

Visit [nipponpulse.com](http://nipponpulse.com) to download 3D CAD drawings and 2D prints of this motor.

	S350D		S350T		S350Q		
Electrical Specs	S350D	S350D 1S	S350T	S350T 1S	S350Q	S350Q 4S	S350Q 1S
Continuous Force <sup>1</sup>	104N (23lbs)		148N (33lbs)		190N (43lbs)		
Continuous Current <sup>1</sup>	1.5Arms	3Arms	1.5Arms	4.5Arms	2.7Arms	1.4Arms	5.4Arms
Acceleration Force <sup>2</sup>	416N (94lbs)		592N (133lbs)		760N (171lbs)		
Acceleration Current <sup>2</sup>	6.0Arms	12Arms	6.0Arms	18Arms	11Arms	5.4Arms	22Arms
Force Constant (K <sub>f</sub> )	69N/Arms (15.5lbs/amp)	35N/Arms (7.86lbs/amp)	99N/Arms (22.18lbs/amp)	33N/Arms (7.39lbs/amp)	70N/Arms (15.8lbs/amp)	141N/Arms (31.8lbs/amp)	35N/Arms (7.9lbs/amp)
Back EMF (K <sub>e</sub> )	23V/m/s (0.59V/in/s)	12V/m/s (0.31V/in/s)	33V/m/s (0.84V/in/s)	11V/m/s (0.28V/in/s)	23V/m/s (0.58V/in/s)	47V/m/s (1.19V/in/s)	12V/m/s (0.3V/in/s)
Resistance 25°C, <sup>3</sup>	14Ω	3.5Ω	20Ω	2.2Ω	6.9Ω	28Ω	1.7Ω
Inductance <sup>3</sup>	22mH	5.5mH	33mH	3.7mH	11mH	44mH	2.7mH
Electric Time Constant	1.58ms		1.63ms		1.58ms		
Max. Rated Voltage (AC)	240V						
Fundamental Motor Constant (K <sub>m</sub> )	18.66N√W		21.95N√W		26.79N√W		
Magnetic Pitch (North-North)	120mm (4.72in)						

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.

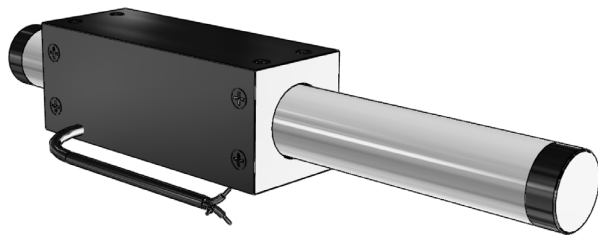
<sup>1</sup> Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking.

<sup>2</sup> Can be maintained for a maximum of 40 seconds. Higher forces and current possible for short periods of time, consult Nippon Pulse for more information.

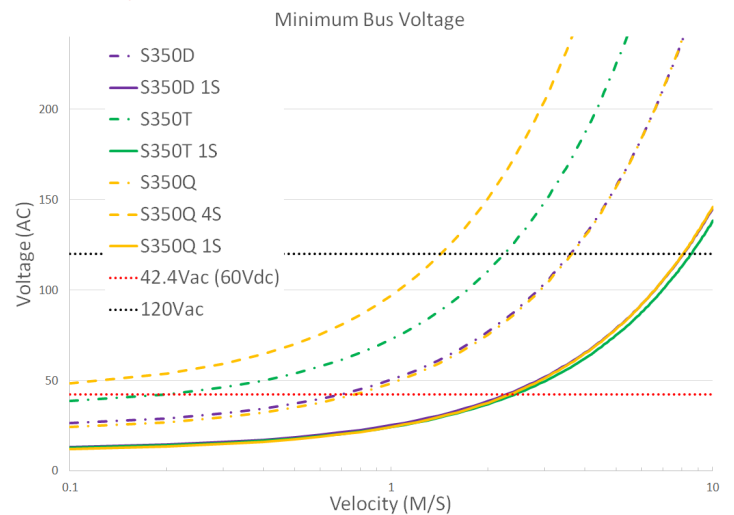
<sup>3</sup> All winding parameters listed are measured line-to-line (phase-to-phase).

Thermal Specs	S350D	S350T	S350Q
Max Phase Temperature <sup>4</sup>	135°C (275°F)		
Thermal Resistance (Coil) (K <sub>c</sub> )	3.5°C/W (38.3°F/W)	2.4°C/W (36.3°F/W)	2.2°C/W (36°F/W)

<sup>4</sup> The standard temperature difference between the coil and the forcer surface is 25°C.



### Bus Voltage



### Part Numbering System

S — Shaft Size 350

Forcer Size (A) — X

Parallel Option — XX

Usable Stroke (S) — XXXXst

Options — XX

Options — XX

D: Double (2) windings  
T: Triple (3) windings  
Q: Quadruple (4) windings

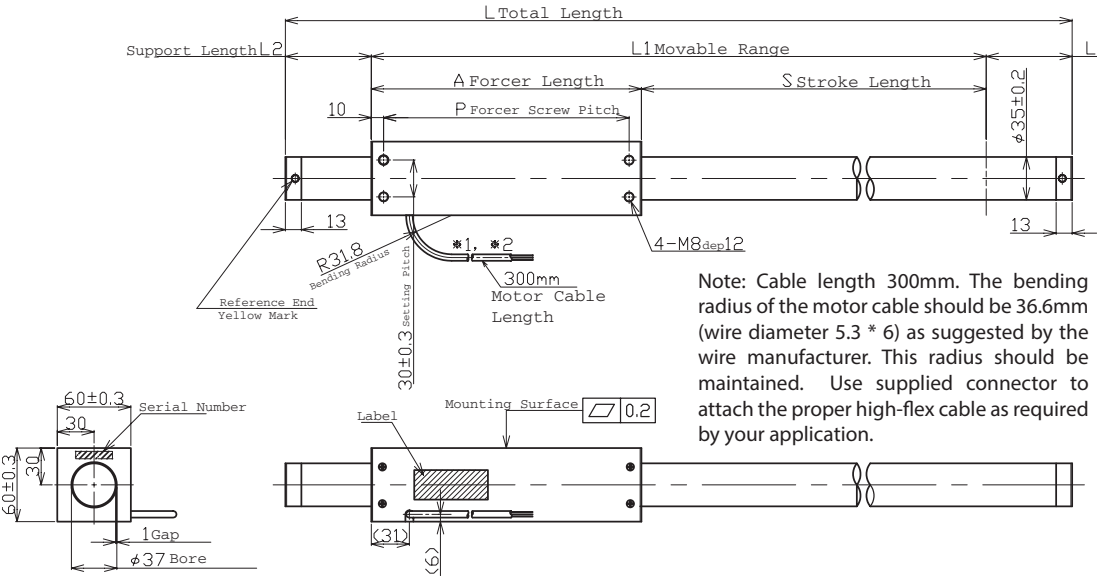
Blank: Single Motor  
PL: Parallel Motors

100-2000mm

ST: Standard  
WP: Water Resistant  
HA: Digital Hall Effect  
CE: CE type motor  
FG: Frame Ground

Blank: Standard  
FO: Forcer Only  
SO: Shaft Only

Forcer Specs	S350D	S350T	S350Q
Forcer Length (A)	160mm (6.3in)	220mm (8.7in)	280mm (11.0in)
Forcer Width	60mm (2.36in)		
Forcer Screw Pitch (P)	140mm (5.5in)	200mm (7.9in)	260mm (10.2in)
Forcer Weight	1.3kg (2.9lbs)	1.9kg (4.2lbs)	2.4kg (5.3lbs)
Gap	1.00mm (0.04in)		



Note: Cable length 300mm. The bending radius of the motor cable should be 36.6mm (wire diameter 5.3 \* 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.

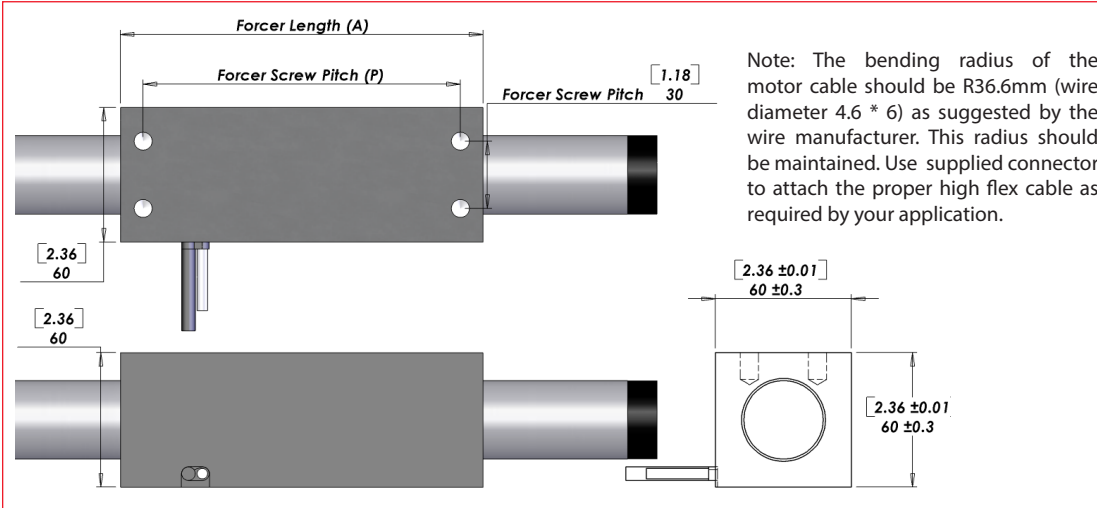
Tolerances are as follows:

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

### Hall Effect Specs



Sensor Cable Specs

Wire Type	UL 758
Wire AWG	28
VCC	White/Red
GND	White/Black
Sensor 1	Orange/Red
Sensor 2	Orange/Black
Sensor 3	Gray/Red

The bending radius of the sensor cable should be R27.6mm (wire diameter 6.1 \* 6) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high-flex cable as required by your application.

### Standard Lead Wire

Wire Type	UL 2464FA
Wire AWG	20
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads. The bending radius of the motor cable should be 36.6mm as suggested by the wire manufacturer.

### CE Option - CE Type Lead Wire

Wire Type	UL 1330
Wire AWG	24
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads. The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer. FG type with insulating sheet between coils and case. Meets all requirements of EN60034-1 (1998).

Ground Wire	CE
Wire Type	UL 1330
Wire AWG	20
Frame Ground	Green/Yellow

### Forcer Spacing Distance

Spec	S350T	S350Q
Forcer Spacing Distance	20mm	
Pole (N/S) Distance	60mm	
Forcer Length	220mm	280mm
Flip Forcers	No	Yes

Tandem S350D forcers are possible, but are equivalent to one (1) S350Q forcer and thus are not listed above.

### Tandem Forcer



## Shaft Length (L)

Stroke	S350D	S350T	S350Q
100	Stroke is less than the electrical cycle length. Contact Nippon Pulse.		
150	410mm (16.1in)	470mm (18.5in)	530mm (20.9in)
200	460mm (18.1in)	520mm (20.5in)	580mm (22.8in)
250	510mm (20.1in)	570mm (22.4in)	630mm (24.8in)
300	560mm (22in)	620mm (24.4in)	680mm (26.8in)
350	610mm (24in)	670mm (26.4in)	730mm (28.7in)
400	660mm (26in)	720mm (28.3in)	780mm (30.7in)
450	710mm (28in)	770mm (30.3in)	830mm (32.7in)
500	760mm (29.9in)	820mm (32.3in)	880mm (34.6in)
550	810mm (31.9in)	870mm (34.3in)	930mm (36.6in)
600	860mm (33.9in)	920mm (36.2in)	980mm (38.6in)
650	910mm (35.8in)	970mm (38.2in)	1030mm (40.6in)
700	960mm (37.8in)	1020mm (40.2in)	1080mm (42.5in)
750	1010mm (39.8in)	1070mm (42.1in)	1130mm (44.5in)
800	1100mm (43.3in)	1160mm (45.7in)	1220mm (48in)
850	1150mm (45.3in)	1210mm (47.6in)	1270mm (50in)
900	1200mm (47.2in)	1260mm (49.6in)	1320mm (52in)
950	1250mm (49.2in)	1310mm (51.6in)	1370mm (53.9in)
1000	1300mm (51.2in)	1360mm (53.5in)	1420mm (55.9in)
1050	1350mm (53.1in)	1410mm (55.5in)	1470mm (57.9in)
1100	1400mm (55.1in)	1460mm (57.5in)	1520mm (59.8in)
1150	1450mm (57.1in)	1510mm (59.4in)	1570mm (61.8in)
1200	1500mm (59.1in)	1560mm (61.4in)	1620mm (63.8in)
1250	1550mm (61in)	1610mm (63.4in)	1670mm (65.7in)
1300	1600mm (63in)	1660mm (65.4in)	1720mm (67.7in)
1350	1650mm (65in)	1710mm (67.3in)	1770mm (69.7in)
1400	1700mm (66.9in)	1760mm (69.3in)	1820mm (71.7in)
1450	1750mm (68.9in)	1810mm (71.3in)	1870mm (73.6in)
1500	1800mm (70.9in)	1860mm (73.2in)	1920mm (75.6in)
1550	1910mm (75.2in)	1970mm (77.6in)	2030mm (79.9in)
1600	1960mm (77.2in)	2020mm (79.5in)	2080mm (81.9in)
1650	2010mm (79.1in)	2070mm (81.5in)	2130mm (83.9in)
1700	2060mm (81.1in)	2120mm (83.5in)	2180mm (85.8in)
1750	2110mm (83.1in)	2170mm (85.4in)	2230mm (87.8in)
1800	2160mm (85in)	2220mm (87.4in)	2280mm (89.8in)
1850	2210mm (87in)	2270mm (89.4in)	2330mm (91.7in)
1900	2260mm (89in)	2320mm (91.3in)	2380mm (93.7in)
1950	2310mm (90.9in)	2370mm (93.3in)	2430mm (95.7in)
2000	2360mm (92.9in)	2420mm (95.3in)	2480mm (97.6in)

## Shaft Mass

Stroke	S350D	S350T	S350Q
100	Stroke is less than the electrical cycle length. Contact Nippon Pulse.		
150	2.7kg (6lb)	3.1kg (6.8lb)	3.5kg (7.7lb)
200	3kg (6.7lb)	3.4kg (7.6lb)	3.8kg (8.4lb)
250	3.4kg (7.4lb)	3.8kg (8.3lb)	4.2kg (9.2lb)
300	3.7kg (8.1lb)	4.1kg (9lb)	4.5kg (9.9lb)
350	4kg (8.9lb)	4.4kg (9.8lb)	4.8kg (10.6lb)
400	4.4kg (9.6lb)	4.8kg (10.5lb)	5.1kg (11.4lb)
450	4.7kg (10.3lb)	5.1kg (11.2lb)	5.5kg (12.1lb)
500	5kg (11.1lb)	5.4kg (11.9lb)	5.8kg (12.8lb)
550	5.3kg (11.8lb)	5.7kg (12.7lb)	6.1kg (13.5lb)
600	5.7kg (12.5lb)	6.1kg (13.4lb)	6.5kg (14.3lb)
650	6kg (13.2lb)	6.4kg (14.1lb)	6.8kg (15lb)
700	6.3kg (14lb)	6.7kg (14.8lb)	7.1kg (15.7lb)
750	6.7kg (14.7lb)	7.1kg (15.6lb)	7.5kg (16.4lb)
800	7.3kg (16lb)	7.7kg (16.9lb)	8.1kg (17.8lb)
850	7.6kg (16.7lb)	8kg (17.6lb)	8.4kg (18.5lb)
900	7.9kg (17.5lb)	8.3kg (18.3lb)	8.7kg (19.2lb)
950	8.3kg (18.2lb)	8.6kg (19.1lb)	9kg (19.9lb)
1000	8.6kg (18.9lb)	9kg (19.8lb)	9.4kg (20.7lb)
1050	8.9kg (19.6lb)	9.3kg (20.5lb)	9.7kg (21.4lb)
1100	9.2kg (20.4lb)	9.6kg (21.2lb)	10kg (22.1lb)
1150	9.6kg (21.1lb)	10kg (22lb)	10.4kg (22.8lb)
1200	9.9kg (21.8lb)	10.3kg (22.7lb)	10.7kg (23.6lb)
1250	10.2kg (22.6lb)	10.6kg (23.4lb)	11kg (24.3lb)
1300	10.6kg (23.3lb)	11kg (24.2lb)	11.4kg (25lb)
1350	10.9kg (24lb)	11.3kg (24.9lb)	11.7kg (25.8lb)
1400	11.2kg (24.7lb)	11.6kg (25.6lb)	12kg (26.5lb)
1450	11.6kg (25.5lb)	11.9kg (26.3lb)	12.3kg (27.2lb)
1500	11.9kg (26.2lb)	12.3kg (27.1lb)	12.7kg (27.9lb)
1550	12.6kg (27.8lb)	13kg (28.7lb)	13.4kg (29.5lb)
1600	12.9kg (28.5lb)	13.3kg (29.4lb)	13.7kg (30.3lb)
1650	13.3kg (29.3lb)	13.7kg (30.1lb)	14.1kg (31lb)
1700	13.6kg (30lb)	14kg (30.9lb)	14.4kg (31.7lb)
1750	13.9kg (30.7lb)	14.3kg (31.6lb)	14.7kg (32.5lb)
1800	14.3kg (31.4lb)	14.7kg (32.3lb)	15.1kg (33.2lb)
1850	14.6kg (32.2lb)	15kg (33lb)	15.4kg (33.9lb)
1900	14.9kg (32.9lb)	15.3kg (33.8lb)	15.7kg (34.6lb)
1950	15.2kg (33.6lb)	15.6kg (34.5lb)	16kg (35.4lb)
2000	15.6kg (34.3lb)	16kg (35.2lb)	16.4kg (36.1lb)

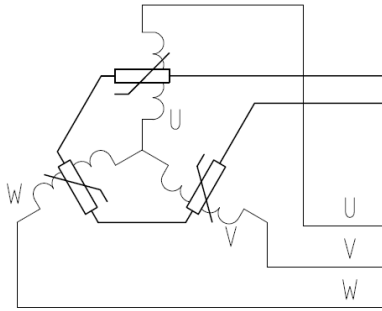
Additional stroke lengths are available (up to 2120mm for S350D, and up to 2060mm for S350T). Contact Nippon Pulse for more information.

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

[www.nipponpulse.com](http://www.nipponpulse.com)

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## 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

## Connector (Motor Cable)

Receptacle Housing	VLR-03V
Plug Housing	VLP-03V
Retainer	VLS-03V
Pin Contact	SVM-61T-P2.0
Socket Contact	SVF-61T-P2.0

To be installed by the user.

## Support and Bending

Stroke	Support Length (L2)	Max. Bending
0~750	50mm	0.00mm
751~1000	70mm	0.30mm
1001~1500	70mm	0.90mm
1501~max	100mm	1.00mm

Shaft Diameter (D) - 35mm ±0.2

Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)

Stroke lengths available from 100mm to 2500mm. Contact Nippon Pulse for more information.

For assistance in selecting the best motor for your application, contact Nippon Pulse  
to speak with an applications engineer. 1-540-633-1677

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