NPM Nippon Pulse
Your Partner in Motion Control

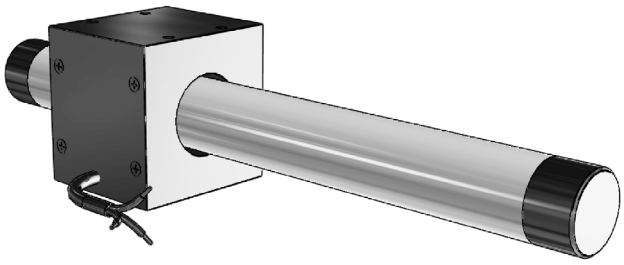
L320xS
Linear Shaft Motor

Electrical Specs	L320SS	L320DS	L320TS	L320QS
Continuous Force[1]	19N (4.27lbs)	33N (7.42lbs)	48N (10.79lbs)	59N (13.26lbs)
Continuous Current[1]	1.7Arms	1.5Arms		1.3Arms
Acceleration Force[2]	75N (16.86lbs)	132N (29.67lbs)	193N (43.39lbs)	235N (52.83lbs)
Acceleration Current[2]	6.9Arms	6.0Arms	5.9Arms	5.2Arms
Force Constant (K_f)	11N/amp (2.47lbs/amp)	22N/amp (4.95lbs/amp)	33N/amp (7.42lbs/amp)	45N/amp (10.12lbs/amp)
Back EMF (K_e)	3.6V/m/s	7.3V/m/s	11V/m/s	15V/m/s
Resistance 25°C[3]	3.6Ω	7.1Ω	11Ω	14Ω
Inductance[3]	5.1mH	7.8mH	12mH	15mH
Electric Time Constant	1.42ms	1.10ms	1.11ms	1.08ms
Fundamental Motor Constant (K_m)	5.72N√W	8.27N√W	10.01N√W	11.94N√W
Magnetic Pitch (North-North)	60mm (2.36in)			

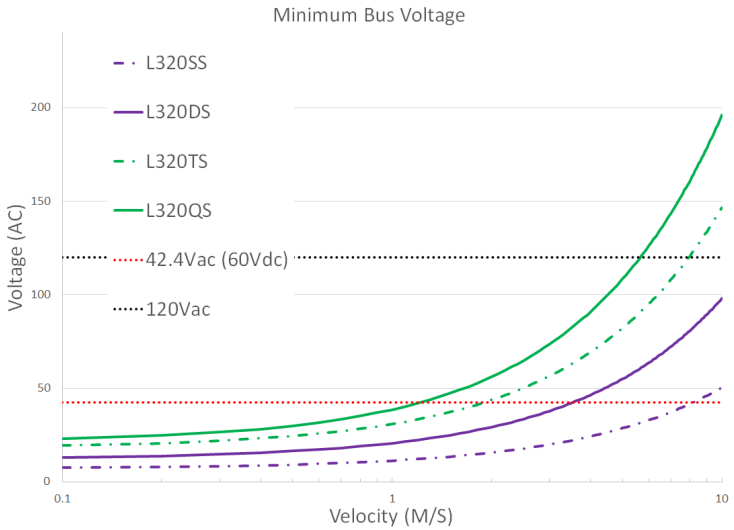
Is this the proper Linear Shaft Motor for your application? Use our SMART sizing program to assist in your decision.
This motor can be customized to fit your application demands; contact your application engineer for more information.
[1] Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking.
[2] Can be maintained for a maximum of 40 seconds. Higher forces and current possible for short periods of time,
[3] All winding parameters listed are measured line-to-line (phase-to-phase).

Thermal Specs	L320SS	L320DS	L320TS	L320QS
Max Phase Temperature[4]	135°C (275°F)			
Thermal Resistance (Coil) (K_q)	10.0°C/W (50°F/W)	6.9°C/W (44.42°F/W)	4.7°C/W (40.46°F/W)	4.5°C/W (41°F/W)

[4]The standard temperature difference between the coil and the forcer surface is 40°C.



Bus Voltage



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Forcer Specs	L320SS	L320DS	L320TS	L320QS
Forcer Length (A)	50mm (1.97in)	80mm (3.15in)	110mm (4.33in)	140mm (5.51in)
Forcer Width	60mm (2.36in)			
Forcer Screw Pitch (P)	40mm (1.57in)	70mm (2.8in)	100mm (3.94in)	130mm (5.12in)
Forcer Weight	0.44kg (0.97lbs)	0.68kg (1.50lbs)	0.98kg (2.16lbs)	1.2kg (2.65lbs)
Gap	2.5mm (0.1in)			

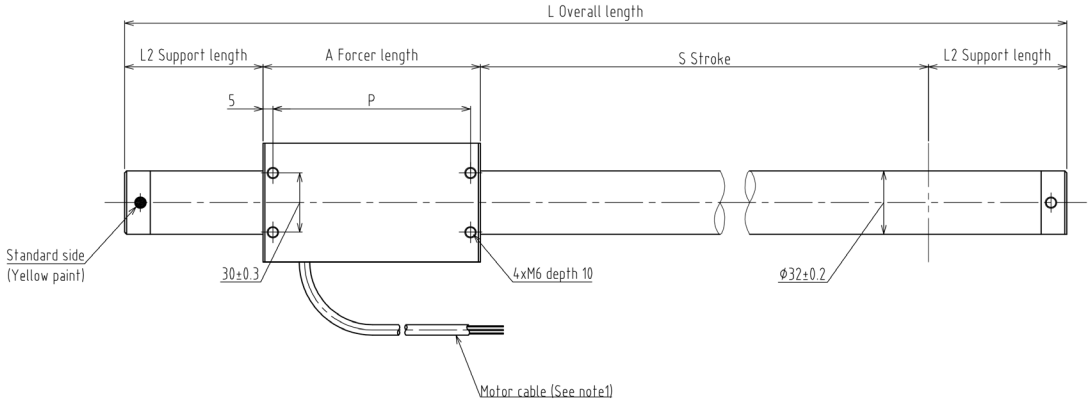
Tolerances are as follows:

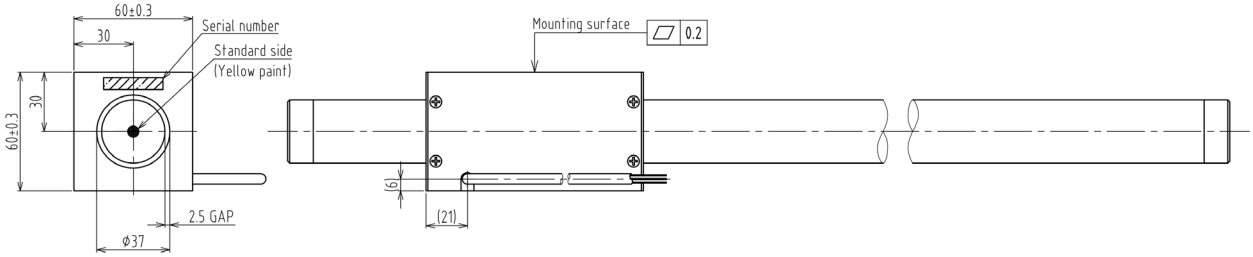
Dimension (mm)	Tolerance (mm)
0 - 6	±0.1
7 - 30	±0.2
31 - 120	±0.3
121 - 315	±0.5
316 - 1000	±0.8
1001 - 2000	±1.2
2000 -	±1.5

L = See Shaft Length
L1 = Usable Stroke + A
L2 = See Support Length
A = See Forcer Length
P = See Forcer Screw Pitch

Unless otherwise specified, dimensions are in mm

Note: Cable length 300mm. The bending radius of the motor cable should be 36.6mm (wire diameter 6.1 * 6) as suggested by the wire manufacturer. This radius should be maintained. Use supplied connector to attach the proper high-flex cable as required by your application.





Support and Bending

Stroke	Support Length (L2)	Max. Bending
0~850	50mm	0.00mm
900~1650	70mm	0.30mm
1700~max	100mm	0.70mm

Note: Metric units guaranteed. Imperial (United States customary) units are calculated.

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Linear Shaft Motor Part Numbering Guide (SS Series)

L | Shaft Size (D) | Forcer Size (A) | Alt. Winding | Usable Stroke | Options | Options | # of Forcers

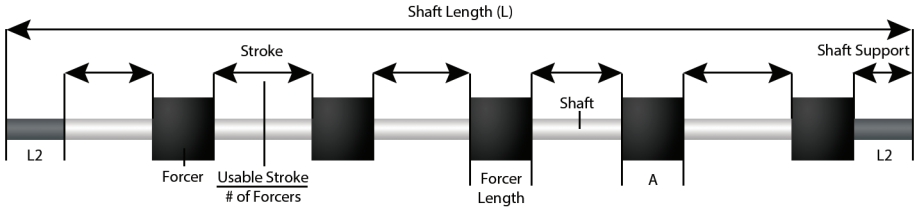
L | 250 / 320 / 350 | X | XX | XXXXst | XX | XX | XX

- **Shaft Size (D):** XX Shaft diameter in mm *10
- **Forcer Size (A):** SS Single winding small forcer; DS Double winding small forcer; TS Triple winding small forcer; QS Quadruple winding small forcer
- **Alt. Winding:** Blank Standard; _S Alternate Winding Assigned by factory based on customer needs
- **Usable Stroke:** XX Usable stroke in millimeters only needed if ordering shaft
- **Options:** WP Waterproof; HA Digital Hall Effect; CE CE type motor; FG Frameground — only needed if ordering forcer
- **Options:** Blank Standard; FO Forcer Only; SO Shaft Only
- **# of Forcers:** Two or more forcers (only for SS series)
- L Large Air Gap

Usable Stroke is = L - (L2 * 2) - (A * # of forcers)

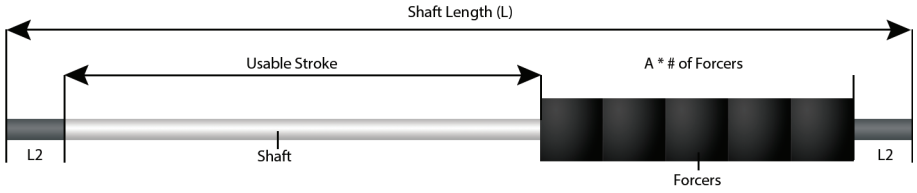
Example: For a L320SS-2500st-05
Usable stroke = 2500
L = 2950
L2 = 100
A = 50
# of Forcers = 5

Usable stroke =
= 2950 - (100 * 2) - (50 * 5)
= 2950 - 200 - 250
= 2500

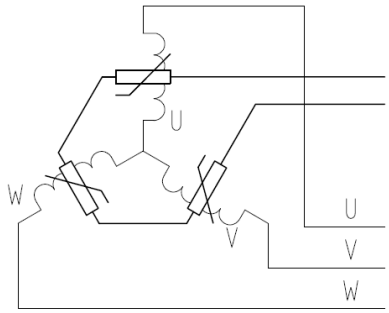


Part Numbering Example

L350SS-1500st-03: Large air gap, 35mm shaft diameter, single winding, small forcer, stroke of 1500mm, three forcers



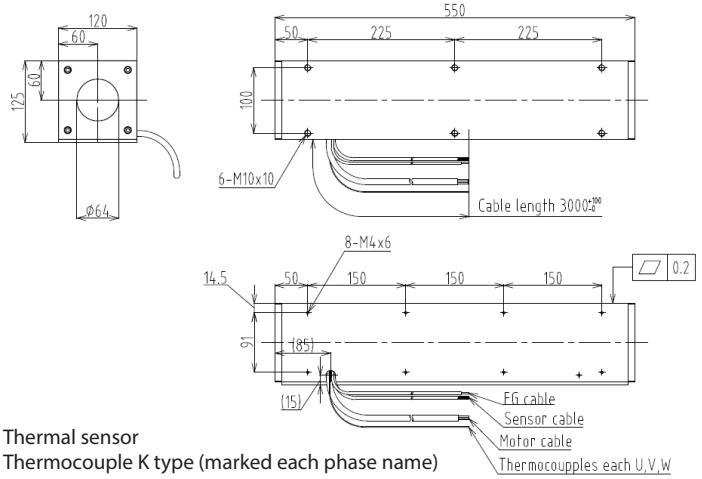
THM Option



Circuit Diagram

4. Thermistor
PTCSL20T071DBE(Vishay)

Thermocouple



Thermal sensor
Thermocouple K type (marked each phase name)
Attached to the surface of inside of coil
Length 3000mm

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