15



•SLP25, SLP35



•SLP15

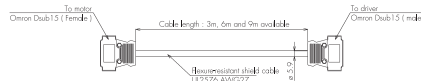
Wire color	Cable specification
UPhase Red	Hitech Cable Ltd. Robot cable UI2464
VPhase White	AWG25
WPhase Black	Junkosha Inc. Robot cable AWG18
FG Green Yellow	AWG18

•SLP25, SLP35

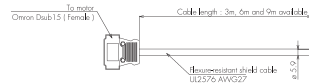
Wire color	Cable specification
UPhase Red	Hitech Cable Ltd. Robot cable UI2570
VPhase White	AWG18
WPhase Black	Junkosha Inc. Robot cable AWG18
FG Green Yellow	AWG18

Encoder cable

•Dual-side Dsub connector

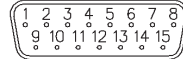


•One-side Dsub connector



•Connector Pinout (To motor and driver)

Pin No.	Signal	Wire color
1	A+	White
2	OV	Black/Red
3	B+	Green
4	SV	Red
7	Z-	Black/Yellow
9	A-	Black/White
11	B-	Black/Green
14	Z+	Yellow



* Unlisted Pin Nos are No connection.
* Shield should be moved toward the connector housing.

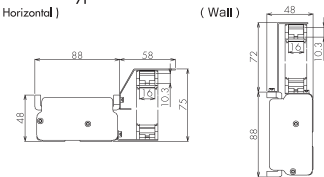
Cable Carrier

S Type : Ibus K.K. 07.16.028.0 (Common for 3 models)

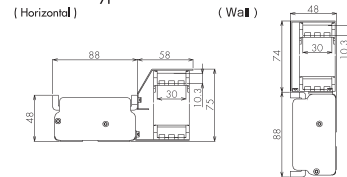
M Type : Ibus K. K. 07.30.028.0 (Common for 3 models)

Please indicate the placement, either horizontal or wall, when purchased

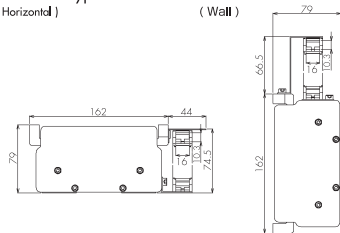
•SLP15 S Type installation dimension (Horizontal)



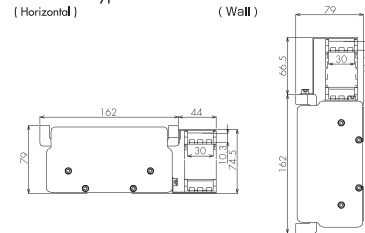
•SLP15 M Type installation dimension (Horizontal)



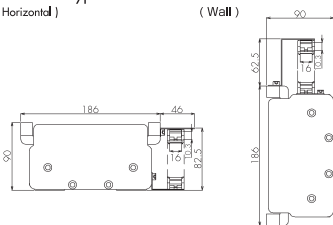
•SLP25 S Type installation dimension (Horizontal)



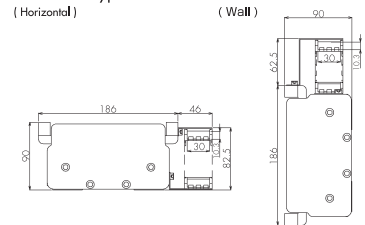
•SLP25 M Type installation dimension (Horizontal)



•SLP35 S Type installation dimension (Horizontal)



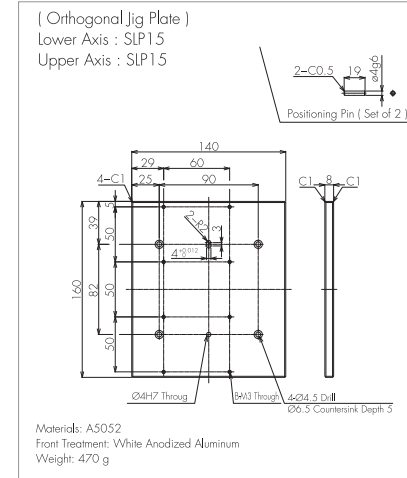
•SLP25 M Type installation dimension (Horizontal)



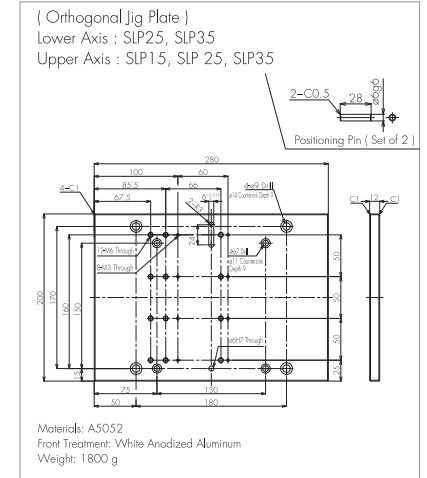
Orthogonal Jig Plate for Use With X-Y Table

When constructing a multiple-axis table utilizing several SLP Series, installation is exceptionally easy with the placement of this jig inbetween the axes. It is also possible to easily gain orthogonal precision between the lower axis and the upper axis by positioning the two attached positioning pins to the precision holes on the face of the stage's slider installation. However, because there is a limit to the possible combinations between models, please use the models suitable for multiple axes in the figures below.

•Orthogonal Jig Plate A

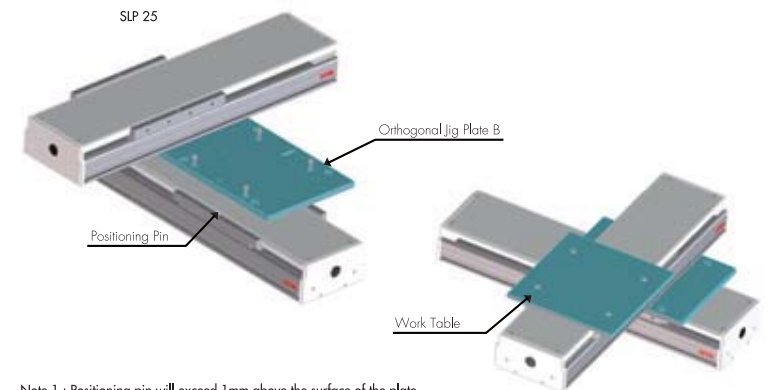


•Orthogonal Jig Plate B



Orthogonal Jig Plate Usage Directions

Orthogonal Jig Plate Assembly Example



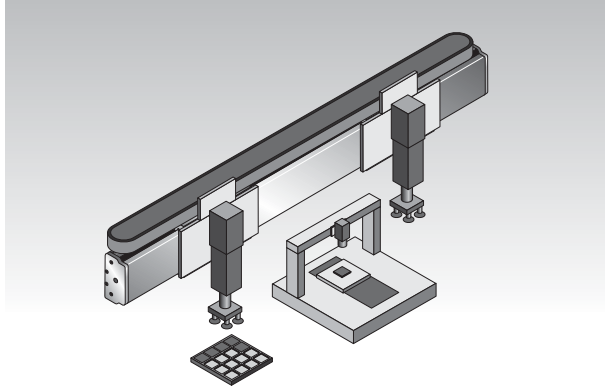
Note 1 : Positioning pin will exceed 1mm above the surface of the plate.
Please set the screws while pushing the positioning pin.
Note 2 : The work table is not included in the accessories.

X-Y Stage complete !!

Example Usage

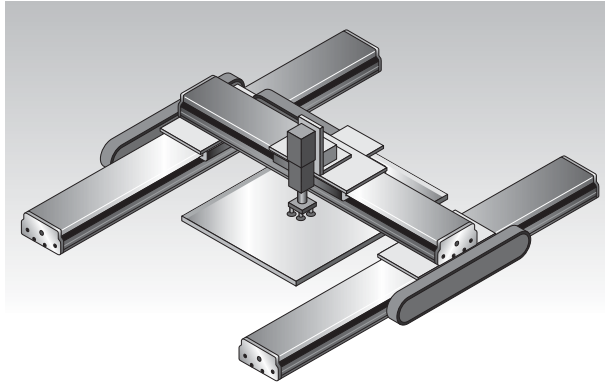
Loader/Unloader

- Multiple sliders move independently at high precision.
- Use of a multislider enhances costcutting and saves space.



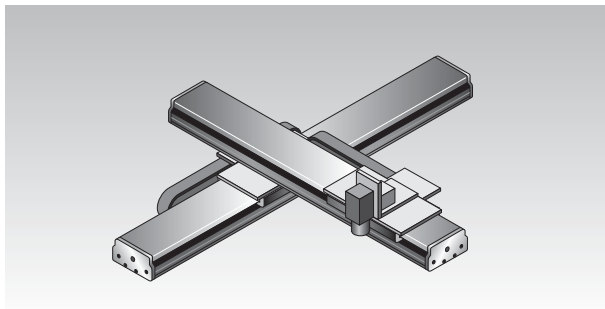
Substrate Conveyance Device

- By placing the lower shafts in a parallel position it is possible to place work in the central space.

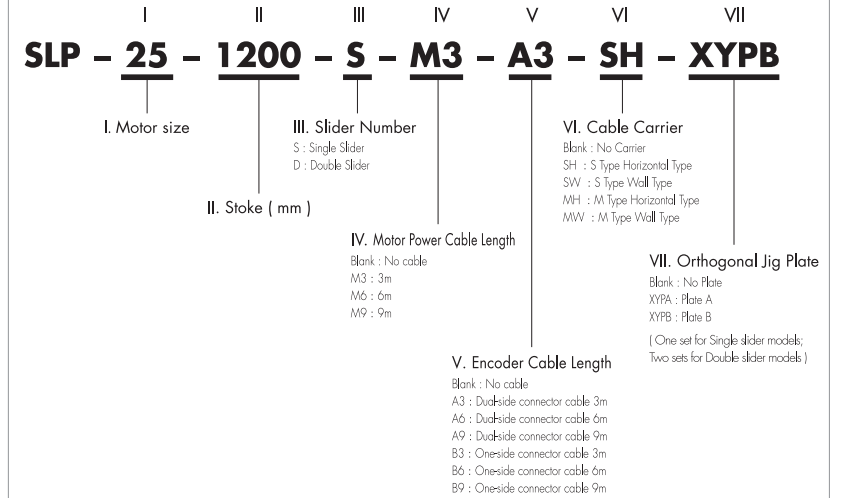


Substrate Conveyance Device

- Due to the many number of ways in which the SLP15, SLP25 and SLP35 can be used together, high speed and a wide range of movement are possible.



SLP Model Codes (Example : SLP25)



NIPPON PULSE MOTOR NSD

Features

- Drive Shaft motor with / without pole sensor with automatic detection
- Up to 2.5Mpps of pulse input at position control
- Internal program mode
- Optional serial communication(Motionnet) function
- Position, velocity, current control
- CE certified

Model No.	Input Voltage [V]	Rated Current [A (rms)]	Maximum Current [A (rms)]
NSD-A2	AC85~126.5	1.8	5.4



PANASONIC MINAS A4L series

Features

- Drive Shaft motor with/without pole sensor with automatic detection
- Up to 4Mpps of pulse input at position control / Velocity response of 1kHz A/B/Z phase feedback pulse input
- Position, velocity, current, vibration control
- CE UL certified

Model No.	Input Voltage [V]	Rated Current [A (rms)]	Maximum Current [A (rms)]
MADDT1105L16	1-Phase AC100~115	1.15	3.45
MADDT1107L16		1.7	5.1
MBDDT2110L16		2.5	7.5
MCDDT3120L16	1-Phase AC200~240	4.6	13.8
MADDT1205L16		1.15	3.45
MADDT1207L16		1.63	4.89
MBDDT2210L16	1-Phase / 3-Phase AC200~240	2.6	7.8
MCDDT3520L16		4.0	12
MDDDT3530L16		5.6	16.8
MDDDT5540L16	3-Phase AC200~230	9.5	28.5
MEDDT7364L16		13.4	40.2
MFDDTA390L16		18.6	55.8
MFDDTB3A2L16	3-Phase AC200~230	33.0	99.0
MGDDTC3B4L16		47.0	141



Elmo (Israel)

Features

- Capable of driving all Shaft motors
- Small package / adapt to wide range of electric supply (AC / DC)
- Position, velocity, current control
- CE UL certified

Model Name	Input Voltage [V]	Rated Current [A (rms)]	Maximum Current [A (rms)]
Whistle	DC6~95	0.7~14.1	Rated Current x 2
Guitar	DC11~195	2.12~25.0	
Drum	DC11~395	12.7~50.0	
Harmonica	DC10~195	0.9~9.4	
Bassoon	AC30~270	0.7~4.2	
Cornet	AC60~505	1.0~6.4	
Tuba	AC60~505	8.5~14.1	



**PCI-104 4-axis controller board
NPMC6045A-4104**

- Controller for stepping motors and AC servo motors
- Pulse output 6.5Mpps maximum
- Interpolation functions (2-axis circular, 4-axis linear interpolation) / Continuous positioning control
- Position and velocity change during an operation
- Easy application development using attached Utility Software
- Device driver for Window and DLL for VC++ and Visual Basic are included



**PCI 4-axis controller board
PPCI7443**

NPMC6045A-4104 Accessories (cable, terminal board) Optional

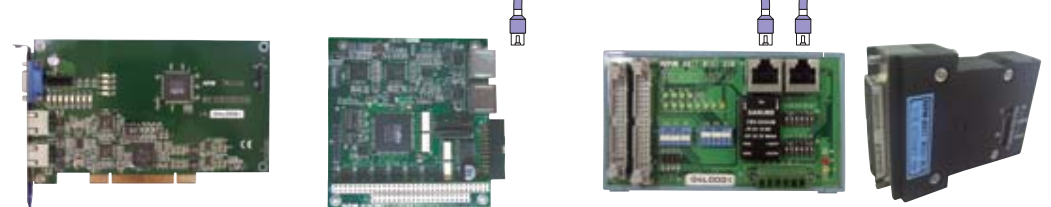
CN1 cable 50-pin NPMC-C50J2	1.2m	No.1/No.2 axis motor drivers, Mechanical inputs
CN2 cable 50-pin NPMC-C50J2	1.2m	No.3/No.4 axis motor drivers, Mechanical inputs
PCN-1H-50	—	50 pin Connecton Terminal board

PPCI7443 Accessories (cables, terminal board) Optional

CN1 cable 2-pin	0.3m	Power supply input
CN2 cable 100-pin	2m	* Motor driver, other input/output signal
DIN-100S-2M	1pc	100-pin Terminal board
CN3 cable 12-pin	2m	Manual Pulser input
CN4 cable 6-pin	2m	Multiple board simultaneous start/stop
CN5 cable 10-pin	2m	General purpose output



High speed serial communication system Motionnet®



**PCI bus Center Board
PPCI-L112**

**PC-104 bus Center Board
NPMCMNET-I/O104**

**Motion Control Board
MNET-M101-DUM**

**MINAS A4 Exclusive
MNET-M321-MIA**

- Motionnet Center Board (-line connection)
- Communication Speed: 20 Mbps maximum
- Maximum 128 local devices controllable
- Communication distance: 100m maximum
- Parallel I/O available (IN 8 / OUT 4)
- Device driver for Window included
- DLL DOS sample program for VC++, VB included

- Motionnet Local Board
- Controller for Stepping motors, AC Servo motors
- Pulse output 6.5Mpps Maximum

MNET-M101-DUM: General-purpose Motion Board
MNET-M321-MIA: Panasonic MINAS A4 series
(Directly connect to the IN/OUT connector of the driver
No wiring necessary)