

N I P P O N P U L S E . C O M



Linear Stage Systems

NPM

Nippon Pulse
Your Partner in Motion Control

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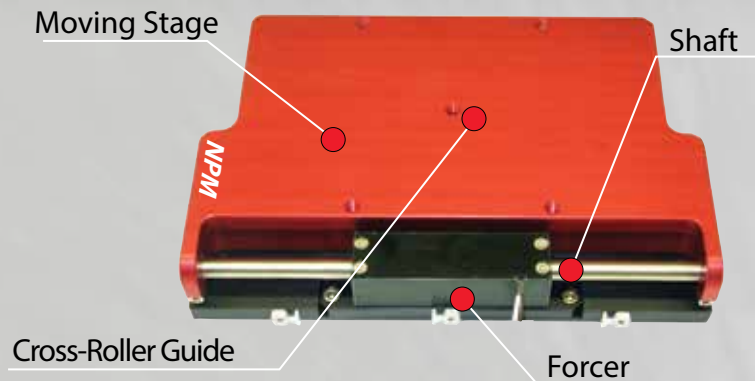
SCR

NANOPOSITIONING SERIES

High Precision Single-Axis Linear Stage

The SCR Nanopositioning Series offers the accuracy of piezo driven stages with the speed and performance of servo stages. SCR series stages produce extremely accurate results with no loss in stability, regardless of the complexity of the motion profile. As in all Linear Shaft Motor applications, a non-critical air gap allows for a system that does not have any variation of force generated.

The SCR stage also includes an integrated cross-roller guide. With a simple, lightweight, compact shaft-type linear motor comprised of only a magnet and a coil, large drive force is gained with an efficient and short coil length, allowing for high speed and high precision applications. Because there is no friction, there is no sound or dust, making the motor maintenance-free.



Four SCR stage models allow for design flexibility in high-precision applications:



SLP

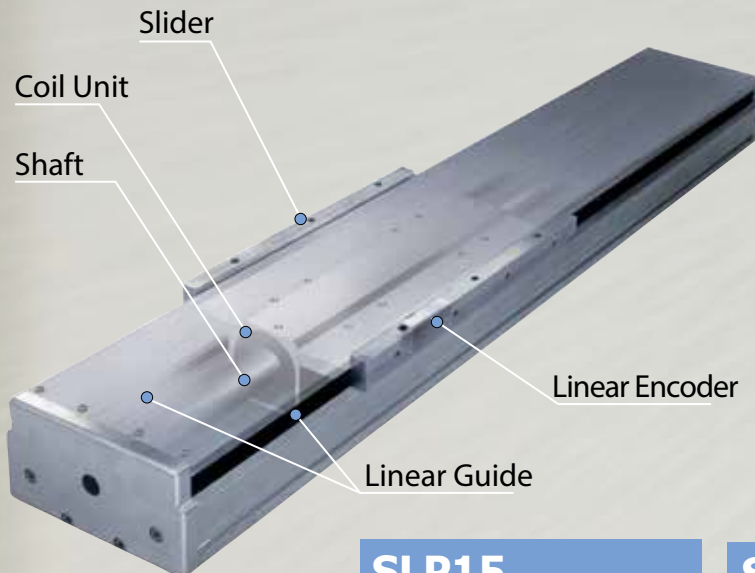
ACCULINE SERIES

High Performance Single-Axis Linear Stage

A high-precision stage for industrial applications, the SLP Acculine Series stage offers superior technology unmatched by any other linear stage system.

All-inclusive SLP series stages provide integrated shaft support within the housing, simplifying the transition from conventional linear motion systems such as ball-screws and pneumatic actuators. Because it features an integrated, lightweight, compact Linear Shaft Motor, the SLP is a low-profile, high-precision stage. The Linear Shaft Motor is designed for the ultra high-precision market (see page 19 of this booklet for more information).

The SLP series features the smallest deadzone of any stage system available on the market. In addition, no competing stage matches the SLP series' force-to-volume ratio, making it an outstanding solution for projects and applications with space limitations.

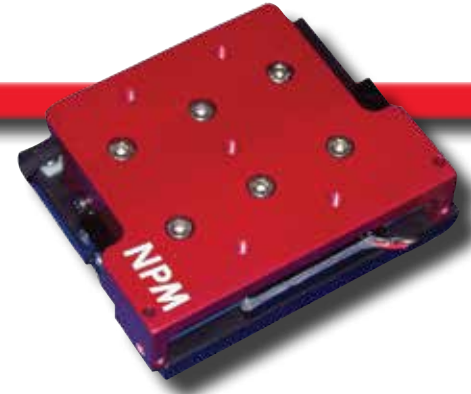


There are three SLP models to meet your high-performance needs:



SCR050

The SCR050 stage utilizes a S040 Linear Shaft Motor, making it a compact, precise solution for small-scale stage applications. The encoder and motor cables are built into the stationary base and are designed so there is no need for them to bend and flex. All SCR stages utilize a moving magnet design. With a built-in optical linear encoder that provides sub-nanometer resolution, the SCR050 is a complete compact stage solution for small-scale precision movement.



Stage Specifications

Stage Specifications	Units	SCR050-020	SCR050-040
Travel/Stroke	mm	20	40
Accuracy	µm	2	2
Encoder Resolution	nm	1000, 500, 100, 50, 10	
Bi-Directional Repeatability ¹		±1 count	
Maximum Acceleration	m/s ²	10	7
Maximum Velocity ²	m/s	0.4	0.5
Load Capacity ³	kg	10	
Moving Mass	kg	0.229	0.298
Total Mass	g	630	730
Straightness & Flatness	µm	2.5/25mm	
Index & Limit Sensor		Standard	
Limit Switch Over Travel	mm	1	
Hard Stop Over Travel	mm	2	
Bearing		Cross-roller Bearing	
Linear Shaft Motor		S040Q	

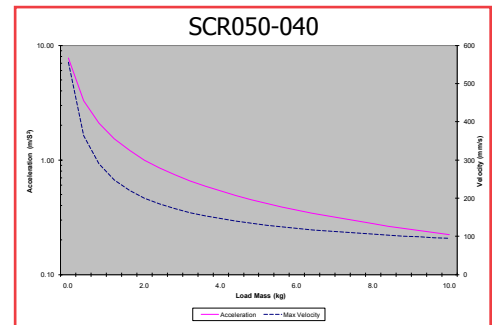
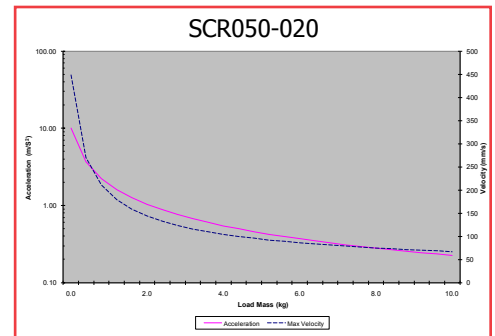
¹ Repeatability +/- 2 counts at sub 0.1 µm resolutions

² For 10nm (0.01 µm) resolution, max velocity of encoder is limited to 135mm/sec; for 50nm (0.05 µm), the limit is 675mm/sec; and for 100nm (0.1 µm), the limit is 1350mm/sec

³ Please contact our Applications Engineers for loads exceeding 10kg

Motor Cable UL1440
 AWG 28
 U-red
 V-white
 W-black
 Length: 300mm (0.3m)
 Encoder Cable Length:
 min. 1000mm

Acceleration/Velocity Curves



Dimensions

MODEL	TRAVEL mm	A
SCR050-020	20	75
SCR050-040	40	95

SCR050-020	.787 [20]	2.953 [75]
SCR050-040	1.575 [40]	3.740 [95]

Linear Shaft Motor Specifications

Motor Specifications	S040Q (Units)
Fund. Motor Constant	0.41N/√W
Motor Force Constant	2.1N/Arms
Back-EMF Constant	0.7V/m/s
Coil Resistance @ 25°C	22.4Ω
Coil Inductance	1mH
Cont. Current @ 135°C	0.3Arms
Acceleration Current	1.1Arms
Cont. Force @ 135°C	0.58N
Acceleration Force	2.3N
Cont. Power Rating	2.016W
Thermal Resistance	62.6°C/W

Your Partner In Motion Control

SCR075

The SCR075 stage is a complete single-axis stage with an integrated slide guide, encoder and Linear Shaft Motor. It offers a wide range of advantages for applications requiring high performance and accuracy. The Linear Shaft Motor allows for higher resolution, speed, and continuous force than standard stepper or piezo servomotors.

The SCR075 uses a standard S080Q Linear Shaft Motor; however, the coil windings are customizable to a double or triple winding. The SCR075 features a moving magnet design, a precision ground cross roller, and a built-in encoder.



Stage Specifications

Stage Specifications ¹	Units	SCR075-050	SCR075-100	SCR075-150
Travel/Stroke	mm	50	100	150
Stage Width (B)	mm	140	190	240
Accuracy	µm	3	5	7
Encoder Resolution	nm	1000, 500, 100, 50, 10		
Bi-Directional Repeatability ²		±1 count		
Maximum Acceleration	m/s ²	28	20	15
Maximum Velocity ³	m/s	1.1	1.4	1.5
Load Capacity ⁴	kg	45.5		
Moving Mass	kg	0.493	0.669	0.881
Total Mass	kg	1	1.3	1.7
Straightness & Flatness	µm	2.5/25mm		
Index & Limit Sensor		Standard		
Limit Switch Over Travel	mm	1		
Hard Stop Over Travel	mm	2		
Bearing		Cross-roller Bearing		
Linear Shaft Motor		S080Q		

¹ Standard stage specifications are based on the S080Q Linear Shaft Motor

² Repeatability +/- 2 counts at sub 0.1µm resolutions

³ For 10nm (0.01µm) resolution, max velocity of encoder is limited to 135mm/sec; for 50nm (0.05µm), the limit is 675mm/sec; and for 100nm (0.1µm), the limit is 1350mm/sec

⁴ Please contact our Applications Engineers for loads exceeding 45.5kg

Note: All Nippon Pulse SCR and SLP stages require a servo driver to operate the stage. Two SCR stages will bolt directly together to form a very stiff, compact X-Y assembly, without the need for adaptor plates (provided they are part of the same series). Two SCR stages can be supplied as an X-Y stage to ensure true orthogonal orientation between the two axes.

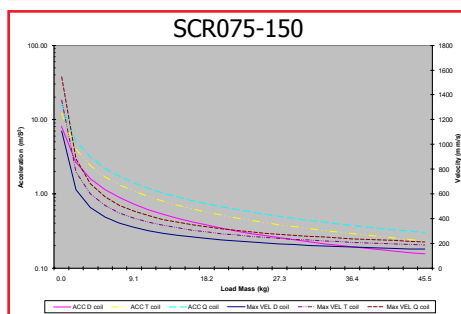
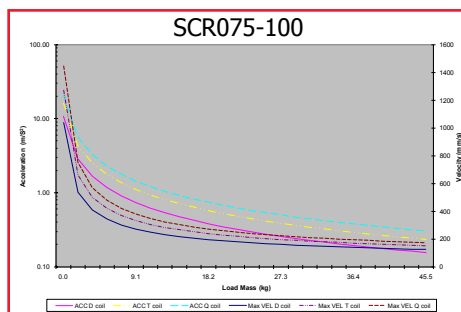
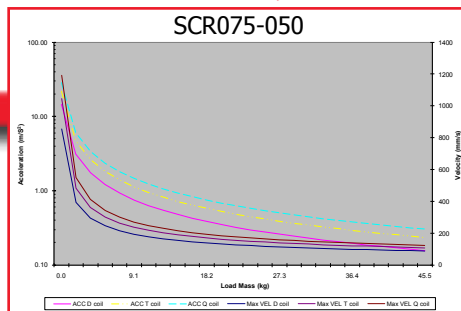
SCR075

Linear Shaft Motor Specifications

Linear Shaft Motor Force Specifications	Units	S080Q
Fundamental Motor Constant	N/W	1.46
Motor Force Constant (Kf)	N/A rms	4.2
Back-EMF Constant	V/m/s	1.4
Coil Resistance @ 25°C	Ω	9.0
Coil Inductance	mH	1.3
Continuous Current @ 135°C	A	0.8
Acceleration Current	A	3.4
Continuous Force @ 135°C	N	3.5
Acceleration Force	N	14
Continuous Power Rating	W	5.76
Thermal Resistance	°C/W	17.3

Note: Curves apply only to the stage's standard Linear Shaft Motor, the S080Q. Please contact our application engineers to learn more about using S080D or S080T coils in your stage.

Acceleration/Velocity Curves



Dimensions

Motor Cable
Lapp Unitronic 190-602803
AWG 28
U-red
V-white
W-black
Length: 3000mm
Encoder cable length: minimum 1000mm

8X Ø .165[4.20] THRU ALL MOUNTING HOLES FAR SIDE

8X Ø .165[4.20] ±.37[9.40] M5X0.8 - 6H ±.28[7] TOOLING HOLES

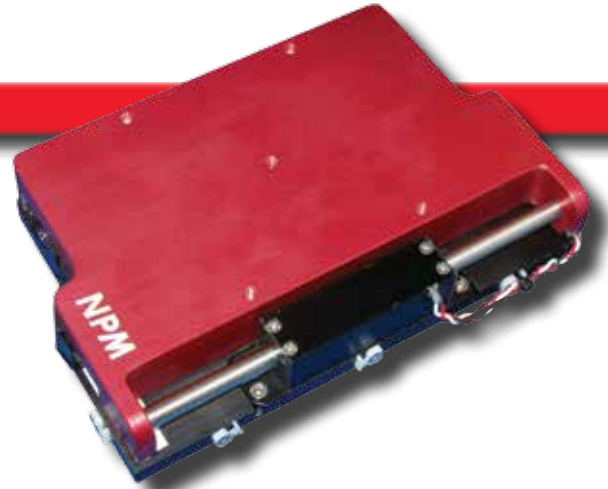
Ø .165[4.20] ±.24[6] M5X0.8 - 6H ±.18[4.50]

All units are listed in mm

MODEL	TRAVEL mm	A	B	C
SCR075-050	50	N/A	140	N/A
SCR075-100	100	115	190	115
SCR075-150	150	165	240	165

SCR100

Like its relatives, the SCR100 integrates a slide guide, encoder and a Linear Shaft Motor. A wide range of options allows for a better match for stage applications that require sub-nanometer resolution that is free from motion errors. Like the SCR050 and SCR075, the encoder and motor cables are built into the stationary base and are designed so there is no need for them to bend and flex.



Stage Specifications

Specifications ¹	Units	SCR100-050	SCR100-100	SCR100-150	SCR100-200	SCR100-250	SCR100-300
Travel/Stroke	mm	50	100	150	200	250	300
Stage Width (B)	mm	140	190	240	290	340	390
Accuracy	µm	3	5	7	9	11	12
Encoder Resolution	nm	1000, 500, 100, 50, 10					
Bi-Directional Repeatability ²		±1 count					
Maximum Acceleration	m/s ²	17	12	10	8	7	6
Maximum Velocity ³	m/s	0.9	1	1.2	1.2	1.3	1.3
Load Capacity ⁴	kg	45.5					
Moving Mass	kg	0.8	1.1	1.3	1.6	2.0	2.2
Total Mass	kg	1.6	2.1	2.6	3.2	3.9	4.5
Straightness & Flatness	µm	2/25mm					
Index & Limit Sensor		Standard					
Limit Switch Over Travel	mm	1					
Hard Stop Over Travel	mm	2					
Bearing		Cross-roller bearing					
Linear Shaft Motor		S080Q					

¹ Standard stage specifications are based on the S080Q Linear Shaft Motor

² Repeatability +/- 2 counts at sub 0.1µm resolutions

³ For 10nm (0.01µm) resolution, max velocity of encoder is limited to 135mm/sec; for 50nm (0.05µm), the limit is 675mm/sec; and for 100nm (0.1µm), the limit is 1350mm/sec

⁴ Please contact our applications engineers for loads exceeding 45.5kg

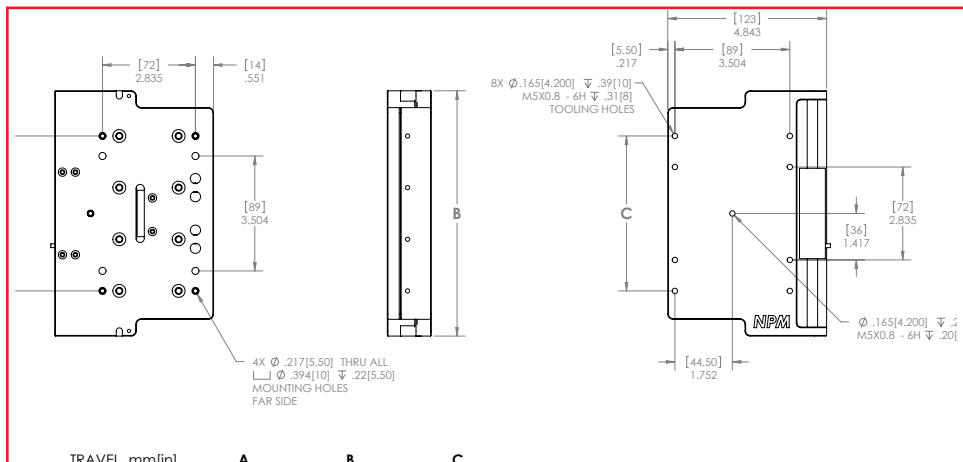
SCR100

Linear Shaft Motor Specifications

Linear Shaft Motor Force Specifications	Units	S080Q
Fundamental Motor Constant	N/W	1.39
Motor Force Constant (Kf)	N/A rms	4.2
Back-EMF Constant	V/m/s	1.4
Coil Resistance @ 25°C	Ω	9
Coil Inductance	mH	1.3
Continuous Current @ 135°C	A	0.84
Acceleration Current	A	3.4
Continuous Force @ 135°C	N	3.5
Acceleration Force	N	14
Continuous Power Rating	W	12.7
Thermal Resistance	°C/W	17.3

Note: Curves apply only to the stage's standard motor, the S080Q. Please contact our application engineers to learn more about using S080D or S080T coils in your stage.

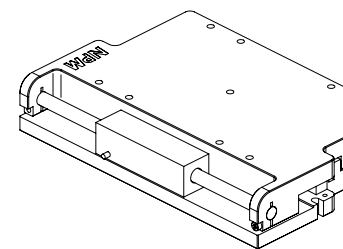
Dimensions



Motor Cable

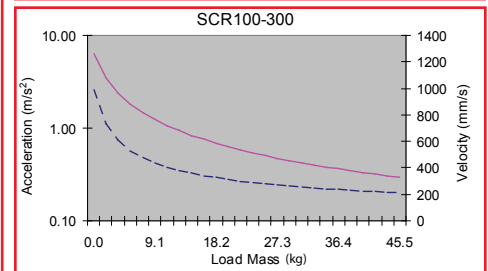
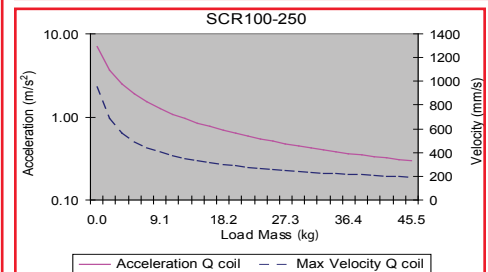
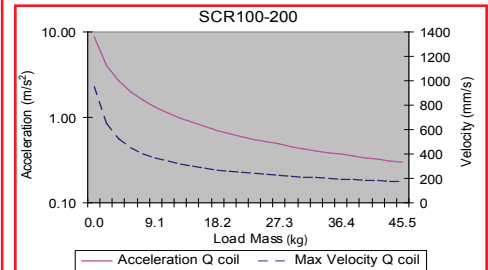
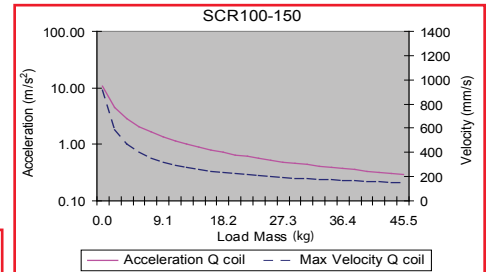
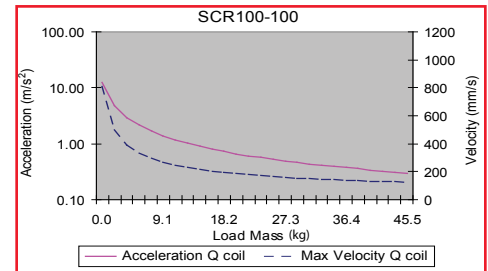
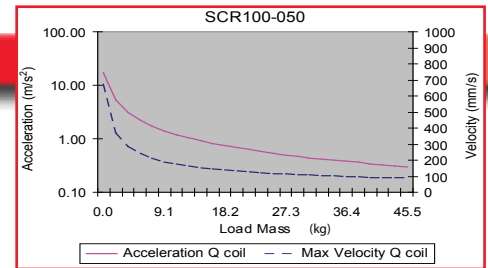
Lapp Unitronic 190-602803
 AWG 28
 U-red
 V-white
 W-black
 Length: 3000mm
 Encoder cable length:
 minimum 1000mm

MODEL	TRAVEL mm	A	B	C
SCR100-050	50	N/A	140	N/A
SCR100-100	100	120	190	120
SCR100-150	150	160	240	160
SCR100-200	200	200	290	200
SCR100-250	250	260	340	260
SCR100-300	300	300	390	300



All units are listed in mm

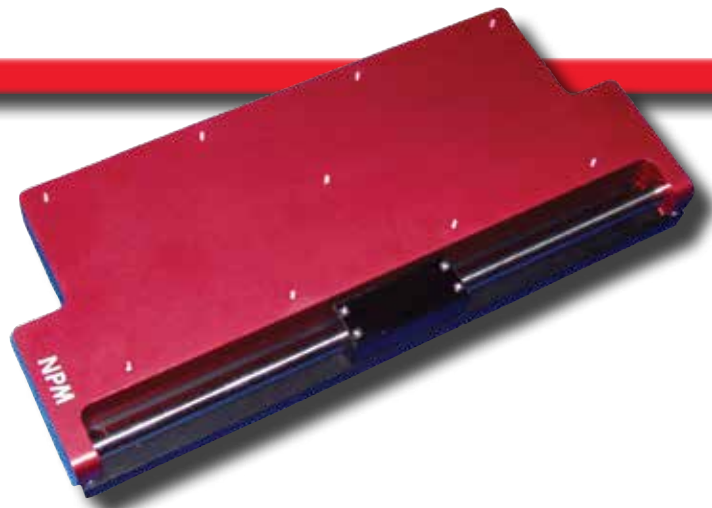
Acceleration/Velocity Curves



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SCR150

The largest of the SCR stages, the SCR150 stage has stroke lengths up to 300mm while maintaining the high performance and accuracy of the smaller SCR stages. Like the other three stages, the SCR150 is a complete single-axis stage with an integrated slide guide, encoder and a Linear Shaft Motor. It offers a wide range of advantages for applications requiring high performance and accuracy.



Stage Specifications

Specifications ¹	Units	SCR150-100	SCR150-150	SCR150-200	SCR150-250	SCR150-300
Travel/Stroke ²	mm	100	150	200	250	300
Stage Width (B)	mm	230	280	330	380	430
Stroke	mm	100	150	200	250	300
Accuracy	µm	5	7	9	11	12
Encoder Resolution	nm	1000, 500, 100, 50, 10				
Bi-Directional Repeatability ³		±1 count				
Maximum Acceleration	m/s ²	17	13	11	9	8
Maximum Velocity ⁴	m/s	1.3	1.3	1.4	1.5	1.5
Load Capacity ⁵	kg	45.5				
Moving Mass	kg	2.3	2.9	3.5	4.1	4.7
Total Mass	kg	5.2	6.5	7.9	9.2	10.6
Straightness & Flatness	µm	2/25mm				
Home & Limit Sensor		Standard				
Limit Switch Over Travel	mm	1				
Hard Stop Over Travel	mm	2				
Bearing		Cross-roller bearing				
Linear Shaft Motor		S160D				

¹ Standard stage specifications based on the S160D Linear Shaft Motor

² Travel/Stroke with S160D coil; when using S160T, stroke is 30mm shorter; when using S160Q, stroke is 60mm shorter

³ Repeatability +/- 2 counts sub 0.1µm resolutions

⁴ For 10nm (0.01µm) resolution, max velocity of encoder is limited to 135mm/sec; for 50nm (0.05µm), the limit is 675mm/sec; for 100nm (0.1µm), the limit is 1350mm/sec

⁵ Please contact our applications engineers for loads exceeding 45.5kg

SCR150

Linear Shaft Motor Specifications

Linear Shaft Motor Force Specifications	Units	S160D
Fundamental Motor Constant	N/W	3.51
Motor Force Constant (Kf)	N/A rms	16
Back-EMF Constant	V/m/s	5.4
Coil Resistance @ 25°C	Ω	21
Coil Inductance	mH	8.2
Continuous Current @ 135°C	A	0.6
Acceleration Current	A	2.5
Continuous Force @ 135°C	N	10
Acceleration Force	N	40
Continuous Power Rating	W	16.1
Thermal Resistance	°C/W	33.2

Note: Curves apply only to the stage's standard motor, the S160D Linear Shaft Motor. Please contact our application engineers to learn more about using S160T or S160Q coils in your stage.

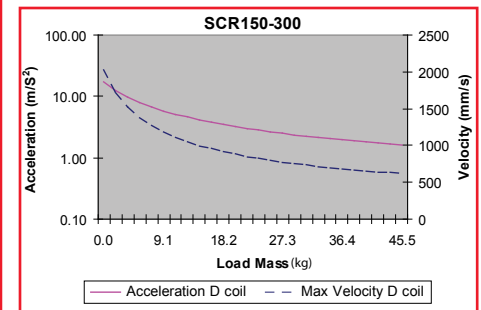
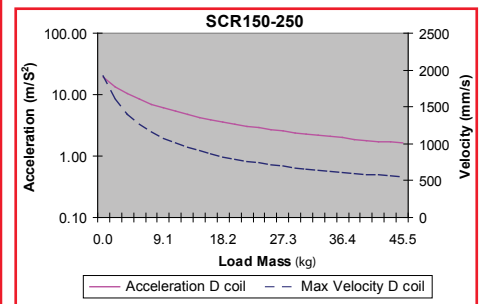
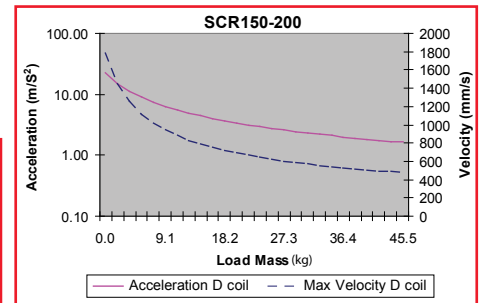
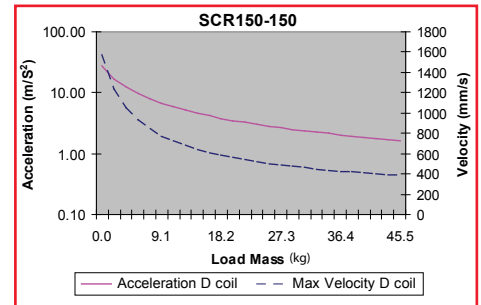
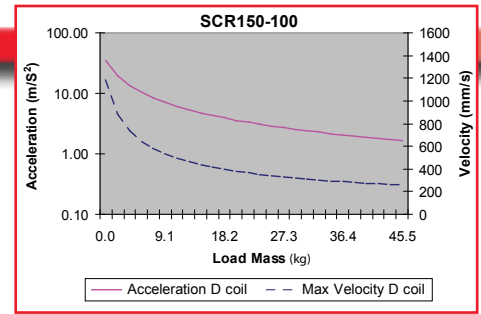
Dimensions

Motor Cable
 UL2464
 AWG 24
 U-orange
 V-white
 W-gray
 Length: 300mm
 Encoder cable length:
 minimum 1000mm

MODEL	TRAVEL mm	A	B	C
SCR150-100	100	N/A	230	N/A
SCR150-150	150	175	280	175
SCR150-200	200	225	330	225
SCR150-250	250	275	380	275
SCR150-300	300	325	430	325

All units are listed in mm

Acceleration/Velocity Curves



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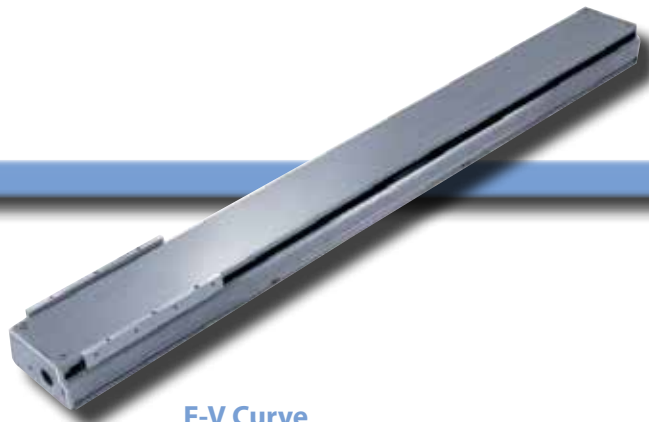
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SLP15



- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- Non-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free

Stage Specifications

Rated Spec	Unit	Specification
Encoder Resolution	μm	1 (HEIDENHAIN LIDA279)
Continuous Force	N	17
Acceleration Force ¹	N	90
Continuous Current ²	A	0.51
Acceleration Current ¹	A	2.7
Force Constant (Kf)	N/A rms	33
Back-EMF Constant	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	3.0
Bi-Directional Repeat-ability	mm	±0.0005
Max Load, Horizontal	kg	5.0
Load Capacity	kg	3.0
Stroke, Single Forcer ⁶	mm	100~2000 (100 interval)
Stroke, Double Forcer ⁶	mm	100~1800 (100 interval)
Operating Temperature	°C	0~+40
Operating Humidity	%	20~80 (no condensation)
Storage Temperature	°C	-20~+60
Moving Mass	kg	0.5

¹ Acceleration Force given is based on the output with the use of the SLP15 driver ([I14] Hitachi Production Machine System ADA3-01LL2)

² The effective amperage when the temperature increase of the coil front becomes 110K

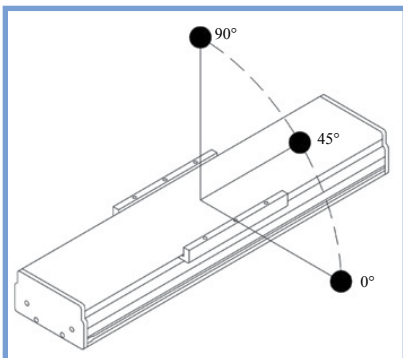
³ An average value of U-V, U-W, and V-W

⁴ There are instances when this is not achieved due to load or operation specifications

⁵ There are instances when this is not achieved due to the length of the stroke

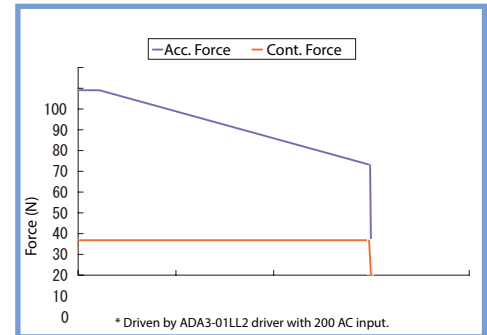
⁶ Contact Nippon Pulse for longer stroke lengths

Overhanging Weight Tolerance (in mm)

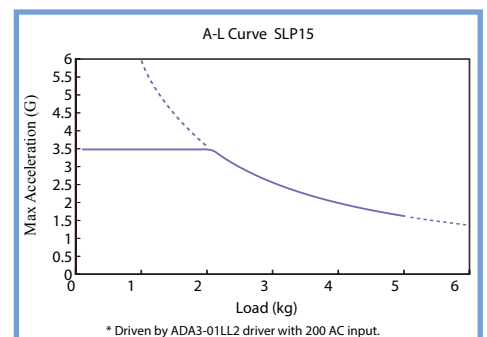


	Load	0°	45°	90°
Horizontal	1kg	380	400	450
	2kg	220	250	270
	3kg	160	190	200
	4kg	120	140	150
	5kg	100	110	130
Wall	1kg	440	390	320
	2kg	260	230	180
	3kg	180	170	120

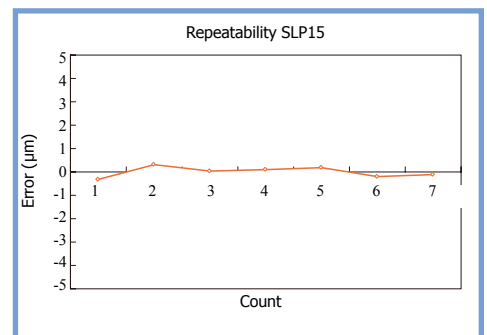
F-V Curve



Max. Acceleration vs. Load



Position Repeatability



SLP15

Single Slider Dimensions

Motor Cable Specifications
 Hitachi Cable
 UL2464
 AWG 25
 U-red; V-white; W-black
 Outer Diameter ø 4.3mm
 JST XM Connector (Male)

Encoder Cable Specifications
 Heidenhain
 Outer Diameter ø 4.3 mm
 Dsub 15 Pin Connector (Male)

N = sets of holes on stage
 Available stroke 100mm-2000mm

All units are listed in mm

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

Double Slider Dimensions

Motor Cable Specifications
 Hitachi Cable
 UL2464
 AWG 25
 U-red; V-white; W-black
 Outer Diameter ø 4.3mm
 JST XM Connector (Male)

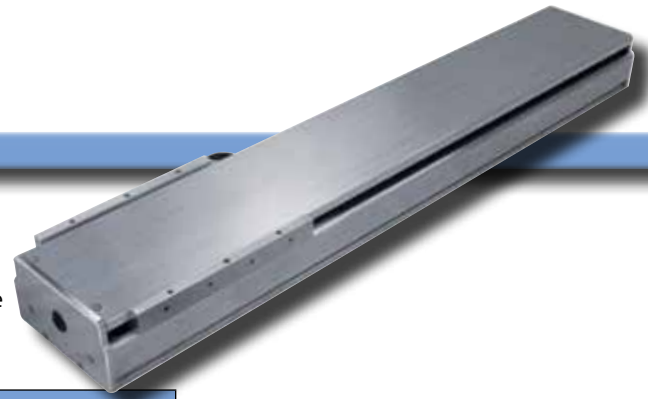
Encoder Cable Specifications
 Heidenhain
 Outer Diameter ø 4.3 mm
 Dsub 15 Pin Connector (Male)

N = sets of holes on stage
 Available stroke 100mm-1800mm

All units are listed in mm

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

SLP25



- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- Non-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free

Stage Specifications

Rated Spec	Unit	Specification
Encoder Resolution	μm	1 (HEIDENHAIN LIDA279)
Continuous Force	N	80
Acceleration Force ¹	N	340
Continuous Current ²	A	1.2
Acceleration Current ¹	A	5.1
Force Constant (Kf)	N/A rms	66
Back-EMF Constant	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	3.0
Bi-Directional Repeat-ability	mm	±0.0005
Max Load, Horizontal	kg	30
Load Capacity	kg	15
Stroke, Single Forcer ⁶	mm	200-2000 (100 interval)
Stroke, Double Forcer ⁶	mm	200-1800 (100 interval)
Operating Temperature	°C	0~+40
Operating Humidity	%	20~80 (no condensation)
Storage Temperature	°C	-20~+60
Moving Mass	kg	2.7

¹ Acceleration Force given is based on the output with the use of the SLP25 driver ([14] Hitachi Production Machine System ADA3-01LL2)

² The effective amperage when the temperature increase of the coil front becomes 110K

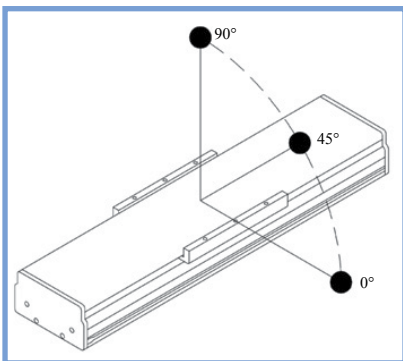
³ An average value of U-V, U-W, and V-W

⁴ There are instances when this is not achieved due to load or operation specifications

⁵ There are instances when this is not achieved due to the length of the stroke

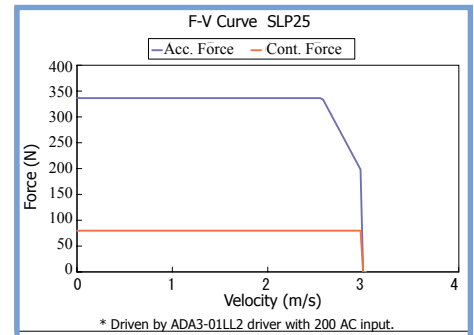
⁶ Contact Nippon Pulse for longer stroke lengths

Overhanging Weight Tolerance (in mm)

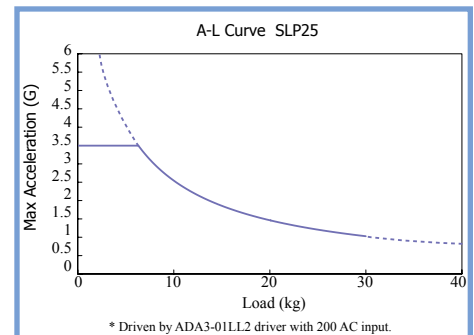


	Load	0°	45°	90°
Horizontal	5kg	1000	1000	1000
	10kg	1000	800	1000
	15kg	800	650	1000
	20kg	700	580	1000
	25kg	550	500	1000
	30kg	500	450	1000
Wall	3kg	1000	1000	580
	6kg	1000	800	450
	9kg	1000	670	400
	12kg	1000	580	350
	15kg	1000	500	300

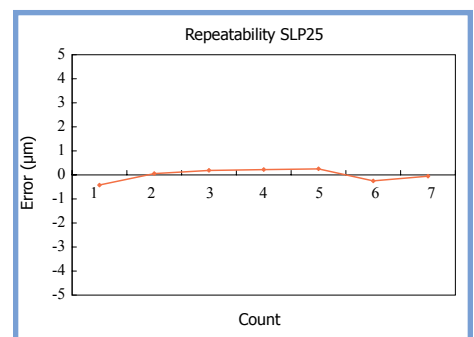
F-V Curve



Max. Acceleration vs. Load



Position Repeatability



SLP25

Single Slider Dimensions

Technical drawing of SLP25 Single Slider showing top, side, and detail views with dimensions and specifications.

Stroke (mm) | **L (mm)** | **N** | **Weight (Kg)**

200	450	5	9.7
300	550	5	11
400	650	6	12
500	750	7	14
600	850	8	15
700	950	9	16
800	1050	10	18
900	1150	11	19
1000	1250	12	20
1100	1350	13	22
1200	1450	14	23

N = sets of holes on stage
Available stroke 100mm-2000mm

Motor Cable Specifications
Hitachi Cable
UL2570
AWG 18
U-red; V-white; W-black
Outer Diameter ø 6.1
JST HL Connector (male)

Encoder Cable Specifications
Heidenhain
Outer Diameter ø 4.3
Dsub 15 Pin Connector (Male)

All units are listed in mm

Double Slider Dimensions

Technical drawing of SLP25 Double Slider showing top, side, and detail views with dimensions and specifications.

Stroke (mm) | **L (mm)** | **N** | **Weight (Kg)**

200	670	7	16
300	770	8	17
400	870	9	19
500	970	10	20
600	1070	11	22
700	1170	12	23
800	1270	13	24
900	1370	14	26
1000	1470	15	27

N = sets of holes on stage
Available stroke 100mm-1800mm

Motor Cable Specifications
Hitachi: Power Supply Co.
UL2570
AWG 18
U-red; V-white; W-black
Outer Diameter ø 6.1
JST HL Connector (male)

Encoder Cable Specifications
Heidenhain
Outer Diameter ø 4.3
Dsub 15 Pin Connector (Male)

All units are listed in mm

SLP35

- High Thrust, High Speed, High Responsiveness, High Precision, Long Stroke
- Simple Design and Easy Installation
- Non-Contact Drive means Low Noise, Long Lifespan, and Maintenance-Free



Stage Specifications

Rated Spec	Unit	Specification
Encoder Resolution	μm	1 (HEIDENHAIN LIDA279)
Continuous Force	N	185
Acceleration Force ¹	N	970
Continuous Current ²	A	2.7
Acceleration Current ¹	A	14.4
Force Constant (Kf)	N/A rms	68
Back-EMF Constant	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 ^{4,5}	m/s	3.0
Bi-Directional Repeatability	mm	±0.0005
Max Load, Horizontal	kg	60
Load Capacity	kg	30
Stroke, Single Forcer ⁶	mm	300-2000 (100 interval)
Stroke, Double Forcer ⁶	mm	300-1700 (100 interval)
Operating Temperature	°C	0~+40
Operating Humidity	%	20~80 (no condensation)
Storage Temperature	°C	-20~+60
Moving Mass	kg	4.4

¹ Acceleration Force given is based on the output with the use of the SLP35 driver

([T14] Hitachi Production Machine System ADA3-01LL2)

² The effective amperage when the temperature increase of the coil front becomes 110K.

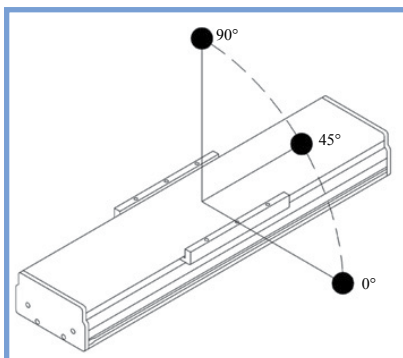
³ An average value of U-V, U-W, and V-W.

⁴ There are instances when this is not achieved due to load or operation specifications.

⁵ There are instances when this is not achieved due to the length of the stroke.

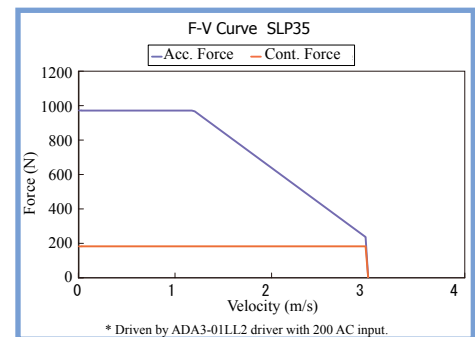
⁶ Contact Nippon Pulse for longer stroke lengths.

Overhanging Weight Tolerance (in mm)

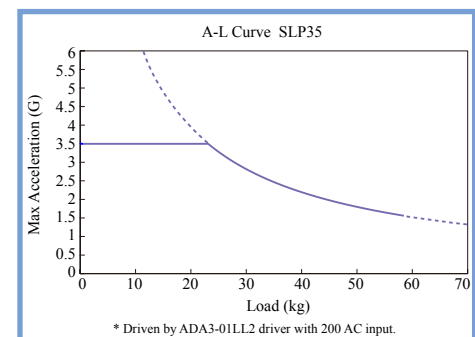


	Load	0°	45°	90°
Horizontal	10kg	1000	1000	1000
	20kg	1000	900	1000
	30kg	940	780	1000
	40kg	840	660	1000
	50kg	750	590	950
	60kg	680	540	900
Wall	5kg	1000	1000	700
	10kg	1000	900	600
	15kg	1000	810	520
	20kg	1000	710	430
	25kg	980	620	350
	30kg	890	530	300

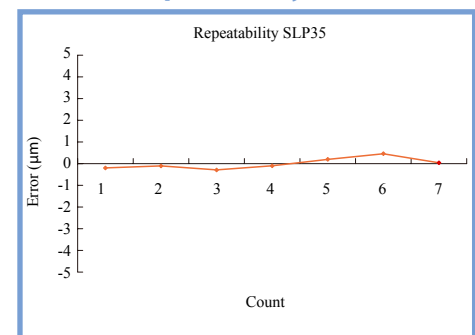
F-V Curve



Max. Acceleration vs. Load



Position Repeatability



SLP35

Single Slider Dimensions

Technical drawing of the SLP35 Single Slider. It includes a top view showing a width of 186 mm and a mounting hole spacing of 163 mm. A side view shows a height of 90 mm and a depth of 13 mm. A detailed view of the slider body shows a pitch of 100 mm x (N-1) between holes. Callouts include: 'For frame ground terminal', 'EG label', '2xN-M6 Depth 10', '2xN-ø6.5 Drill ø11 Countersink Depth 6.5 (From rear)', '20 (Including mechanical stop)', '30 (Including mechanical stop)', '2-ø6H7 Depth 15', '4-M8 Depth 15', 'Stroke', 'Encoder Cable (140)', and 'Power Supply Cable (140)'. A note states 'All units are listed in mm'.

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

N = sets of holes on stage
Available stroke 100mm-2000mm

Motor Cable Specifications
Hitachi Cable
UL2570
AWG 18
U-red; V-white; W-black
Outer Diameter ø 6.1
JST HL Connector (male)

Encoder Cable Specifications
Heidenhain
Outer Diameter ø 4.3
Dsub 15 Pin Connector (Male)

Double Slider Dimensions

Technical drawing of the SLP35 Double Slider. It includes a top view showing a width of 186 mm and a mounting hole spacing of 163 mm. A side view shows a height of 90 mm and a depth of 13 mm. A detailed view of the slider body shows a pitch of 100 mm x (N-1) between holes. Callouts include: 'For frame ground terminal', 'EG label', '4-M5 Depth 10', '2xN-M6 Depth 10', '2xN-ø6.5 Drill ø6.5 Countersink Depth 6.5 (From rear)', '20 (Including mechanical stop)', '4-M8 Depth 15', '2-ø6H7 Depth 15', '5 (mechanical stop)', '5 (mechanical stop)', '30 (Including mechanical stop)', 'Stroke', 'Encoder Cable (140)', and 'Power Supply Cable (140)'. A note states 'All units are listed in mm'.

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

N = sets of holes on stage
Available stroke 100mm-1700mm

Motor Cable Specifications
Hitachi Cable
UL2570
AWG 18
U-red; V-white; W-black
Outer Diameter ø 6.1
JST HL Connector (male)

Encoder Cable Specifications
Heidenhain
Outer Diameter ø 4.3
Dsub 15 Pin Connector (Male)

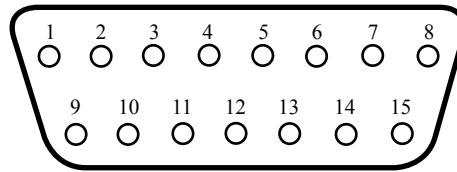
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SCR Standard Pinout

Pin	Signal	Function
2	0V	Ground
4	Z-	Reference Mark
5	B-	Incremental Signal
6	A-	Incremental Signal
7	5V	Power
8	5V	Power
9	0V	Ground
10	Q	Limit
11	P	Limit
12	Z+	Reference Mark
13	B+	Incremental Signal
14	A+	Incremental Signal
15	shield	

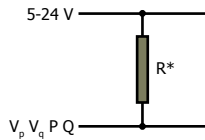


SLP Pinout

Pin	Signal	Wire Color	Function
1	A+	White	Incremental Signal
2	0V	Black/Red	Ground
3	B+	Green	Incremental Signal
4	5V	Red	Power
7	Z-	Black/Yellow	Reference Mark
9	A-	Black/White	Incremental Signal
11	B-	Black/Green	Incremental Signal
14	Z+	Yellow	Reference Mark

Note: Limits-open collector output, asynchronous pulse

Limit Outputs

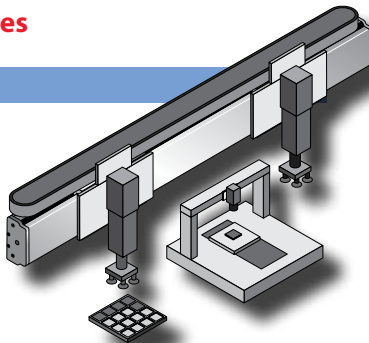


*select R for I max <20 mA
Alternatively, use a suitable relay or opto-isolator

Application Examples

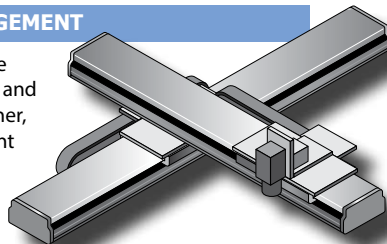
LOADER/UNLOADER

- Multiple sliders move independently with accuracy.
- Multi-sliders save space and cut costs.



STANDARD X-Y ARRANGEMENT

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



SCR X-Y ARRANGEMENT

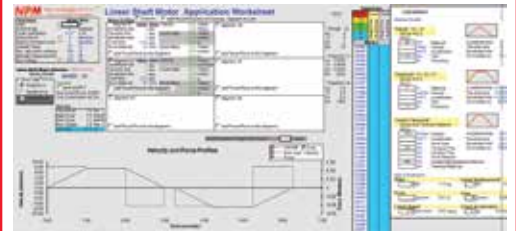
- Each SCR and SLP stage requires a servo driver to operate the stage. Any two SCR stages will bolt directly together to form a very stiff, compact X-Y assembly, without the need for adaptor plates (provided they are in the same series).



Nippon Pulse SMART

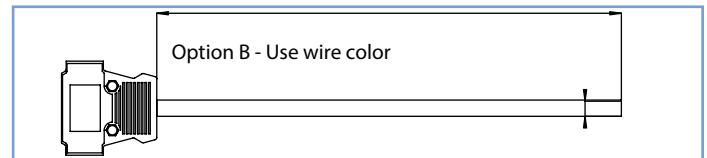
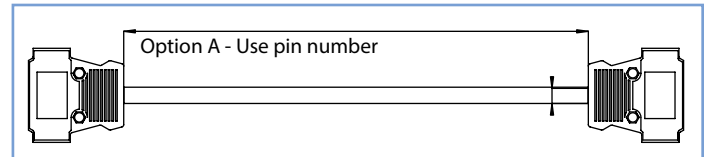
Nippon Pulse provides the Linear Shaft Motor Application Resource Tool (SMART) sizing resource for your convenience. You must be running Microsoft Excel 98 or a later version.

SMART is available at nipponpulse.com/support/manuals



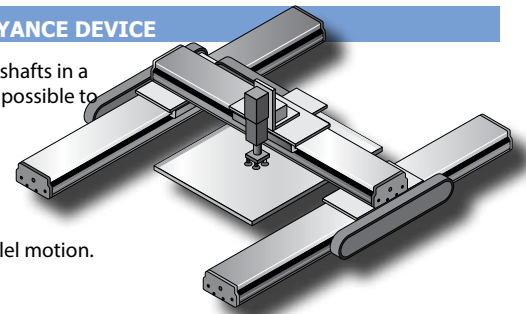
(Requires Microsoft Excel 98 or newer.)

SLP Cable Options



SUBSTRATE CONVEYANCE DEVICE

- By placing the lower shafts in a parallel position, it is possible to place the work in the central space.
- The shaft motors can be driven with one driver or in parallel motion.



Orthogonal Jig Plate for use with SLP X-Y table

When constructing a multiple-axis table that utilizes several SLP series stages, installation is exceptionally easy with the placement of the jig plate between the axes. It is 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. (Because there is a limit to the possible combinations for certain models, please use the models suitable for multiple axes.) Z-axis jig plates are also available for three-dimensional motion. Jig plates are not needed for SCR stage multi-axis arrangements.

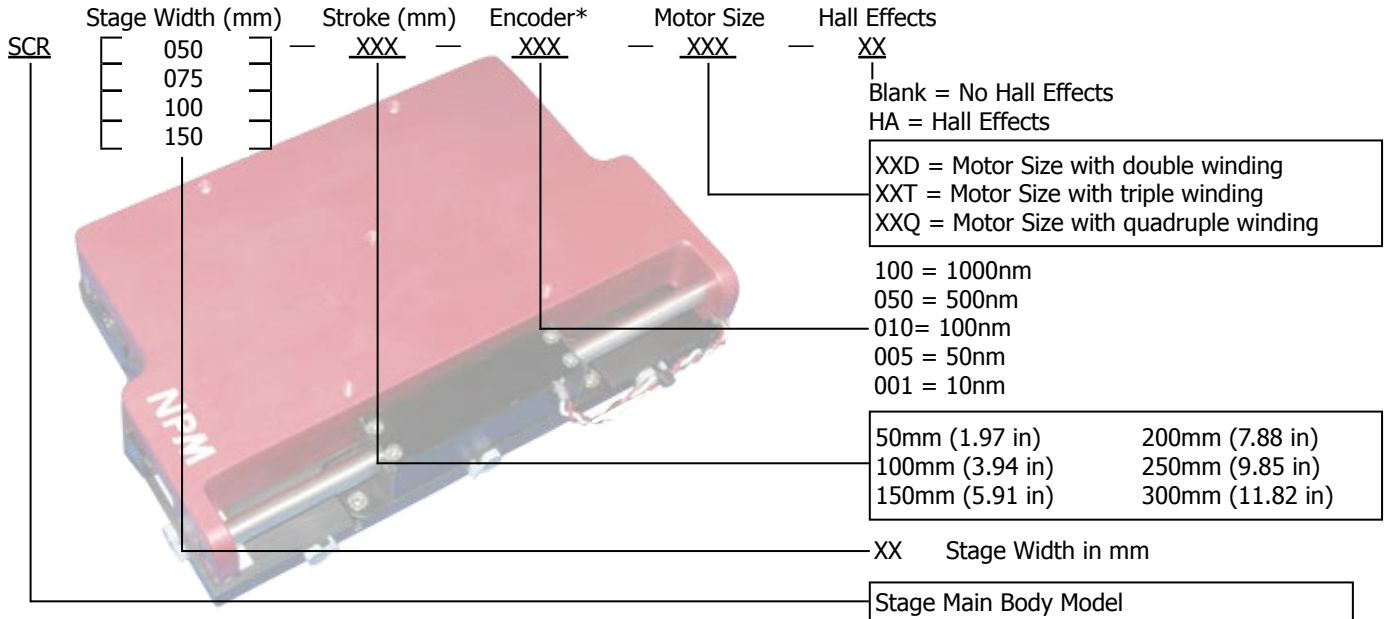
- Jig Plate A - Lower axis SLP 15, Upper axis SLP 15
- Jig Plate B - Lower axis SLP25/35, Upper axis SLP 15/25/35
- Z-axis Jig Plate - Z-axis SLP15, X-axis SLP25

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SCR Stage Part Numbering Guide

Example model number: SCR100-50-010-080Q



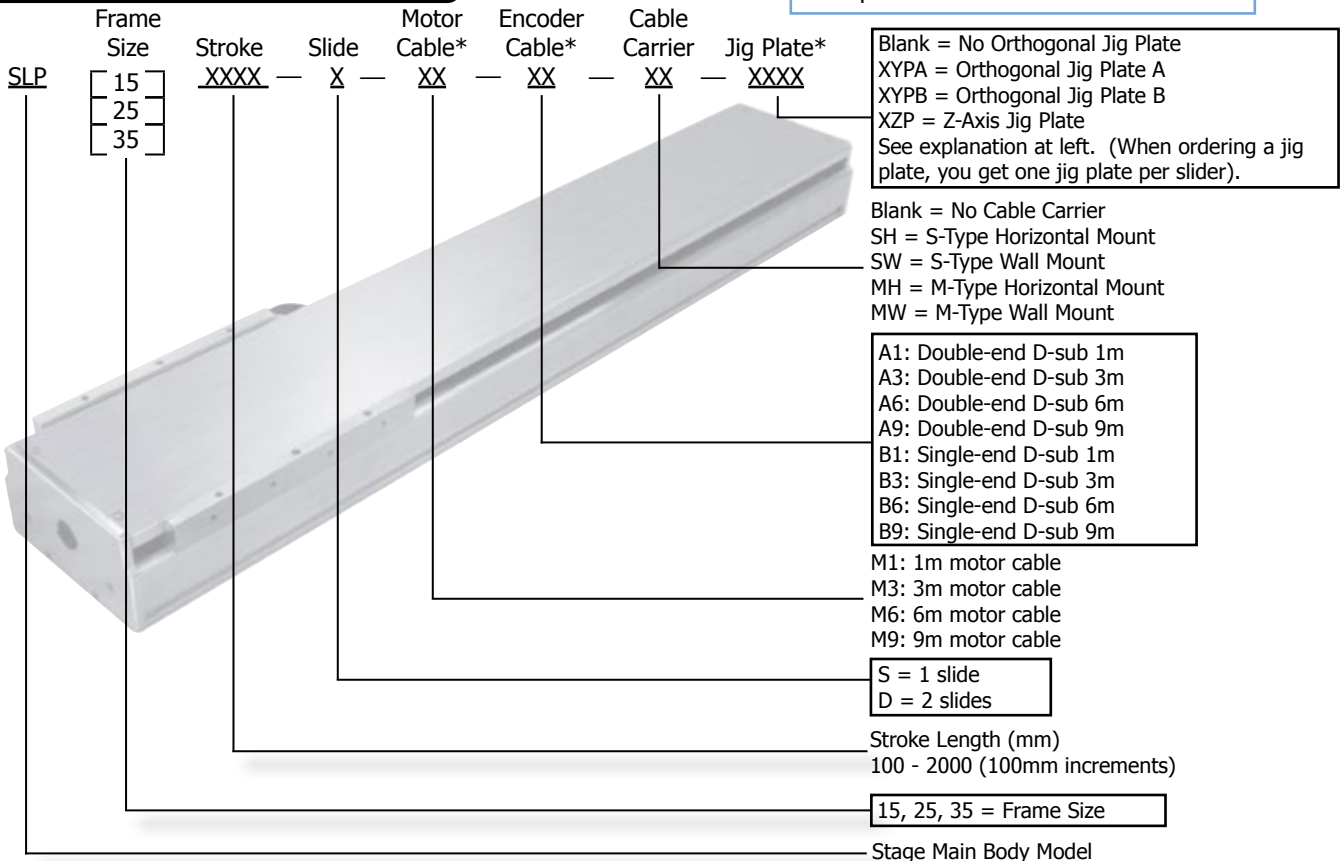
*SCR Encoder Upgrade Notice

As of September 1, 2010, all Nippon Pulse SCR Nanopositioning stages are available with an upgraded encoder. Any stage built after Sept. 1, 2010, and beginning with unit SN#080210-001, comes standard with the Renishaw Tonic Encoder.

The previous encoder was the Renishaw RGH24, which used optional and separate read switch end-of-travel limits. The Tonic Encoder includes limit switches as a part of the new read head and makes end limits standard at no additional cost. This change optimizes performance and eliminates extra wiring needed with the optional limit switches. Other benefits of using the new encoder include improving interpolation feedback by four times, achieving 5nm resolution without the use of a large RGB interpolator, and increased resolution and speed options.

SLP Stage Part Numbering Guide

Example model number: SLP15-200-S-SH

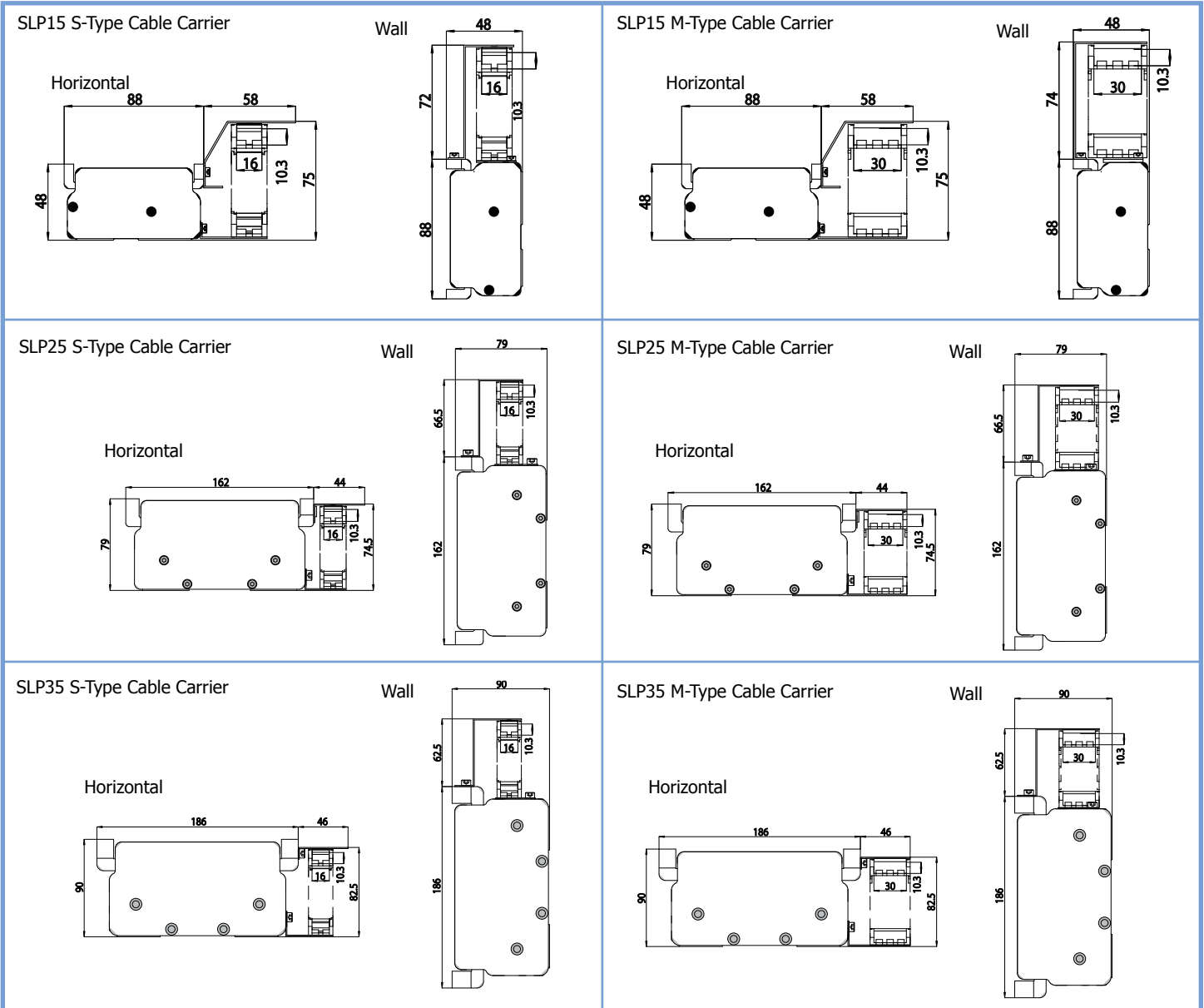


*Motor cables, encoder cables, and jig plates can be ordered separately. When ordering, add 'SL-' in front of the part number. Example: SL-A9 for a single-end D-sub 9m encoder cable or SL-XYPA for an orthogonal jig plate A.

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SLP Cable Carrier Dimensions



Custom Stages

In addition to the two standard stage series, Nippon Pulse has the ability to build custom stages to fit your applications. Please contact Nippon Pulse to speak to a local representative for more information and pricing of a custom stage unit.

To provide better support, a custom stage worksheet is available on our web site. Complete the form and return it to Nippon Pulse to make custom staging more efficient.

nipponpulse.com/support/custom-worksheets

Linear Shaft Motor

The Next Generation In Linear Motion

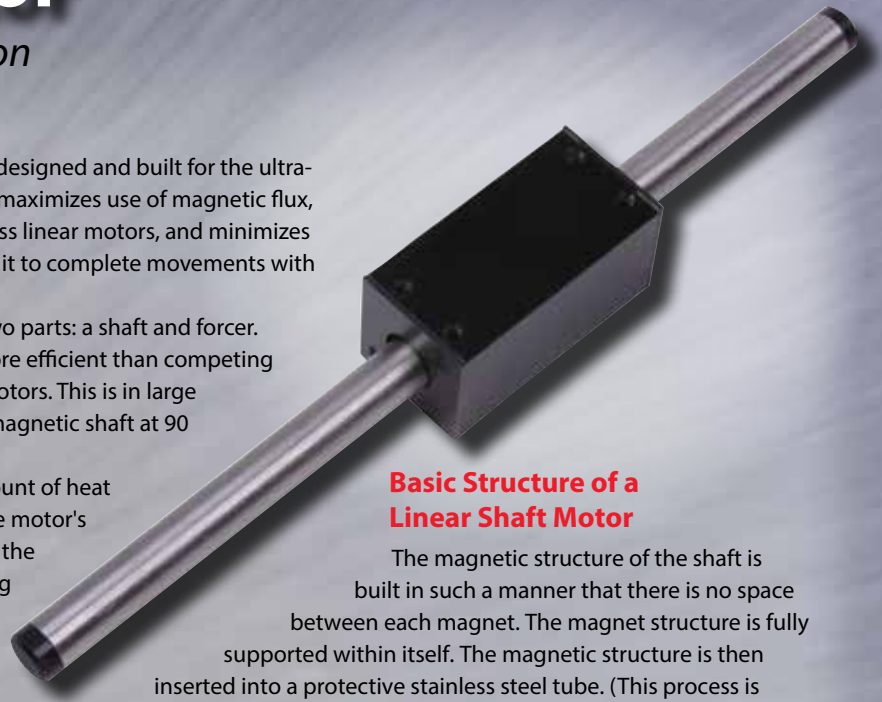
What is a Linear Shaft Motor?

Nippon Pulse's Linear Shaft Motor is the first linear motor designed and built for the ultra-high-precision market. The design of the Linear Shaft Motor maximizes use of magnetic flux, provides stiffness 100 times greater than that of other coreless linear motors, and minimizes heat production and the impact of generated heat, allowing it to complete movements with sub-micron resolutions.

The Linear Shaft Motor is a simple design, made of only two parts: a shaft and forcer. Because of its simple design, the Linear Shaft Motor is far more efficient than competing linear motors, using 50 percent less power than U-shaped motors. This is in large part because all magnetic flux created by the coils cuts the magnetic shaft at 90 degrees.

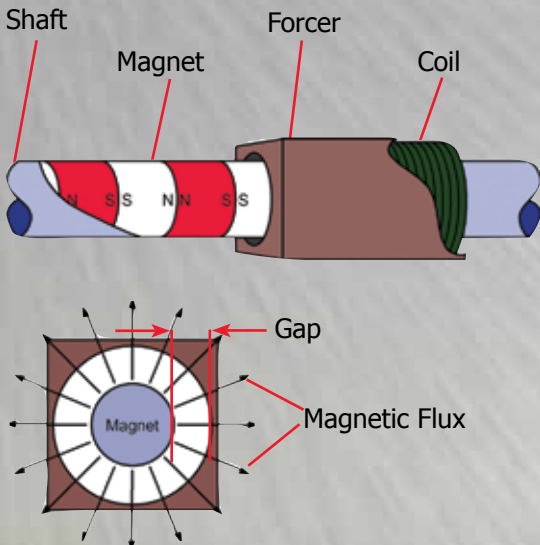
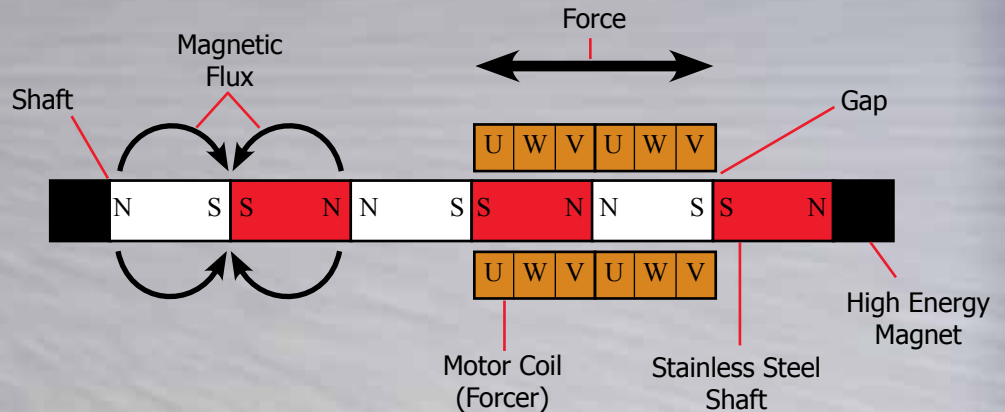
The Linear Shaft Motor is also designed to reduce the amount of heat that is dumped into the work surface, further maximizing the motor's efficiency. The Linear Shaft Motor is the only linear motor on the market that does not use an added heat sink while evaluating and documenting motor ratings.

Unlike platen linear motors, the Linear Shaft Motor does not produce Eddy currents and, because it is an ironless design, has no cogging. Unlike U-shaped linear motors, the Linear Shaft Motor does not have inherent air flow restrictions, which lead to increased heat production.



Basic Structure of a Linear Shaft Motor

The magnetic structure of the shaft is built in such a manner that there is no space between each magnet. The magnet structure is fully supported within itself. The magnetic structure is then inserted into a protective stainless steel tube. (This process is protected by numerous patents.) The process used to construct the Linear Shaft Motor produces a very strong magnetic field, twice that of other linear motors.



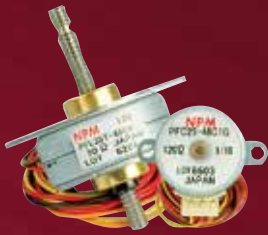
Forcer Construction

The coils of the Linear Shaft Motor are of a cylindrical design, providing a number of key advantages over other linear motors.

- The cylindrical design makes coil assembly very stiff without the use of external stiffening materials, such as the iron used by platen style-linear motors.
- The coils surround the magnets, allowing for the optimal use of all the magnetic flux. This makes the air gap (0.5~5.0mm) non-critical. (As long as the forcer does not come in contact with the shaft there is no variation in the linear force.)
- The magnetic flux cuts motor windings at right angles for maximum efficiency.
- All sides of the coil are positioned to allow for maximum dissipation of heat.
- The Linear Shaft Motor requires less current and less mass, to produce a similar force, and is more efficient than any other linear motor on the market.

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The Nippon Pulse Advantage



For more than 60 years, Nippon Pulse has built state-of-the-art products based on a solid foundation of advancing technology and thorough product research.

Nippon Pulse faithfully provides these high-quality products to a wide range of industries in North and South America and Europe. We have established ourselves as a leader in stepper motor, driver and controller technology while introducing innovative products, such as the Linear Shaft Motor. At Nippon Pulse, we believe that by bringing products to market that meet the customers' requirements and exceed expectations, we contribute to the progression of technology and its positive impact on our society.

We have representatives throughout North and South America and Europe to assist customers directly. Limited quantities of stock on standard motors and electronics are available to allow faster response to customer needs. In addition, Nippon Pulse has a model shop in its North American headquarters for quick turnaround on custom prototypes and special orders. Our mission is to faithfully create the new products sought by our customers and to contribute to the development of society from a global viewpoint.

When you choose a Nippon Pulse motor, driver, controller, network or stage, you're doing more than just buying a quality product: you're benefitting from what we call the Nippon Pulse Advantage. This includes superior prototyping, complete system engineering, proper compliance and certification according to international guidelines, exceptional tailoring to your needs, and unmatched support.

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4 Corporate Drive
Radford, Va. 24141 USA
Tel: 1-540-633-1677 • Fax: 1-540-633-1674
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