Nippon Pulse Linear Shaft Motor Spec Sheets

Linear Shaft Motor Part Numbering Guide

Shaft Size (D)	Forcer Size (A)	Parallel Option	Usable Stroke	Options	Options	Custom Options
S 040 080 160 200 250 320 350 427 435 500 605 1000	— X	— XX	— XXXXst	— XX	— XX	— XX

Options

Blank	Standard
FO	Forcer Only
SO	Shaft Only

WP	Waterproof
HA	Digital Hall Effect
CE	CE type motor (only needed if ordering forcer)

XX	Usable stroke in millimeters (only needed if ordering shaft)

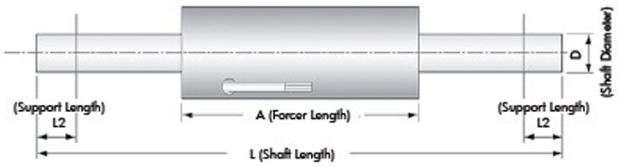
Blank	Standard
PL	Parallel Motors

S	Single winding
D	Double (2) windings
T	Triple (3) windings
Q	Quadruple (4) windings
X	Octuple (8) windings
SS	Single Coil Small Forcer
DS	Double Coil Small Forcer
TS	Triple Coil Small Forcer

XX	Shaft diameter in mm *10

S	Linear Shaft Motor
L	Long Stroke Linear Shaft Motor

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



Example: For a S080D-250

L = 310 — Stroke = 310 - (10*2) - 40
L2 = 10 — Stroke = 310 - 20 - 40
A = 40 — Stroke = 250

INDUSTRIAL SOLUTIONS

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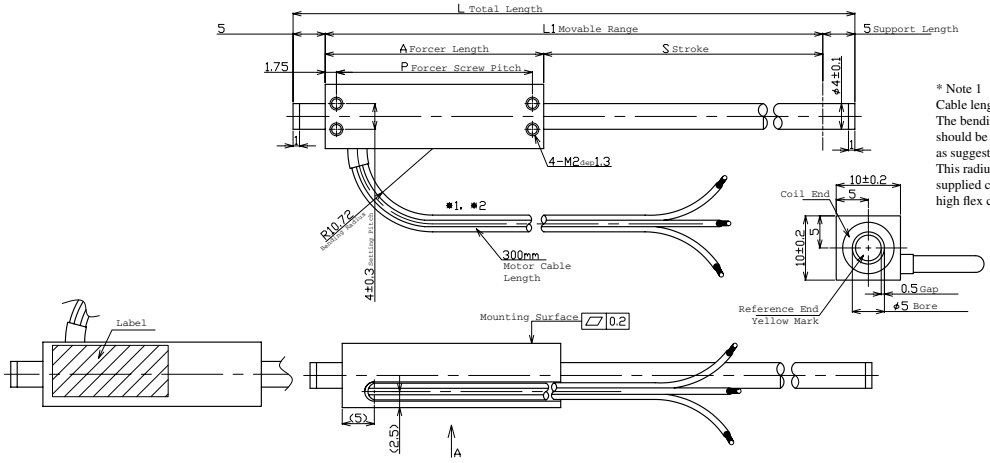
S040
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 10.72 mm (wire diameter 1.34 * 8) 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.

Electrical Specs	S040D	S040T	S040Q
Continuous Force[1]	0.29N	0.45N	0.58N
Continuous Current[1]	0.3Arms	0.3Arms	0.3Arms
Peak Force[2]	1.2N	1.8N	2.3N
Peak Current[2]	1.1Arms	1.1Arms	1.1Arms
Force Constant (K_f)	1.0N/amp	1.6N/amp	2.1N/amp
Back EMF (K_e)	0.4V/m/s	0.5V/m/s	0.7V/m/s
Resistance 25°C,[3]	11.2Ω	16.8Ω	22.4Ω
Inductance[3]	0.5mH	0.7mH	1.0mH
Electric Time Constant	0.045ms	0.042ms	0.044ms
Fundemental Motor Constant (K_m)	0.31N√W	0.39N√W	0.44N√W
Magnetic Pitch (North-North)	18mm	18mm	18mm

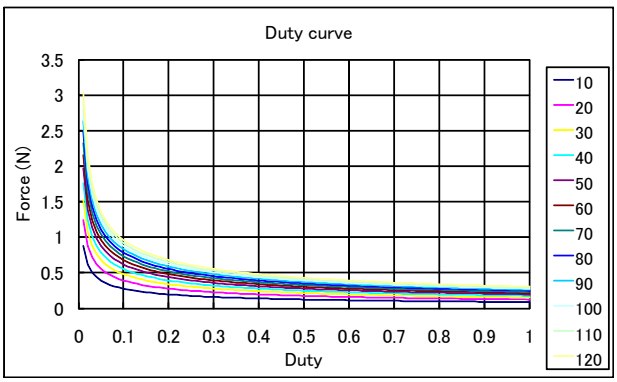
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S040D	S040T	S040Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	125.3°C	83.5°C	62.6°C

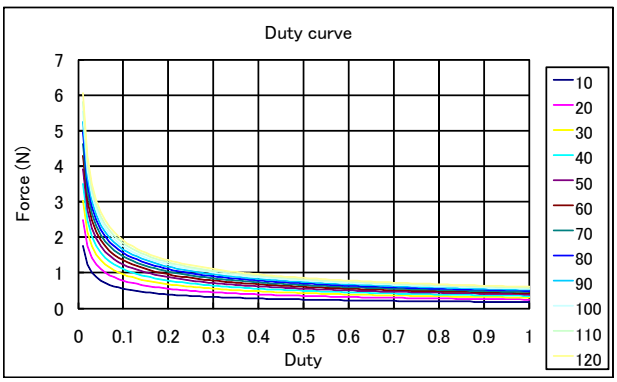
4) The standard temperature difference between the coil and the forcer surface is 10°C

Forcer Specs	S040D	S040T	S040Q
Forcer Length (A)	25mm	34mm	43mm
Forcer Width	10mm	10mm	10mm
Forcer Screw Pitch (P)	21.5mm	30.5mm	39.5mm
Forcer Weight	9g	11g	14g
Gap	0.50mm	0.50mm	0.50mm

S040D



S040Q



Shaft Length

Stroke	S040D	S040T	S040Q
20	55mm	64mm	73mm
30	65mm	74mm	83mm
40	75mm	84mm	93mm

Shaft Mass

Stroke	S040D	S040T	S040Q
20	5.5g	6.4g	7.3g
30	6.5g	7.4g	8.3g
40	7.5g	8.4g	9.3g

Shaft Diameter - 4mm ±0.1

Support and Bending

Stroke	Support Length	Max. bending
All	5mm	0mm

Lead Wire

Wire Type	UL 1430
Wire AWG	28
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 10.72mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	XMR-03V
Plug Housing	XMP-03V
Retainer	XMS-03V
Pin Contact	SXM-001T-P0.6
Socket Contact	SXA-001T-P0.6

-To be installed by the user

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S040T	S040Q
Forcer Spacing Distance	2mm	2mm
Pole (N/S) Distance	9mm	9mm
Forcer Length	34mm	43mm
Flip Forcers	No	Yes

Part Numbering System

S	—	Shaft Size (D) 040	—	Forcer Size (A) X D: Double (2) windings T: Triple (3) windings Q: Quadruple (4) windings	—	Parallel Option XX Blank: Single Motor PL: Parallel Motors	—	Usable Stroke XXXXst 20, 30, 40	—	Options XX Blank: Standard FO: Forcer Only SO: Shaft Only	—	Custom Options XX Custom code

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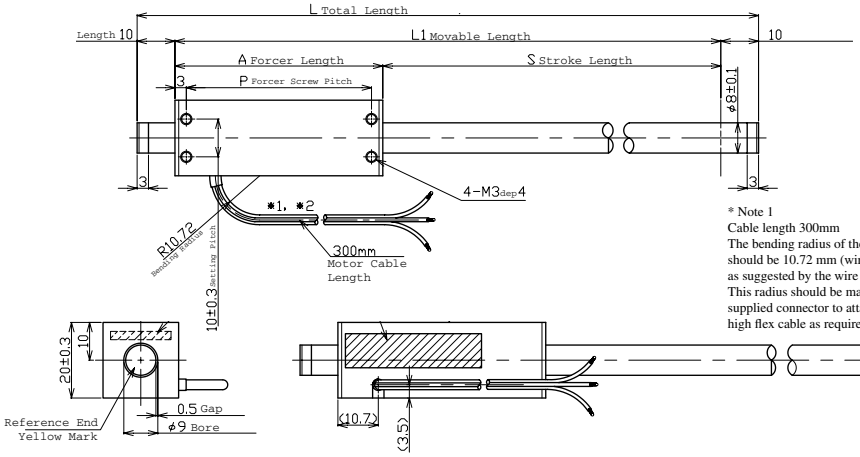
S080
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 10.72 mm (wire diameter 1.34 * 8) 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.

Electrical Specs	S080D	S080T	S080Q
Continuous Force[1]	1.8N	2.7N	3.5N
Continuous Current[1]	0.8Arms	0.8Arms	0.8Arms
Peak Force[2]	7.2N	10.8N	14N
Peak Current[2]	3.4Arms	3.4Arms	3.4Arms
Force Constant (K_f)	2.1N/Arms	3.2N/Arms	4.2N/Arms
Back EMF (K_e)	0.7V/m/s	1.1V/m/s	1.4V/m/s
Resistance 25°C,[3]	4.7Ω	6.8Ω	9.0Ω
Inductance[3]	0.7mH	1.0mH	1.3mH
Electric Time Constant	0.149ms	0.147ms	0.144ms
Fundemental Motor Constant (K_m)	0.98N√W	1.23N√W	1.39N√W
Magnetic Pitch (North-North)	30mm	30mm	30mm

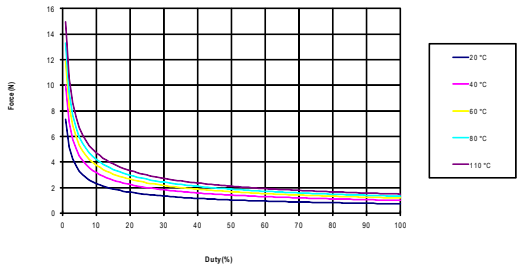
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 10cm x 20cm x 1.2cm aluminum heat sink increases continuous force up to 75%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S080D	S080T	S080Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	33.2°C/W	22.9°C/W	17.3°C/W

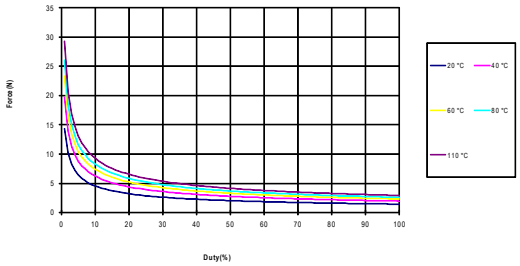
4) The standard temperature difference between the coil and the forcer surface is 10°C

Forcer Specs	S080D	S080T	S080Q
Forcer Length (A)	40mm	55mm	70mm
Forcer Width	20mm	20mm	20mm
Forcer Screw Pitch (P)	34mm	49mm	64mm
Forcer Weight	0.05g	0.06g	0.08g
Gap	0.50mm	0.50mm	0.50mm

S080D Force Duty Curve



S080Q Force Duty Curve



S080
Linear Shaft Motor

Shaft Length

Stroke	S080D	S080T	S080Q
25	85mm	100mm	115mm
50	110mm	125mm	140mm
100	160mm	175mm	190mm
150	210mm	225mm	240mm
200	260mm	275mm	290mm
250	310mm	325mm	340mm
300	360mm	375mm	390mm

Shaft Mass

Stroke	S080D	S080T	S080Q
25	0.02kg	0.03kg	0.03kg
50	0.03kg	0.04kg	0.04kg
100	0.05kg	0.05kg	0.06kg
150	0.07kg	0.07kg	0.08kg
200	0.08kg	0.09kg	0.1kg
250	0.1kg	0.11kg	0.11kg
300	0.12kg	0.12kg	0.13kg

Shaft Diameter (D) - 8mm ±0.1

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

Support and Bending

Stroke	Support Length	Max. bending
All	10mm	0.05mm

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S080T	S080Q
Forcer Spacing Distance	5mm	5mm
Pole (N/S) Distance	15mm	15mm
Forcer Length	55mm	70mm
Flip Forcers	No	Yes

Lead Wire

Wire Type	UL 1430
Wire AWG	28
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 10.72mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	XMR-03V
Plug Housing	XMP-03V
Retainer	XMS-03V
Pin Contact	SXM-001T-P0.6
Socket Contact	SXA-001T-P0.6

To be installed by the user

CE Type Motor Cable

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

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

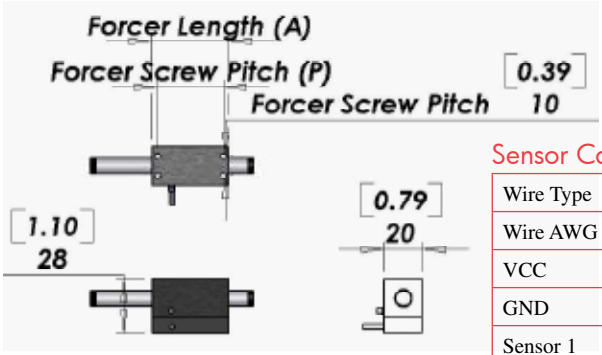
300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connection	Gray/Black

400mm lead wire bare leads
The bending radius of the motor cable should be 10.72mm as suggested by the wire manufacturer.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be 10.72 mm (wire diameter 1.34 * 8) 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.

Sensor Cable Specs

Wire Type	UL 1430
Wire AWG	28
VCC	Red
GND	Black
Sensor 1	White
Sensor 2	Blue
Sensor 3	Yellow

The bending radius of the sensor cable should be R10.72 mm (wire diameter 1.38 * 8) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high flex cable as required by your application.

Part Numbering System

S	—	Shaft Size (D)	—	Forcer Size (A)	—	Parallel Option	—	Usable Stroke	—	Options	—	Custom Options
		080		X		XX		XXXXst		XX		XX
				D: Double (2) windings T: Triple (3) windings Q: Quadruple (4) windings		Blank: Single Motor PL: Parallel Motors		25-300mm		Blank: Standard FO: Forcer Only SO: Shaft Only		Custom code

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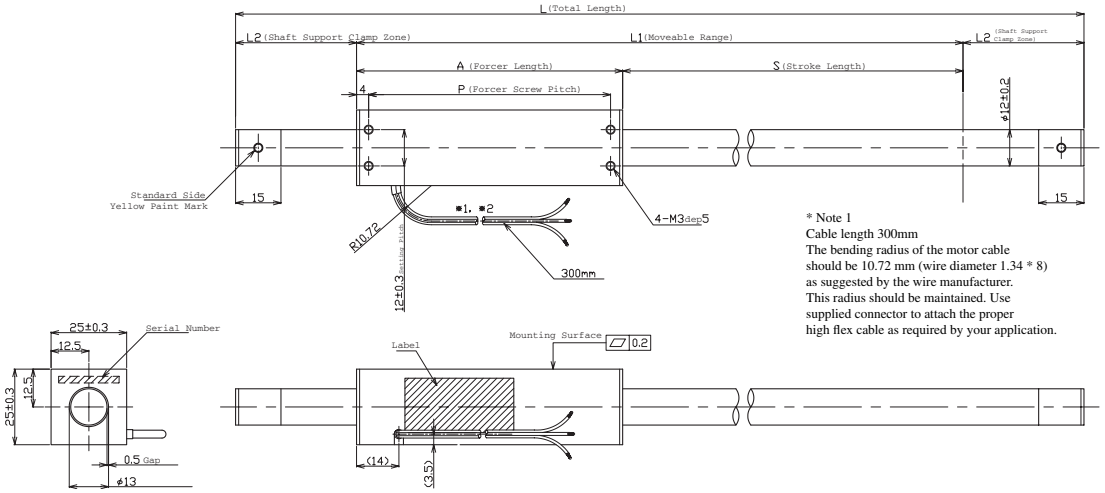
S120
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 10.72 mm (wire diameter 1.34 * 8) 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.

Electrical Specs	S120D	S120T	S120Q
Continuous Force[1]	4.5N	6.6N	8.9N
Continuous Current[1]	0.4Arms	0.4Arms	0.4Arms
Peak Force[2]	18N	27N	36N
Peak Current[2]	1.6Arms	1.6Arms	1.6Arms
Force Constant (K_t)	11N/Arms	17N/Arms	22N/Arms
Back EMF (K_e)	3.7V/m/s	5.5V/m/s	7.4V/m/s
Resistance 25°C,[3]	37Ω	54Ω	73Ω
Inductance[3]	12mH	18mH	24mH
Electric Time Constant	0.32ms	0.33ms	0.33ms
Fundemental Motor Constant (K_m)	1.82N√W	2.25N√W	2.60N√W
Magnetic Pitch (North-North)	48mm	48mm	48mm

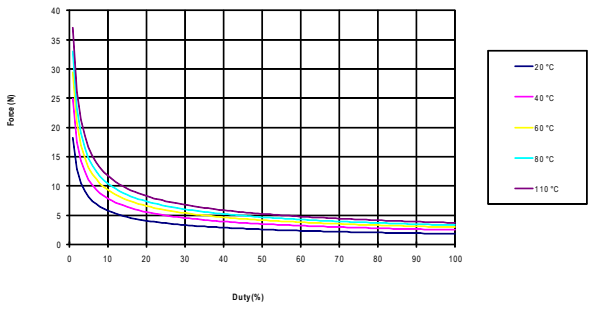
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S120D	S120T	S120Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	18.6°C	12.7°C	9.4°C

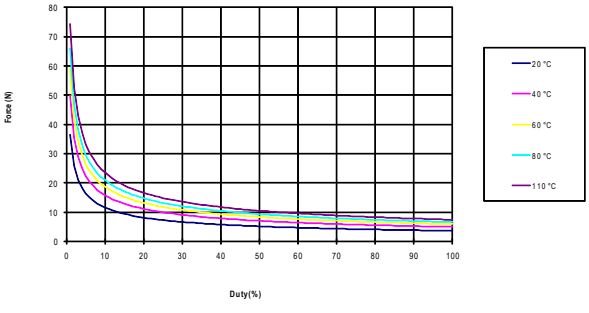
4) The standard temperature difference between the coil and the forcer surface is 10°C

Forcer Specs	S120D	S120T	S120Q
Forcer Length (A)	64mm	88mm	112mm
Forcer Width	25mm	25mm	25mm
Forcer Screw Pitch (P)	56mm	80mm	104mm
Forcer Weight	0.09kg	0.12kg	0.16kg
Gap	0.50mm	0.50mm	0.50mm

S120D Force Duty Curve



S120Q Force Duty Curve



S120
Linear Shaft Motor

Shaft Length (mm)

Stroke	S120D	S120T	S120Q
50	164	188	212
100	214	238	262
150	264	288	312
200	314	338	362
250	364	388	412
300	414	438	462
350	464	488	512
400	544	568	592
450	594	618	642
500	644	668	692
550	694	718	742
600	744	768	792
650	794	818	842
700	844	868	892
750	894	918	942
800	944	968	992
850	1034	1058	1082
900	1084	1108	1132
950	1134	1158	1182
1000	1184	1208	1232
1050	1234	1258	1282
1100	1284	1308	1332
1150	1334	1358	1382
1200	1384	1408	1432
1250	1434	1458	1482
1300	1484	1508	1532
1350	1534	1558	1582
1400	1584	1608	1632
1450	1634	1658	1682
1500	1684	1708	1732

Shaft Mass (kg)

Stroke	S120D	S120T	S120Q
50	0.1	0.1	0.1
100	0.1	0.2	0.2
150	0.2	0.2	0.2
200	0.2	0.2	0.3
250	0.3	0.3	0.3
300	0.3	0.3	0.3
350	0.3	0.4	0.4
400	0.4	0.4	0.4
450	0.4	0.5	0.5
500	0.5	0.5	0.5
550	0.5	0.5	0.6
600	0.6	0.6	0.6
650	0.6	0.6	0.6
700	0.6	0.7	0.7
750	0.7	0.7	0.7
800	0.7	0.7	0.7
850	0.8	0.8	0.8
900	0.8	0.8	0.8
950	0.8	0.9	0.9
1000	0.9	0.9	0.9
1050	0.9	0.9	1
1100	1	1	1
1150	1	1	1
1200	1	1.1	1.1
1250	1.1	1.1	1.1
1300	1.1	1.2	1.2
1350	1.2	1.2	1.2
1400	1.2	1.2	1.3
1450	1.3	1.3	1.3
1500	1.3	1.3	1.3

Shaft Diameter (D) - 12mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)

Lead Wire

Wire Type	UL 1430
Wire AWG	28
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 10.72mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	XMR-03V
Plug Housing	XMP-03V
Retainer	XMS-03V
Pin Contact	SXM-001T-P0.6
Socket Contact	SXA-001T-P0.6

To be installed by the user

CE Type Motor Cable

Wire Type	UL 1330
Wire AWG	24
U Phase	Red
V Phase	White
W Phase	Black
Ground Wire	CE
Wire Type	UL 1330
Wire AWG	20
Frame Ground	Green/Yellow

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

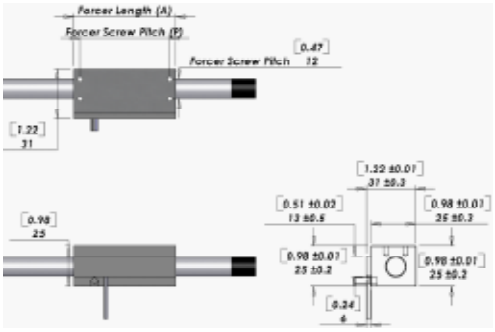
Wire Type	UL 758
Wire AWG	28
VCC	White/Red
GND	White/Black
Sensor 1	Orange/Red
Sensor 2	Orange/Black
Sensor 3	Gray/Red
No Connection	Gray/Black

400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~350	25mm	0.00mm
351~800	40mm	0.30mm
801~max.	60mm	0.50mm

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6 mm (wire diameter 4.6 * 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.

Sensor Cable Specs

Wire Type	UL 1430
Wire AWG	28
VCC	Red
GND	Black
Sensor 1	White
Sensor 2	Blue
Sensor 3	Yellow

The bending radius of the sensor cable should be R10.72 mm (wire diameter 1.38 * 8) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high flex cable as required by your application.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S120T	S120Q
Forcer Spacing Distance	8mm	8mm
Pole (N/S) Distance	24mm	24mm
Forcer Length	88mm	112mm
Flip Forcers	No	Yes

Part Numbering System

	Shaft Size (D)	Forcer Size (A)	Parallel Option	Usable Stroke	Options	Custom Options
S —	120 —	X —	XX —	XXXXst —	XX —	XX
		D: Double (2) windings T: Triple (3) windings Q: Quadruple (4) windings	Blank: Single Motor PL: Parallel Motors	25-300mm	Blank: Standard FO: Forcer Only SO: Shaft Only	Custom code

NPM Nippon Pulse
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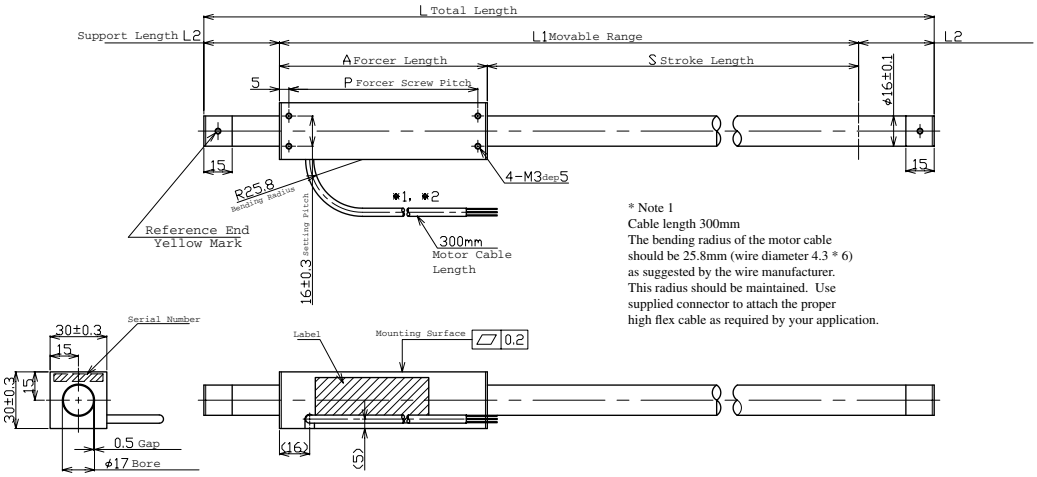
S160
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 25.8mm (wire diameter 4.3 * 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.

Electrical Specs	S160D	S160T	S160Q
Continuous Force[1]	10N	15N	20N
Continuous Current[1]	0.6Arms	0.6Arms	0.6Arms
Peak Force[2]	40N	60N	80N
Peak Current[2]	2.5Arms	2.5Arms	2.5Arms
Force Constant (K_t)	16N/Arms	24N/Arms	33N/Arms
Back EMF (K_e)	5.4V/m/s	8.1V/m/s	11V/m/s
Resistance 25°C,[3]	21Ω	33Ω	43Ω
Inductance[3]	8.2mH	12mH	16mH
Electric Time Constant	0.39ms	0.36ms	0.37ms
Fundemental Motor Constant (K_m)	3.51N√W	4.20N√W	4.96N√W
Magnetic Pitch (North-North)	60mm	60mm	60mm

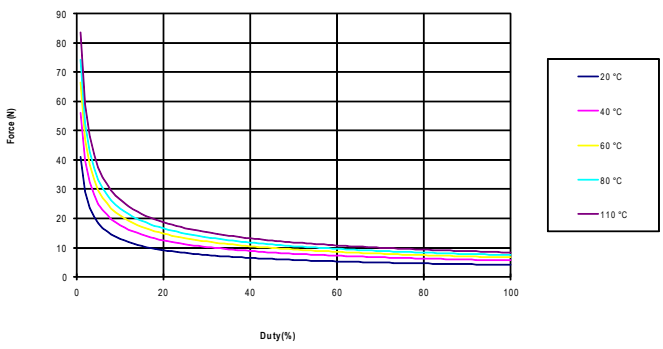
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 10cm x 20cm x 1.2cm aluminum heat sink increases continuous force up to 30%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S160D	S160T	S160Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	13.6°C	8.7°C	6.7°C

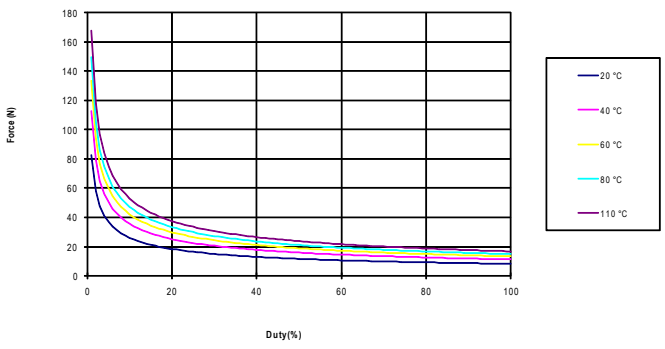
4) The standard temperature difference between the coil and the forcer surface is 15°C

Forcer Specs	S160D	S160T	S160Q
Forcer Length (A)	80mm	110mm	140mm
Forcer Width	30mm ±0.3	30mm ±0.3	30mm ±0.3
Forcer Screw Pitch (P)	70mm	100mm	130mm
Forcer Weight	0.15kg	0.20kg	0.30kg
Gap	0.50mm	0.50mm	0.50mm

S160D Force Duty Curve



S160Q Force Duty Curve



S160
Linear Shaft Motor

Shaft Length (mm)

Stroke	S160D	S160T	S160Q
100	230	260	290
150	280	310	340
200	330	360	390
250	380	410	440
300	430	460	490
350	480	510	540
400	560	590	620
450	610	640	670
500	660	690	720
550	710	740	770
600	760	790	820
650	810	840	870
700	860	890	920
750	910	940	970
800	960	990	1020
850	1050	1080	1110
900	1100	1130	1160
950	1150	1180	1210
1000	1200	1230	1260
1050	1250	1280	1310
1100	1300	1330	1360
1150	1350	1380	1410
1200	1400	1430	1460
1250	1450	1480	1510
1300	1500	1530	1560
1350	1550	1580	1610
1400	1600	1630	1660
1450	1650	1680	1710
1500	1700	1730	1760
1550	1750	1780	1810
1600	1800	1830	1860
1650	1850	1880	1910
1700	1900	1930	1960
1750	1950	1980	2010
1800	2000	2030	2060

Shaft Mass (kg)

Stroke	S160D	S160T	S160Q
100	0.28	0.33	0.37
150	0.35	0.4	0.44
200	0.42	0.47	0.51
250	0.49	0.54	0.58
300	0.56	0.61	0.65
350	0.64	0.68	0.72
400	0.72	0.77	0.81
450	0.79	0.84	0.88
500	0.86	0.91	0.95
550	0.93	1	1
600	1	1	1.1
650	1.1	1.1	1.2
700	1.1	1.2	1.2
750	1.2	1.3	1.3
800	1.3	1.3	1.4
850	1.4	1.4	1.5
900	1.5	1.5	1.5
950	1.5	1.6	1.6
1000	1.6	1.6	1.7
1050	1.7	1.7	1.7
1100	1.7	1.8	1.8
1150	1.8	1.9	1.9
1200	1.9	1.9	2
1250	2	2	2
1300	2	2.1	2.1
1350	2.1	2.2	2.2
1400	2.2	2.2	2.3
1450	2.3	2.3	2.3
1500	2.3	2.4	2.4
1550	2.4	2.4	2.5
1600	2.5	2.5	2.6
1650	2.6	2.6	2.6
1700	2.6	2.7	2.7
1750	2.7	2.7	2.8

Shaft Diameter (D) - 16mm ±0.1

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

Lead Wire

Wire Type	UL 2464FA
Wire AWG	25
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 25.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	XMR-03V
Plug Housing	XMP-03V
Retainer	XMS-03V
Pin Contact	SXM-001T-P0.6
Socket Contact	SXA-001T-P0.6

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

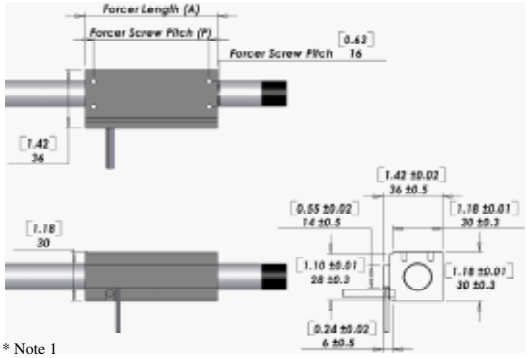
Wire Type	UL 758
Wire AWG	28
VCC	White/Red
GND	White/Black
Sensor 1	Orange/Red
Sensor 2	Orange/Black
Sensor 3	Gray/Red
No Connec.	Gray/Black

400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~350	25mm	0.00mm
351~500	40mm	0.30mm
501~800	40mm	0.50mm
801~max	60mm	0.50mm

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R 26.4mm (wire diameter 4.4 * 6) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high flex cable as required by your application.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S160T	S160Q
Forcer Spacing Distance	10mm	10mm
Pole (N/S) Distance	30mm	30mm
Forcer Length	110mm	140mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D) 160 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-1800mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

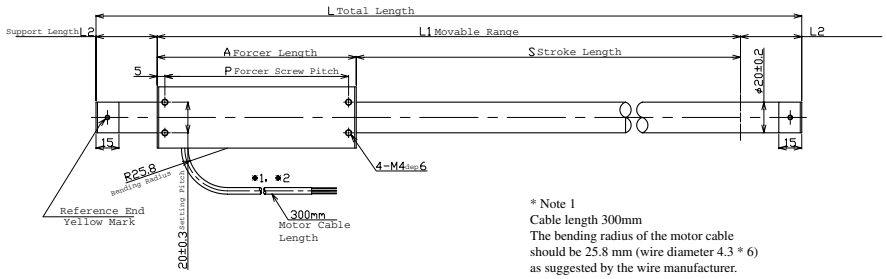
NPM Nippon Pulse
Your Partner in Motion Control

S200
Linear Shaft Motor

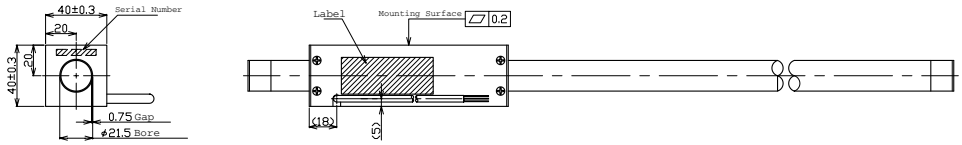
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 25.8 mm (wire diameter 4.3 * 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.



Electrical Specs	S200D	S200T	S200Q
Continuous Force[1]	18N	28N	38N
Continuous Current[1]	0.6Arms	0.6Arms	0.6Arms
Peak Force[2]	72N	112N	152N
Peak Current[2]	2.4Arms	2.4Arms	2.4Arms
Force Constant (K_t)	31N/Arms	47N/Arms	64N/Arms
Back EMF (K_e)	10V/m/s	16V/m/s	21V/m/s
Resistance 25°C,[3]	28.7Ω	43Ω	56Ω
Inductance[3]	19.3mH	29mH	39mH
Electric Time Constant	0.67ms	0.67ms	0.70ms
Fundemental Motor Constant (K_m)	5.70N√W	7.24N√W	8.61N√W
Magnetic Pitch (North-North)	72mm	72mm	72mm

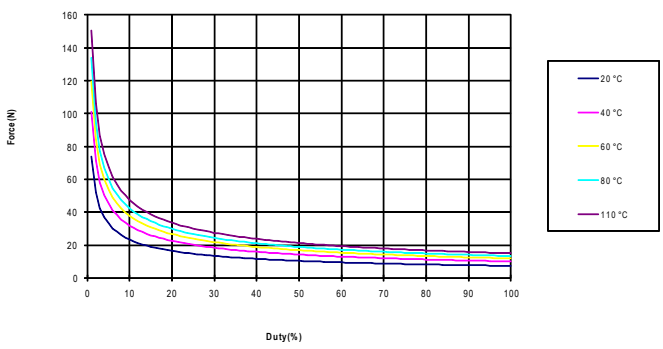
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S200D	S200T	S200Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	11°C	7.3°C	5.6°C

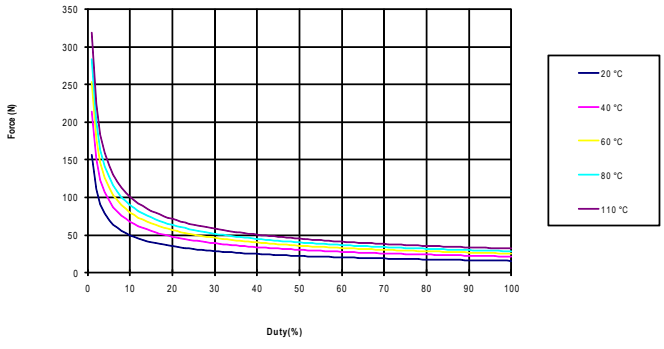
4) The standard temperature difference between the coil and the forcer surface is 20°C

Forcer Specs	S200D	S200T	S200Q
Forcer Length (A)	94mm	130mm	166mm
Forcer Width	40mm	40mm	40mm
Forcer Screw Pitch (P)	84mm	120mm	156mm
Forcer Weight	0.30kg	0.50kg	0.70kg
Gap	0.75mm	0.75mm	0.75mm

S200D Force Duty Curve



S200Q Force Duty Curve



S200
Linear Shaft Motor

Shaft Length (mm)

Stroke	S200D	S200T	S200Q
100	244	280	316
150	294	330	366
200	344	380	416
250	394	430	466
300	444	480	516
350	524	560	596
400	574	610	646
450	624	660	696
500	674	710	746
550	724	760	796
600	774	810	846
650	824	860	896
700	874	910	946
750	964	1000	1036
800	1014	1050	1086
850	1064	1100	1136
900	1114	1150	1186
950	1164	1200	1236
1000	1214	1250	1286
1050	1264	1300	1336
1100	1314	1350	1386
1150	1364	1400	1436
1200	1414	1450	1486
1250	1464	1500	1536
1300	1514	1550	1586
1350	1564	1600	1636
1400	1614	1650	1686
1450	1664	1700	1736
1500	1714	1750	1786
1550	1764	1800	1836
1600	1814	1850	1886
1650	1864	1900	1936
1700	1914	1950	1986
1750	1964	2000	2036
1800	2014	2050	2086
1850	2064	2100	2136
1900	2114	2150	2186
1950	2164	2200	2236
2000	2214	2250	2286

Shaft Mass (kg)

Stroke	S200D	S200T	S200Q
100	0.5	0.6	0.6
150	0.6	0.7	0.7
200	0.7	0.8	0.9
250	0.8	0.9	1
300	0.9	1	1.1
350	1.1	1.1	1.2
400	1.2	1.2	1.3
450	1.3	1.4	1.4
500	1.4	1.5	1.5
550	1.5	1.6	1.6
600	1.6	1.7	1.8
650	1.7	1.8	1.9
700	1.8	1.9	2
750	2	2	2.1
800	2.1	2.2	2.2
850	2.2	2.3	2.3
900	2.3	2.4	2.5
950	2.4	2.5	2.6
1000	2.5	2.6	2.7
1050	2.6	2.7	2.8
1100	2.7	2.8	2.9
1150	2.8	2.9	3
1200	3	3	3.1
1250	3.1	3.1	3.2
1300	3.2	3.3	3.3
1350	3.3	3.4	3.4
1400	3.4	3.5	3.6
1450	3.5	3.6	3.7
1500	3.6	3.7	3.8
1550	3.7	3.8	3.9
1600	3.8	3.9	4
1650	3.9	4	4.1
1700	4.1	4.1	4.2
1750	4.2	4.2	4.3
1800	4.3	4.4	4.4
1850	4.4	4.5	4.5
1900	4.5	4.6	4.7
1950	4.6	4.7	4.8
2000	4.7	4.8	4.9

Lead Wire

Wire Type	UL 2464FA
Wire AWG	25
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 25.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	XMR-03V
Plug Housing	XMP-03V
Retainer	XMS-03V
Pin Contact	SXM-001T-P0.6
Socket Contact	SXA-001T-P0.6

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

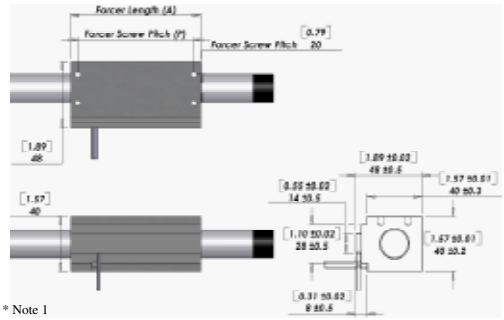
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~300	25mm	0.00mm
301~700	40mm	0.30mm
701~1000	60mm	0.70mm
1001~max	60mm	0.90mm

Shaft Diameter (D) - 20mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available up to 2700mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R26.4mm (wire diameter 4.4 * 6) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high flex cable as required by your application.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S200T	S200Q
Forcer Spacing Distance	14mm	14mm
Pole (N/S) Distance	36mm	36mm
Forcer Length	130mm	166mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D) 200 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2000mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

NPM Nippon Pulse
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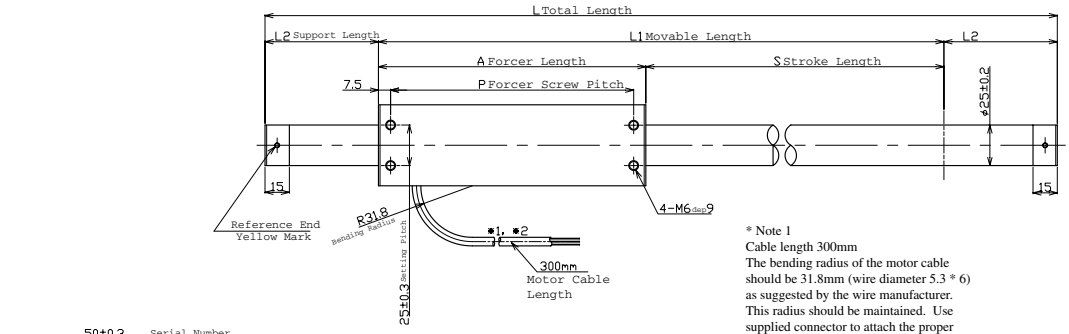
S250
Linear Shaft Motor

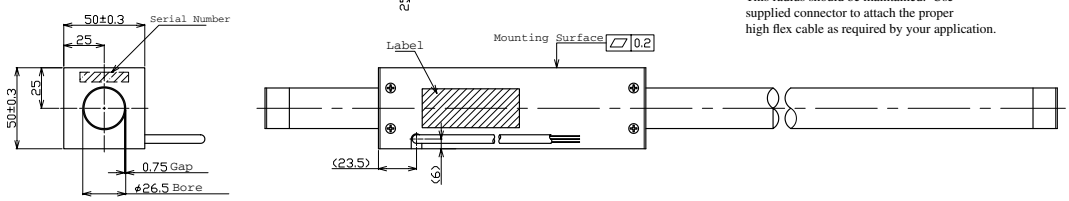
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 31.8mm (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.



Electrical Specs	S250D	S250T	S250Q	S250X
Continuous Force[1]	40N	60N	75N	140N
Continuous Current[1]	1.3Arms	1.3Arms	1.3Arms	2.4Arms
Peak Force[2]	160N	240N	300N	560N
Peak Current[2]	5.1Arms	5.1Arms	5.1Arms	9.6Arms
Force Constant (K_t)	31N/Arms	47N/Arms	59N/Arms	58N/Arms
Back EMF (K_e)	10.4V/m/s	16V/m/s	20V/m/s	19V/m/s
Resistance 25°C,[3]	7.8Ω	12Ω	15Ω	7.5Ω
Inductance[3]	9.8mH	15mH	19mH	9.5mH
Electric Time Constant	1.26ms	1.25ms	1.27ms	1.27ms
Fundemental Motor Constant (K_m)	11.19N√W	13.53N√W	15.13N√W	21.30N√W
Magnetic Pitch (North-North)	90mm	90mm	90mm	90mm

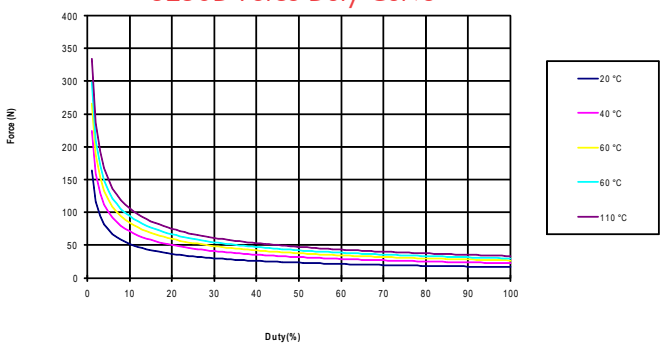
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S250D	S250T	S250Q	S250X
Max Phase Temperature[4]	135°C	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	8.6°C	5.6°C	4.5°C	2.5°C

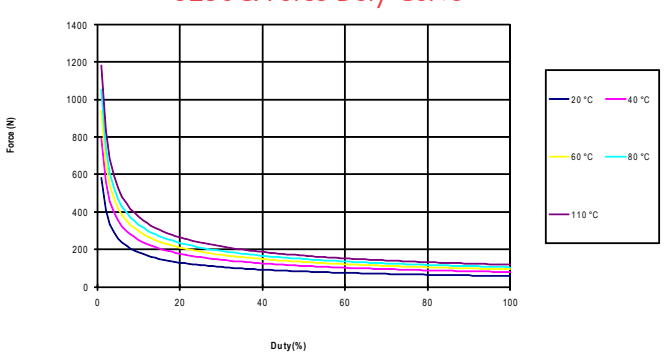
4) The standard temperature difference between the coil and the forcer surface is 20°C

Forcer Specs	S250D	S250T	S250Q	S250X
Forcer Length (A)	120mm	165mm	210mm	390mm
Forcer Width	50mm	50mm	50mm	50mm
Forcer Screw Pitch (P)	105mm	150mm	195mm	375mm
Forcer Weight	0.80kg	1.1kg	1.5kg	2.9kg
Gap	0.75mm	0.75mm	0.75mm	0.75mm

S250D Force Duty Curve



S250Q Force Duty Curve



S250
Linear Shaft Motor

Shaft Length (mm)

Stroke	S250D	S250T	S250Q	S250X
100	320	365	410	590
150	370	415	460	640
200	420	465	510	690
250	470	515	560	740
300	520	565	610	790
350	570	615	660	840
400	620	665	710	890
450	670	715	760	940
500	720	765	810	990
550	770	815	860	1080
600	820	865	910	1130
650	870	915	960	1180
700	920	965	1010	1230
750	1010	1055	1100	1280
800	1060	1105	1150	1330
850	1110	1155	1200	1380
900	1160	1205	1250	1430
950	1210	1255	1300	1480
1000	1260	1305	1350	1530
1050	1310	1355	1400	1580
1100	1360	1405	1450	1630
1150	1410	1455	1500	1680
1200	1460	1505	1550	1730
1250	1510	1555	1600	1780
1300	1560	1605	1650	1830
1350	1610	1655	1700	1940
1400	1660	1705	1750	1990
1450	1710	1755	1800	2040
1500	1760	1805	1850	2090
1550	1870	1915	1960	2140
1600	1920	1965	2010	2190
1650	1970	2015	2060	2240
1700	2020	2065	2110	2290
1750	2070	2115	2160	2340
1800	2120	2165	2210	2390
1850	2170	2215	2260	2440
1900	2220	2265	2310	2490
1950	2270	2315	2360	2540
2000	2320	2365	2410	2590

Shaft Mass (kg)

Stroke	S250D	S250T	S250Q	S250X
100	0.9	1.1	1.2	1.8
150	1.1	1.2	1.4	2
200	1.2	1.4	1.6	2.2
250	1.4	1.6	1.7	2.3
300	1.6	1.7	1.9	2.5
350	1.8	1.9	2.1	2.7
400	1.9	2.1	2.2	2.9
450	2.1	2.3	2.4	3
500	2.3	2.4	2.6	3.2
550	2.4	2.6	2.8	3.4
600	2.6	2.8	2.9	3.5
650	2.8	2.9	3.1	3.7
700	3	3.1	3.3	3.9
750	3.2	3.4	3.5	4.1
800	3.4	3.5	3.7	4.3
850	3.5	3.7	3.8	4.5
900	3.7	3.9	4	4.6
950	3.9	4	4.2	4.8
1000	4.1	4.2	4.4	5
1050	4.2	4.4	4.5	5.2
1100	4.4	4.6	4.7	5.3
1150	4.6	4.7	4.9	5.5
1200	4.7	4.9	5.1	5.7
1250	4.9	5.1	5.2	5.8
1300	5.1	5.2	5.4	6
1350	5.3	5.4	5.6	6.2
1400	5.4	5.6	5.7	6.4
1450	5.6	5.8	5.9	6.5
1500	5.8	5.9	6.1	6.7
1550	6	6.2	6.3	7
1600	6.2	6.3	6.5	7.1
1650	6.3	6.5	6.6	7.3
1700	6.5	6.7	6.8	7.4
1750	6.7	6.8	7	7.6
1800	6.9	7	7.2	7.8
1850	7	7.2	7.3	8
1900	7.2	7.4	7.5	8.1
1950	7.4	7.5	7.7	8.3
2000	7.6	7.7	7.9	8.5

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 31.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	HLR-03V
Plug Housing	HLP-03V
Retainer	HLS-03V
Pin Contact	SSM-21T-P1.4
Socket Contact	SSF-21T-P1.4

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

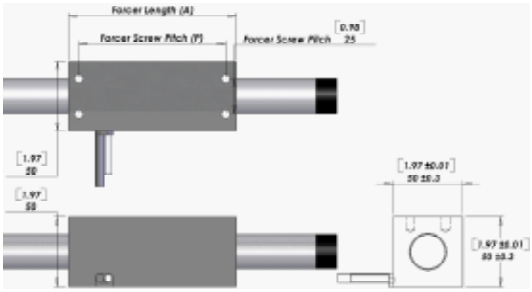
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke D/T/Q	Stroke X	Support Length	Max. Bending
0~700	0~500	50mm	0.00mm
701~1000	501~800	70mm	0.30mm
1001~1500	801~1300	70mm	0.70mm
1501~max	1301~max	100mm	0.70mm

Shaft Diameter (D) - 25mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available up to 2550mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S250T	S250X
Forcer Spacing Distance	15mm	15mm
Pole (N/S) Distance	45mm	45mm
Forcer Length	165mm	390mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D) 250 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings; X: Qctuple (8) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2000mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

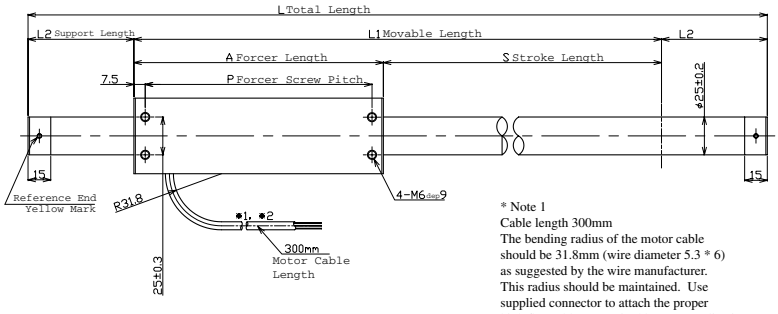
NPM Nippon Pulse
Your Partner in Motion Control

L250
Linear Shaft Motor

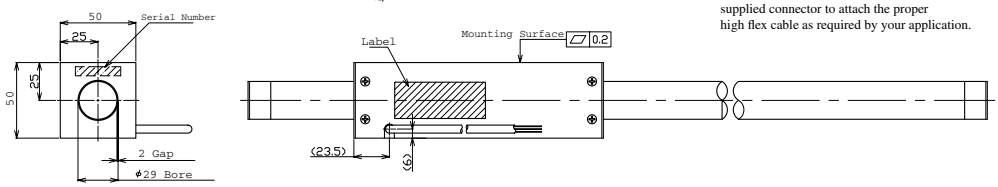
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 31.8mm (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.



Electrical Specs	L250D	L250T	L250Q
Continuous Force[1]	34N	52N	69N
Continuous Current[1]	1.3Arms	1.3Arms	1.3Arms
Peak Force[2]	138N	207N	276N
Peak Current[2]	5.2Arms	5.2Arms	5.2Arms
Force Constant (K_t)	27N/Arms	40N/Arms	53N/Arms
Back EMF (K_e)	8.8V/m/s	13V/m/s	18V/m/s
Resistance 25°C,[3]	8.4Ω	13Ω	17Ω
Inductance[3]	9.2mH	14mH	18mH
Electric Time Constant	1.11ms	1.11ms	1.11ms
Fundemental Motor Constant (K_m)	9.17N√W	11.23N√W	12.97N√W
Magnetic Pitch (North-North)	90mm	90mm	90mm

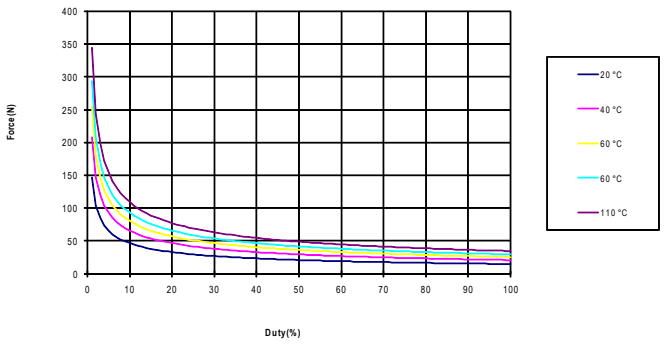
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	L250D	L250T	L250Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	7.8°C	5.2°C	3.9°C

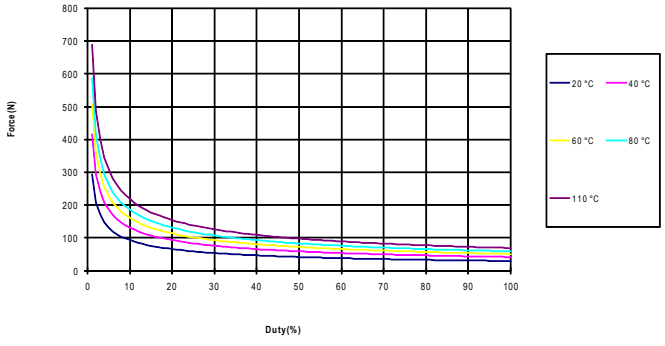
4) The standard temperature difference between the coil and the forcer surface is 20°C

Forcer Specs	L250D	L250T	L250Q
Forcer Length (A)	120mm	165mm	210mm
Forcer Width	50mm	50mm	50mm
Forcer Screw Pitch (P)	105mm	150mm	195mm
Forcer Weight	0.77kg	1.1kg	1.5kg
Gap	2.0mm	2.0mm	2.0mm

L250D Force Duty Curve



L250Q Force Duty Curve



L250
Linear Shaft Motor

Shaft Length (mm)

Stroke	S605D	S605T	S605Q
100	320	365	410
150	370	415	460
200	420	465	510
250	470	515	560
300	520	565	610
350	570	615	660
400	620	665	710
450	670	715	760
500	720	765	810
550	770	815	860
600	820	865	910
650	870	915	960
700	920	965	1010
750	1010	1055	1100
800	1060	1105	1150
850	1110	1155	1200
900	1160	1205	1250
950	1210	1255	1300
1000	1260	1305	1350
1050	1310	1355	1400
1100	1360	1405	1450
1150	1410	1455	1500
1200	1460	1505	1550
1250	1510	1555	1600
1300	1560	1605	1650
1350	1610	1655	1700
1400	1660	1705	1750
1450	1710	1755	1800
1500	1760	1805	1850
1550	1870	1915	1960
1600	1920	1965	2010
1650	1970	2015	2060
1700	2020	2065	2110
1750	2070	2115	2160
1800	2120	2165	2210
1850	2170	2215	2260
1900	2220	2265	2310
1950	2270	2315	2360
2000	2320	2365	2410

Shaft Mass (kg)

Stroke	S605D	S605T	S605Q
100	0.9	1.1	1.2
150	1.1	1.2	1.4
200	1.2	1.4	1.6
250	1.4	1.6	1.7
300	1.6	1.7	1.9
350	1.8	1.9	2.1
400	1.9	2.1	2.2
450	2.1	2.3	2.4
500	2.3	2.4	2.6
550	2.4	2.6	2.8
600	2.6	2.8	2.9
650	2.8	2.9	3.1
700	3	3.1	3.3
750	3.2	3.4	3.5
800	3.4	3.5	3.7
850	3.5	3.7	3.8
900	3.7	3.9	4
950	3.9	4	4.2
1000	4.1	4.2	4.4
1050	4.2	4.4	4.5
1100	4.4	4.6	4.7
1150	4.6	4.7	4.9
1200	4.7	4.9	5.1
1250	4.9	5.1	5.2
1300	5.1	5.2	5.4
1350	5.3	5.4	5.6
1400	5.4	5.6	5.7
1450	5.6	5.8	5.9
1500	5.8	5.9	6.1
1550	6	6.2	6.3
1600	6.2	6.3	6.5
1650	6.3	6.5	6.6
1700	6.5	6.7	6.8
1750	6.7	6.8	7
1800	6.9	7	7.2
1850	7	7.2	7.3
1900	7.2	7.4	7.5
1950	7.4	7.5	7.7
2000	7.6	7.7	7.9

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 31.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	HLR-03V
Plug Housing	HLP-03V
Retainer	HLS-03V
Pin Contact	SSM-21T-P1.4
Socket Contact	SSF-21T-P1.4

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke D/T/Q	Support Length	Max. bending
0~700	50mm	0.00mm
701~1000	70mm	0.30mm
1001~1500	70mm	0.70mm
1501~max	100mm	0.70mm

Shaft Diameter (D) - 20.5mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 3650mm. Contact Nippon Pulse for more information.

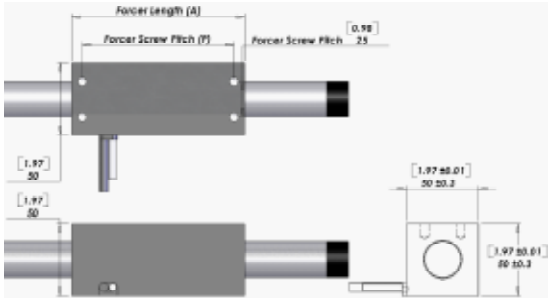
Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	L250T	L250X
Forcer Spacing Distance	15mm	15mm
Pole (N/S) Distance	45mm	45mm
Forcer Length	165mm	390mm
Flip Forcers	No	Yes

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Part Numbering System

L — Shaft Size (D): 250 — Forcer Size (A): X — Parallel Option: XX — Usable Stroke: XXXXst — Options: XX — Options: XX — Custom Options: XX

Forcer Size (A):
D: Double (2) windings
T: Triple (3) windings
Q: Quadruple (4) windings
X: Octuple (8) windings

Parallel Option:
Blank: Single Motor
PL: Parallel Motors

Usable Stroke:
100-2000mm

Options:
WP: Waterproof
HA: Digital Hall Effect

Options:
Blank: Standard
FO: Forcer Only
SO: Shaft Only

Custom Options:
Custom code

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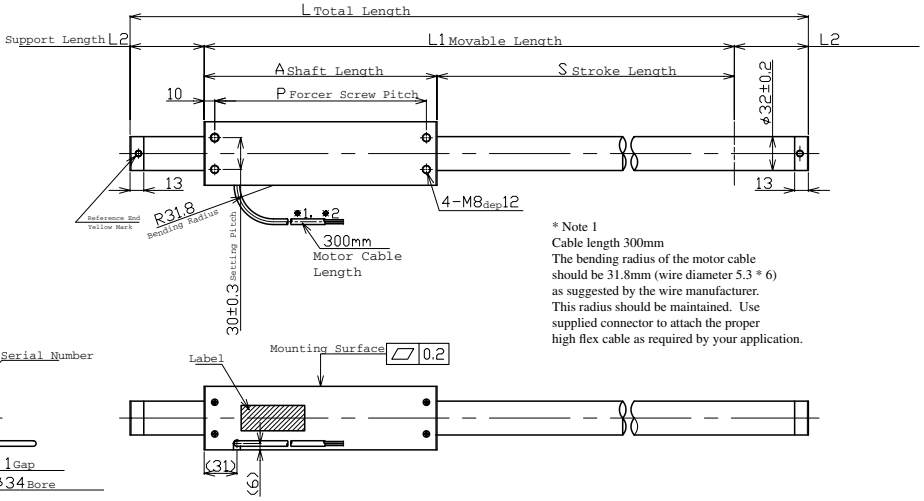
S320
Linear Shaft Motor

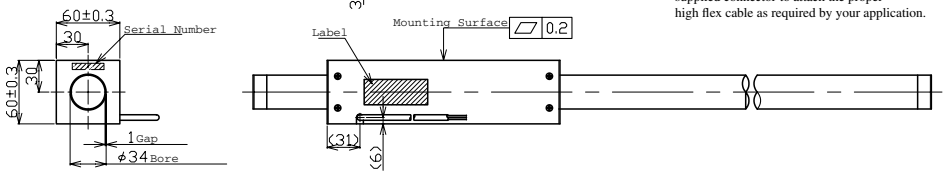
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 31.8mm (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.



Electrical Specs	S320D	S320T	S320Q	S320X
Continuous Force[1]	56N	85N	113N	226N
Continuous Current[1]	1.2Arms	1.2Arms	1.2Arms	2.5Arms
Peak Force[2]	226N	338N	451N	902N
Peak Current[2]	5.0Arms	5.0Arms	5.0Arms	9.96Arms
Force Constant (K_t)	45N/Arms	68N/Arms	91N/Arms	91N/Ar,s
Back EMF (K_e)	15V/m/s	23V/m/s	30V/m/s	30V/m/s
Resistance 25°C,[3]	11Ω	17Ω	23Ω	11.5Ω
Inductance[3]	17.0mH	26.0mH	34.0mH	17.0mH
Electric Time Constant	1.55ms	1.53ms	1.48ms	1.48ms
Fundemental Motor Constant (K_m)	13.66N√W	16.49N√W	18.89N√W	26.72N√W
Magnetic Pitch (North-North)	120mm	120mm	120mm	120mm

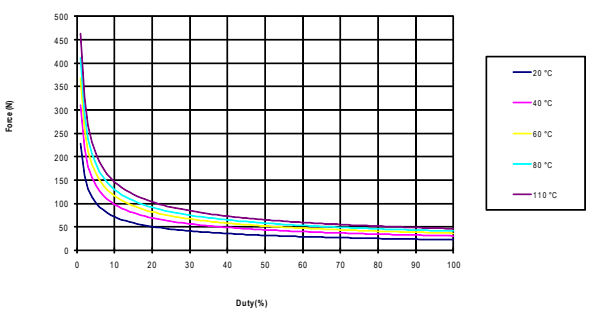
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S320D	S320T	S320Q	S320X
Max Phase Temperature[4]	135°C	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	6.7°C	4.7°C	3.6°C	1.5°C

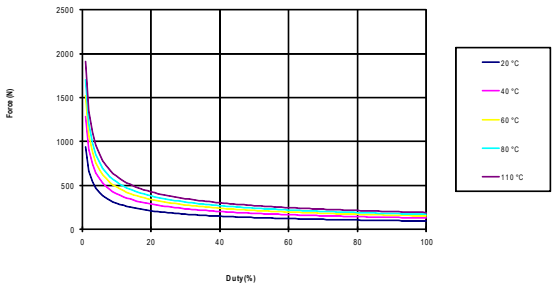
4) The standard temperature difference between the coil and the forcer surface is 25°C

Forcer Specs	S320D	S320T	S320Q	S320X
Forcer Length (A)	160mm	220mm	280mm	520mm
Forcer Width	60mm	60mm	60mm	60mm
Forcer Screw Pitch (P)	140mm	200mm	260mm	500mm
Forcer Weight	1.2kg	1.7kg	2.2kg	4.2kg
Gap	1.00mm	1.00mm	1.00mm	1.00mm

S320D Force Duty Curve



S320Q Force Duty Curve



S320
Linear Shaft Motor

Shaft Length (mm)

	S320D	S320T	S320Q	S320X
150	410	470	530	770
200	460	520	580	820
250	510	570	630	870
300	560	620	680	920
350	610	670	730	970
400	660	720	780	1020
450	710	770	830	1070
500	760	820	880	1120
550	810	870	930	1210
600	860	920	980	1260
650	910	970	1030	1310
700	960	1020	1080	1360
750	1010	1070	1130	1410
800	1100	1160	1220	1460
850	1150	1210	1270	1510
900	1200	1260	1320	1560
950	1250	1310	1370	1610
1000	1300	1360	1420	1660
1050	1350	1410	1470	1710
1100	1400	1460	1520	1760
1150	1450	1510	1570	1810
1200	1500	1560	1620	1860
1250	1550	1610	1670	1910
1300	1600	1660	1720	1960
1350	1650	1710	1770	2070
1400	1700	1760	1820	2120
1450	1750	1810	1870	2170
1500	1800	1860	1920	2220
1550	1910	1970	2030	2270
1600	2020	2080	2140	2380
1650	2130	2190	2250	2490
1700	2240	2300	2360	2600
1750	2350	2410	2470	2710
1800	2460	2520	2580	2820
1850	2570	2630	2690	2930
1900	2680	2740	2800	3040
1950	2790	2850	2910	3150
2000	2900	2960	3020	3260

Shaft Mass (kg)

Stroke	S320D	S320T	S320Q	S320X
150	2.1	2.4	2.8	4.1
200	2.4	2.7	3	4.4
250	2.7	3	3.3	4.7
300	2.9	3.3	3.6	5
350	3.2	3.6	3.9	5.2
400	3.5	3.8	4.2	5.5
450	3.8	4.1	4.5	5.8
500	4.1	4.4	4.7	6.1
550	4.3	4.7	5	6.4
600	4.6	5	5.3	6.6
650	4.9	5.2	5.6	6.9
700	5.2	5.5	5.9	7.2
750	5.5	5.8	6.1	7.5
800	5.8	6.2	6.5	7.9
850	6.1	6.5	6.8	8.2
900	6.4	6.7	7.1	8.4
950	6.7	7	7.4	8.7
1000	7	7.3	7.6	9
1050	7.3	7.6	7.9	9.3
1100	7.5	7.9	8.2	9.6
1150	7.8	8.2	8.5	9.8
1200	8.1	8.4	8.8	10.1
1250	8.4	8.7	9.1	10.4
1300	8.7	9	9.3	10.7
1350	8.9	9.3	9.6	11
1400	9.2	9.6	9.9	11.2
1450	9.5	9.8	10.2	11.5
1500	9.8	10.1	10.5	11.8
1550	10.2	10.5	10.9	12.2
1600	10.5	10.8	11.2	12.5
1650	10.8	11.1	11.5	12.8
1700	11.1	11.4	11.7	13.1
1750	11.3	11.7	12	13.4
1800	11.6	12	12.3	13.6
1850	11.9	12.2	12.6	13.9
1900	12.2	12.5	12.9	14.2
1950	12.5	12.8	13.1	14.5
2000	12.7	13.1	13.4	14.8

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 31.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	HLR-03V
Plug Housing	HLP-03V
Retainer	HLS-03V
Pin Contact	SSM-21T-P1.4
Socket Contact	SSF-21T-P1.4

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

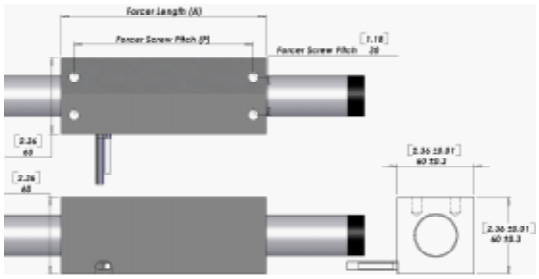
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke (D/T/Q)	X	Support Length	Max. bending
0~750	0~500	50mm	0.00mm
751~1000	501~800	70mm	0.30mm
1001~1500	801~1300	70mm	0.70mm
1501~max	1301~max.	100mm	0.70mm

Shaft Diameter (D) - 32mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 2700mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S320T	S320X
Forcer Spacing Distance	20mm	20mm
Pole (N/S) Distance	60mm	60mm
Forcer Length	220mm	520mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D) 320 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings; X: Octuple (8) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2700mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

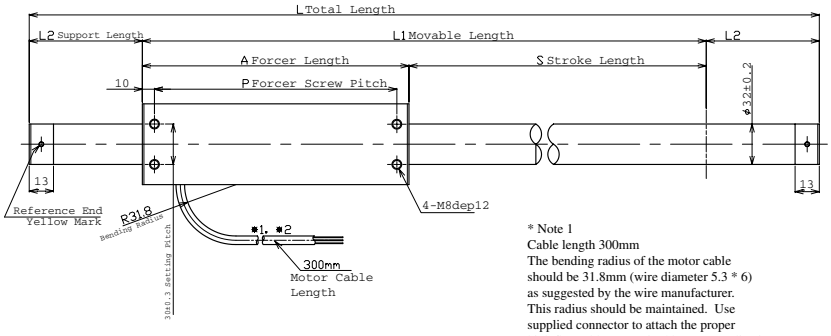
NPM Nippon Pulse
Your Partner in Motion Control

L320
Linear Shaft Motor

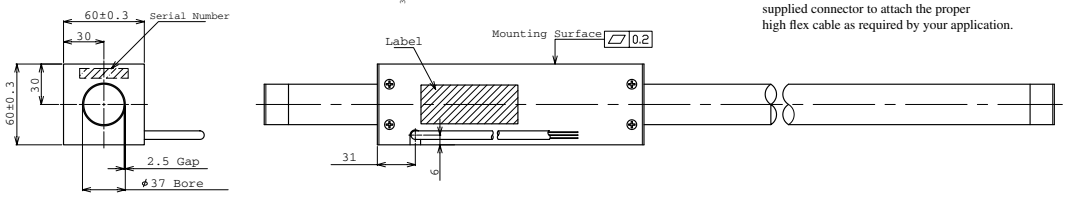
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 31.8mm (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.



Electrical Specs	L320D	L320T	L320Q
Continuous Force[1]	55N	82N	109N
Continuous Current[1]	1.3Arms	1.3Arms	1.3Arms
Peak Force[2]	218N	327N	436N
Peak Current[2]	5.0Arms	5.0Arms	5.0Arms
Force Constant (K_t)	44N/arms	65N/Arms	87N/Arms
Back EMF (K_e)	15V/m/s	22V/m/s	29V/m/s
Resistance 25°C,[3]	12Ω	17Ω	23Ω
Inductance[3]	14.0mH	21.0mH	28.0mH
Electric Time Constant	1.22ms	1.22ms	1.22ms
Fundemental Motor Constant (K_m)	12.83N√W	15.72N√W	18.15N√W
Magnetic Pitch (North-North)	120mm	120mm	120mm

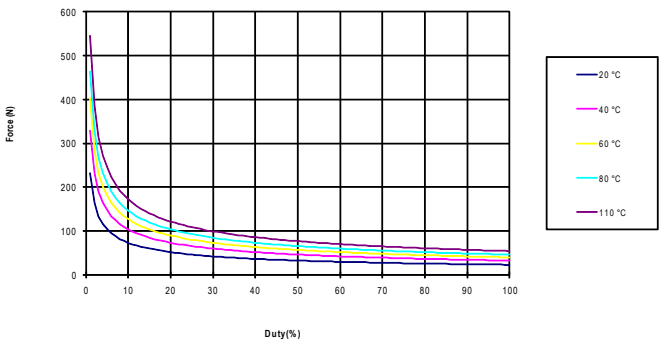
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	L320D	L320T	L320Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	6.1°C	4.1°C	3.1°C

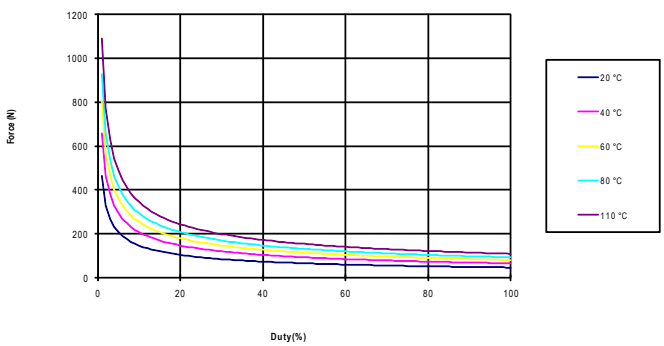
4) The standard temperature difference between the coil and the forcer surface is 25°C

Forcer Specs	L320D	L320T	L320Q
Forcer Length (A)	160mm	220mm	280mm
Forcer Width	60mm	60mm	60mm
Forcer Screw Pitch (P)	140mm	200mm	260mm
Forcer Weight	1.3kg	1.9kg	2.6kg
Gap	2.50mm	2.50mm	2.50mm

L320D Force Duty Curve



L320Q Force Duty Curve



L320
Linear Shaft Motor

Shaft Length (mm)

Stroke	L320D	L320T	L320Q
150	410	470	530
200	460	520	580
250	510	570	630
300	560	620	680
350	610	670	730
400	660	720	780
450	710	770	830
500	760	820	880
550	810	870	930
600	860	920	980
650	910	970	1030
700	960	1020	1080
750	1010	1070	1130
800	1100	1160	1220
850	1150	1210	1270
900	1200	1260	1320
950	1250	1310	1370
1000	1300	1360	1420
1050	1350	1410	1470
1100	1400	1460	1520
1150	1450	1510	1570
1200	1500	1560	1620
1250	1550	1610	1670
1300	1600	1660	1720
1350	1650	1710	1770
1400	1700	1760	1820
1450	1750	1810	1870
1500	1800	1860	1920
1550	1910	1970	2030
1600	2020	2080	2140
1650	2130	2190	2250
1700	2240	2300	2360
1750	2350	2410	2470
1800	2460	2520	2580
1850	2570	2630	2690
1900	2680	2740	2800
1950	2790	2850	2910
2000	2900	2960	3020

Shaft Mass (kg)

Stroke	L320D	L320T	L320Q
150	2.1	2.4	2.8
200	2.4	2.7	3
250	2.7	3	3.3
300	2.9	3.3	3.6
350	3.2	3.6	3.9
400	3.5	3.8	4.2
450	3.8	4.1	4.5
500	4.1	4.4	4.7
550	4.3	4.7	5
600	4.6	5	5.3
650	4.9	5.2	5.6
700	5.2	5.5	5.9
750	5.5	5.8	6.1
800	5.8	6.2	6.5
850	6.1	6.5	6.8
900	6.4	6.7	7.1
950	6.7	7	7.4
1000	7	7.3	7.6
1050	7.3	7.6	7.9
1100	7.5	7.9	8.2
1150	7.8	8.2	8.5
1200	8.1	8.4	8.8
1250	8.4	8.7	9.1
1300	8.7	9	9.3
1350	8.9	9.3	9.6
1400	9.2	9.6	9.9
1450	9.5	9.8	10.2
1500	9.8	10.1	10.5
1550	10.2	10.5	10.9
1600	10.5	10.8	11.2
1650	10.8	11.1	11.5
1700	11.1	11.4	11.7
1750	11.3	11.7	12
1800	11.6	12	12.3
1850	11.9	12.2	12.6
1900	12.2	12.5	12.9
1950	12.5	12.8	13.1
2000	12.7	13.1	13.4

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 31.8mm as suggested by the wire manufacturer.

Connector (Motor Cable)

Receptacle Housing	HLR-03V
Plug Housing	HLP-03V
Retainer	HLS-03V
Pin Contact	SSM-21T-P1.4
Socket Contact	SSF-21T-P1.4

To be installed by the user

CE Type Motor Cable

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

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

300mm lead wire blunt cut
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

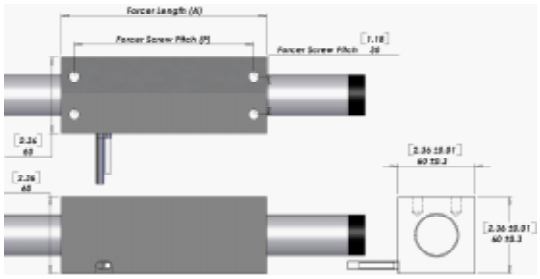
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~750	50mm	0.00mm
751~1000	70mm	0.30mm
1001~1500	70mm	0.70mm
1501~max	100mm	0.70mm

Shaft Diameter (D) - 32mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 3650mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R31.8mm (wire diameter 5.3 * 6) as suggested by the wire manufacturer. This radius should be maintained. Attach the proper high flex cable as required by your application.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	L320T	L320Q
Forcer Spacing Distance	20mm	20mm
Pole (N/S) Distance	60mm	60mm
Forcer Length	220mm	520mm
Flip Forcers	No	Yes

Part Numbering System

L — Shaft Size (D) 320 — Forcer Size (A) XX — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2000mm
- Options: WP: Waterproof; HA: Digital Hall Effect
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

NPM Nippon Pulse
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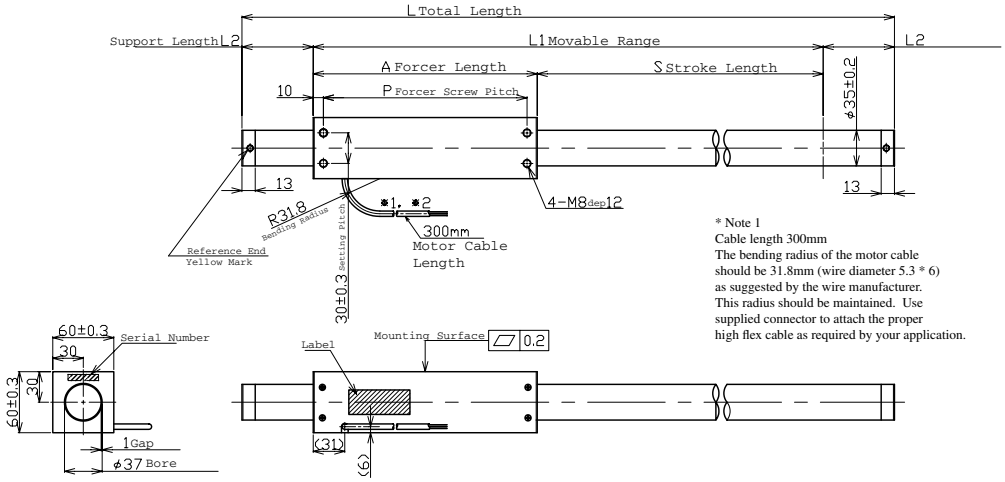
S350
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 31.8mm (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.

Electrical Specs	S350D	S350T	S350Q
Continuous Force[1]	104N	148N	190N
Continuous Current[1]	1.5Arms	1.5Arms	2.7Arms
Peak Force[2]	416N	592N	760N
Peak Current[2]	6.0Arms	6.0Arms	10.8Arms
Force Constant (K_t)	69N/Arms	99N/Arms	70N/Arms
Back EMF (K_e)	23V/m/s	33V/m/s	23V/m/s
Resistance 25°C,[3]	13.8Ω	20.2Ω	6.9Ω
Inductance[3]	21.8mH	33mH	10.9mH
Electric Time Constant	1.58ms	1.63ms	1.58ms
Fundemental Motor Constant (K_m)	18.66N√W	21.95N√W	26.79N√W
Magnetic Pitch (North-North)	120mm	120mm	120mm

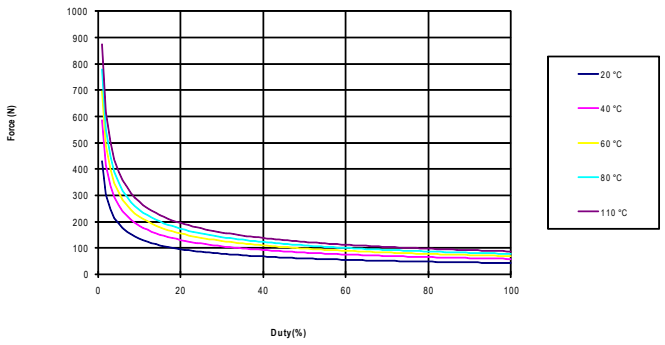
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S350D	S350T	S350Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	3.5°C	2.4°C	2.2°C

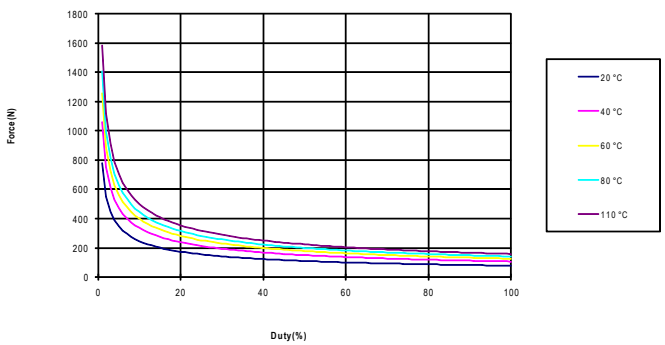
4) The standard temperature difference between the coil and the forcer surface is 25°C

Forcer Specs	S350D	S350T	S350Q
Forcer Length (A)	160mm	220mm	280mm
Forcer Width	60mm	60mm	60mm
Forcer Screw Pitch (P)	140mm	200mm	260mm
Forcer Weight	1.3kg	1.9kg	2.4kg
Gap	1.00mm	1.00mm	1.00mm

S350D Force Duty Curve



S350Q Force Duty Curve



S350
Linear Shaft Motor

Shaft Length (mm)

Stroke	S350D	S350T	S350Q
150	410	470	530
200	460	520	580
250	510	570	630
300	560	620	680
350	610	670	730
400	660	720	780
450	710	770	830
500	760	820	880
550	810	870	930
600	860	920	980
650	910	970	1030
700	960	1020	1080
750	1010	1070	1130
800	1100	1160	1220
850	1150	1210	1270
900	1200	1260	1320
950	1250	1310	1370
1000	1300	1360	1420
1050	1350	1410	1470
1100	1400	1460	1520
1150	1450	1510	1570
1200	1500	1560	1620
1250	1550	1610	1670
1300	1600	1660	1720
1350	1650	1710	1770
1400	1700	1760	1820
1450	1750	1810	1870
1500	1800	1860	1920
1550	1910	1970	2030
1600	1960	2020	2080
1650	2010	2070	2130
1700	2060	2120	2180
1750	2110	2170	2230
1800	2160	2220	2280
1850	2210	2270	2330
1900	2260	2320	2380
1950	2310	2370	2430
2000	2360	2420	2480

Shaft Mass (kg)

Stroke	S350D	S350T	S350Q
150	2.7	3.1	3.5
200	3	3.4	3.8
250	3.4	3.8	4.2
300	3.7	4.1	4.5
350	4	4.4	4.8
400	4.4	4.8	5.1
450	4.7	5.1	5.5
500	5	5.4	5.8
550	5.3	5.7	6.1
600	5.7	6.1	6.5
650	6	6.4	6.8
700	6.3	6.7	7.1
750	6.7	7.1	7.5
800	7.3	7.7	8.1
850	7.6	8	8.4
900	7.9	8.3	8.7
950	8.3	8.6	9
1000	8.6	9	9.4
1050	8.9	9.3	9.7
1100	9.2	9.6	10
1150	9.6	10	10.4
1200	9.9	10.3	10.7
1250	10.2	10.6	11
1300	10.6	11	11.4
1350	10.9	11.3	11.7
1400	11.2	11.6	12
1450	11.6	11.9	12.3
1500	11.9	12.3	12.7
1550	12.6	13	13.4
1600	12.9	13.3	13.7
1650	13.3	13.7	14.1
1700	13.6	14	14.4
1750	13.9	14.3	14.7
1800	14.3	14.7	15.1
1850	14.6	15	15.4
1900	14.9	15.3	15.7
1950	15.2	15.6	16
2000	15.6	16	16.4

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 31.8mm as suggested by the wire manufacturer.

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

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

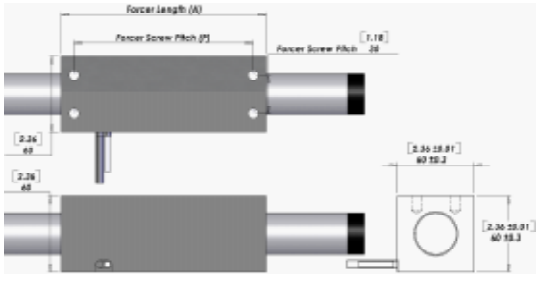
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	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.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

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

Part Numbering System

S — Shaft Size (D) 350 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2000mm
- Options: ST: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

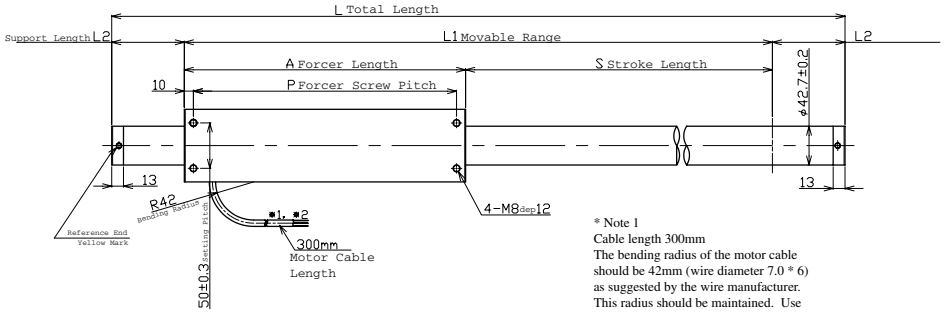
NPM Nippon Pulse
Your Partner in Motion Control

S427
Linear Shaft Motor

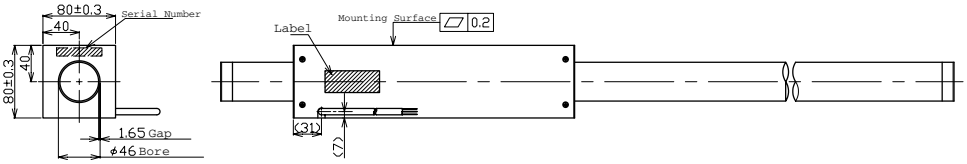
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 42mm (wire diameter 7.0 * 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.



Electrical Specs	S427D	S427T	S427Q
Continuous Force[1]	100N	150N	200N
Continuous Current[1]	3.0Arms	3.0Arms	3.0Arms
Peak Force[2]	400N	600N	800N
Peak Current[2]	12Arms	12Arms	12Arms
Force Constant (K_t)	33N/Arms	50N/Arms	67N/Arms
Back EMF (K_e)	11V/m/s	17V/m/s	22V/m/s
Resistance 25°C,[3]	2.7Ω	3.9Ω	5.2Ω
Inductance[3]	7.3mH	11mH	15mH
Electric Time Constant	2.70ms	2.82ms	2.88ms
Fundemental Motor Constant (K_m)	20.27N√W	25.52N√W	29.21N√W
Magnetic Pitch (North-North)	180mm	180mm	180mm

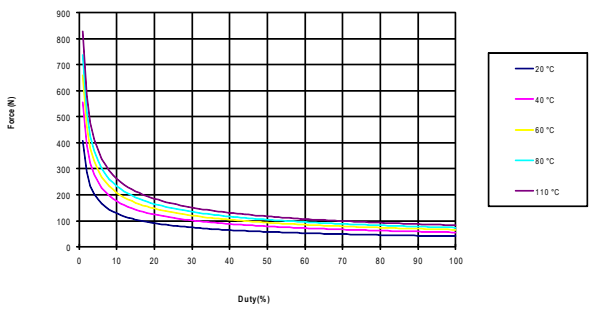
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S427D	S427T	S427Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	4.6°C	3.2°C	2.4°C

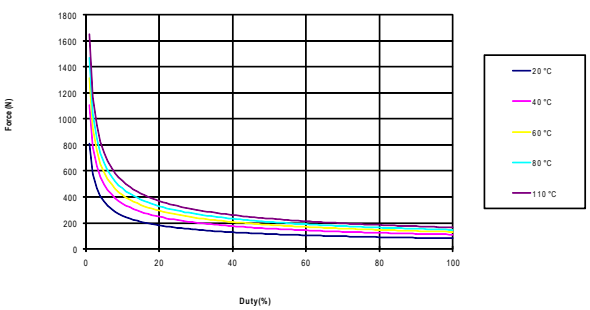
4) The standard temperature difference between the coil and the forcer surface is 25°C

Forcer Specs	S427D	S427T	S427Q
Forcer Length (A)	220mm	310mm	400mm
Forcer Width	80mm	80mm	80mm
Forcer Screw Pitch (P)	200mm	290mm	380mm
Forcer Weight	3.0kg	4.2kg	5.4kg
Gap	1.65mm	1.65mm	1.65mm

S427D Force Duty Curve



S427Q Force Duty Curve



S427
Linear Shaft Motor

Shaft Length (mm)

Stroke	S427D	S427T	S427Q
200	540	630	720
250	590	680	770
300	640	730	820
350	690	780	870
400	740	830	920
450	790	880	970
500	840	930	1020
550	890	980	1070
600	980	1070	1160
650	1030	1120	1210
700	1080	1170	1260
750	1130	1220	1310
800	1180	1270	1360
850	1230	1320	1410
900	1280	1370	1460
950	1330	1420	1510
1000	1380	1470	1560
1050	1470	1560	1650
1100	1520	1610	1700
1150	1570	1660	1750
1200	1620	1710	1800
1250	1670	1760	1850
1300	1720	1810	1900
1350	1770	1860	1950
1400	1820	1910	2000
1450	1870	1960	2050
1500	1920	2010	2100
1550	1970	2060	2150
1600	2020	2110	2200
1650	2070	2160	2250
1700	2120	2210	2300
1750	2170	2260	2350
1800	2220	2310	2400
1850	2270	2360	2450
1900	2320	2410	2500
1950	2370	2460	2550
2000	2420	2510	2600

Shaft Mass (kg)

Stroke	S427D	S427T	S427Q
200	4.9	5.8	6.7
250	5.4	6.3	7.2
300	5.9	6.8	7.7
350	6.4	7.3	8.2
400	6.9	7.8	8.7
450	7.4	8.3	9.2
500	7.9	8.8	9.7
550	8.4	9.3	10.2
600	9.1	10	10.9
650	9.6	10.5	11.4
700	10.1	11	11.9
750	10.6	11.5	12.4
800	11.1	12	12.9
850	11.6	12.5	13.4
900	12.1	13	13.9
950	12.6	13.5	14.4
1000	13.1	14	14.9
1050	13.8	14.7	15.6
1100	14.3	15.2	16.1
1150	14.8	15.7	16.6
1200	15.3	16.2	17.1
1250	15.8	16.7	17.6
1300	16.3	17.2	18.1
1350	16.8	17.7	18.6
1400	17.3	18.2	19.1
1450	17.8	18.7	19.6
1500	18.3	19.2	20.1
1550	18.8	19.7	20.6
1600	19.3	20.2	21.1
1650	19.8	20.7	21.6
1700	20.3	21.2	22.1
1750	20.8	21.7	22.6
1800	21.3	22.2	23.1
1850	21.8	22.7	23.6
1900	22.3	23.2	24.1
1950	22.8	23.7	24.6
2000	23.3	24.2	25.1

Lead Wire

Wire Type	UL 2570FA
Wire AWG	16
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 42mm as suggested by the wire manufacturer.

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

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

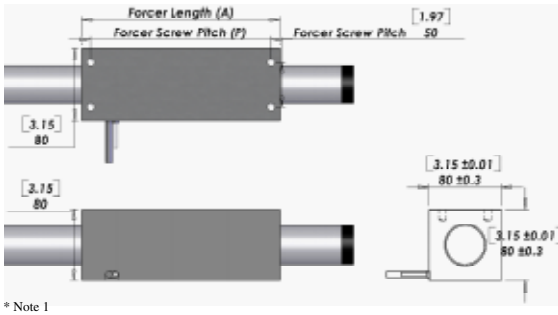
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~550	60mm	0.00mm
551~1000	80mm	0.15mm
1001~1500	100mm	0.60mm
1501~2000	100mm	1.10mm
2001~2500	100mm	2.00mm
2501~max	100mm	2.10mm

Shaft Diameter (D) - 42.7mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 4600mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S427T	S427Q
Forcer Spacing Distance	50mm	50mm
Pole (N/S) Distance	90mm	90mm
Forcer Length	310mm	400mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D): 427 — Forcer Size (A): X — Parallel Option: XX — Usable Stroke: XXXXst — Options: XX — Options: XX — Custom Options: XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 100-2000mm
- Options: ST: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

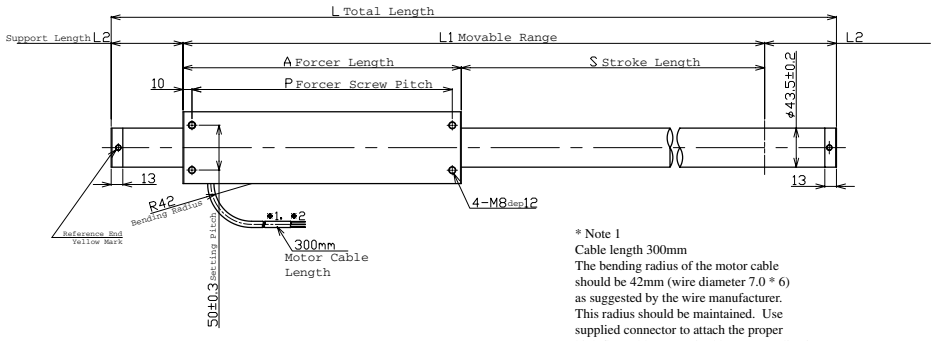
NPM Nippon Pulse
Your Partner in Motion Control

S435
Linear Shaft Motor

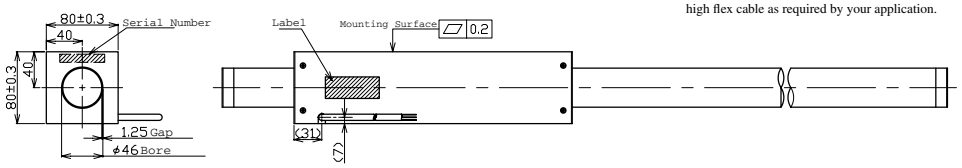
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch



* Note 1
Cable length 300mm
The bending radius of the motor cable should be 42mm (wire diameter 7.0 * 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.



Electrical Specs	S435D	S435T	S435Q
Continuous Force[1]	116N	175N	233N
Continuous Current[1]	3.0Arms	3.0Arms	3.0Arms
Peak Force[2]	464N	700N	932N
Peak Current[2]	12Arms	12Arms	12Arms
Force Constant (K_t)	39N/Arms	58N/Arms	78N/Arms
Back EMF (K_e)	13V/m/s	19V/m/s	26V/m/s
Resistance 25°C,[3]	2.7Ω	3.9Ω	5.2Ω
Inductance[3]	7.3mH	11mH	15mH
Electric Time Constant	2.70ms	2.82ms	2.88ms
Fundemental Motor Constant (K_m)	23.53N√W	29.54N√W	34.06N√W
Magnetic Pitch (North-North)	180mm	180mm	180mm

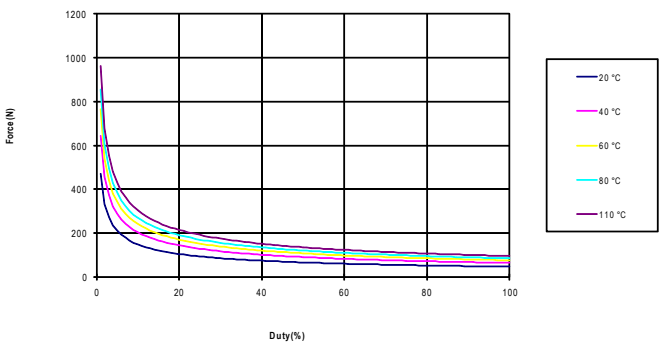
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S435D	S435T	S435Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	4.6°C	3.2°C	2.4°C

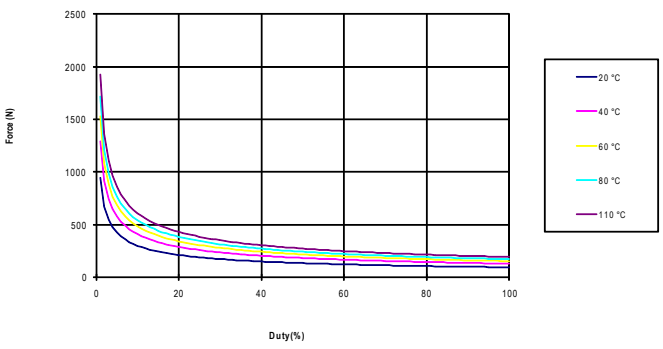
4) The standard temperature difference between the coil and the forcer surface is 30°C

Forcer Specs	S435D	S435T	S435Q
Forcer Length (A)	220mm	310mm	400mm
Forcer Width	80mm	80mm	80mm
Forcer Screw Pitch (P)	200mm	290mm	380mm
Forcer Weight	3.0kg	4.2kg	5.4kg
Gap	1.25mm	1.25mm	1.25mm

S435D Force Duty Curve



S435Q Force Duty Curve



S435
Linear Shaft Motor

Shaft Length (mm)

Stroke	S435D	S435T	S435Q
200	540	630	720
250	590	680	770
300	640	730	820
350	690	780	870
400	740	830	920
450	790	880	970
500	840	930	1020
550	890	980	1070
600	980	1070	1160
650	1030	1120	1210
700	1080	1170	1260
750	1130	1220	1310
800	1180	1270	1360
850	1230	1320	1410
900	1280	1370	1460
950	1330	1420	1510
1000	1380	1470	1560
1050	1470	1560	1650
1100	1520	1610	1700
1150	1570	1660	1750
1200	1620	1710	1800
1250	1670	1760	1850
1300	1720	1810	1900
1350	1770	1860	1950
1400	1820	1910	2000
1450	1870	1960	2050
1500	1920	2010	2100
1550	1970	2060	2150
1600	2020	2110	2200
1650	2070	2160	2250
1700	2120	2210	2300
1750	2170	2260	2350
1800	2220	2310	2400
1850	2270	2360	2450
1900	2320	2410	2500
1950	2370	2460	2550
2000	2420	2510	2600

Shaft Mass (kg)

Stroke	S435D	S435T	S435Q
200	5.1	6	7
250	5.6	6.6	7.5
300	6.1	7.1	8
350	6.7	7.6	8.5
400	7.2	8.1	9
450	7.7	8.6	9.6
500	8.2	9.2	10.1
550	8.7	9.7	10.6
600	9.4	10.4	11.3
650	10	10.9	11.8
700	10.5	11.4	12.3
750	11	11.9	12.9
800	11.5	12.5	13.4
850	12	13	13.9
900	12.6	13.5	14.4
950	13.1	14	14.9
1000	13.6	14.5	15.5
1050	14.3	15.2	16.2
1100	14.8	15.7	16.7
1150	15.3	16.3	17.2
1200	15.9	16.8	17.7
1250	16.4	17.3	18.2
1300	16.9	17.8	18.8
1350	17.4	18.4	19.3
1400	17.9	18.9	19.8
1450	18.5	19.4	20.3
1500	19	19.9	20.8
1550	19.5	20.4	21.4
1600	20	21	21.9
1650	20.5	21.5	22.4
1700	21.1	22	22.9
1750	21.6	22.5	23.4
1800	22.1	23	24
1850	22.6	23.6	24.5
1900	23.1	24.1	25
1950	23.7	24.6	25.5
2000	24.2	25.1	26

Lead Wire

Wire Type	UL 2570FA
Wire AWG	16
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 42mm as suggested by the wire manufacturer.

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

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

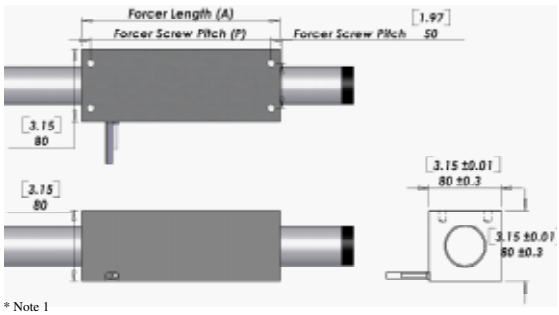
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~550	60mm	0.00mm
551~1000	80mm	0.15mm
1001~1500	100mm	0.60mm
1501~2000	100mm	1.10mm
2001~2500	100mm	2.00mm
2501~max	100mm	2.10mm

Shaft Diameter (D) - 43.5mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 2600mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S435T	S435Q
Forcer Spacing Distance	50mm	50mm
Pole (N/S) Distance	90mm	90mm
Forcer Length	310mm	400mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D): 435 — Forcer Size (A): X — Parallel Option: XX — Usable Stroke: XXXXst — Options: XX — Options: XX — Custom Options: XX

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

Parallel Option:
Blank: Single Motor
PL: Parallel Motors

Usable Stroke:
200-2000mm

Options:
Blank: Standard
WP: Waterproof
HA: Digital Hall Effect
CE: CE type motor

Options:
Blank: Standard
FO: Forcer Only
SO: Shaft Only

Custom Options:
Custom code

NPM Nippon Pulse
Your Partner in Motion Control

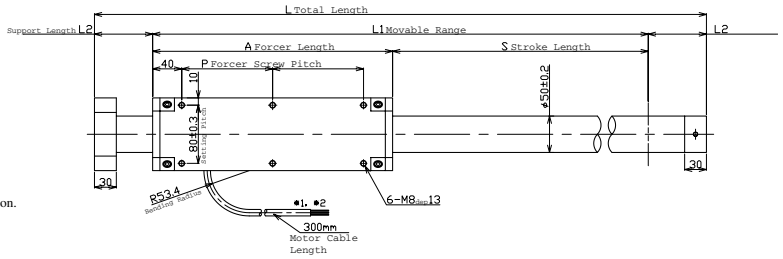
S500
Linear Shaft Motor

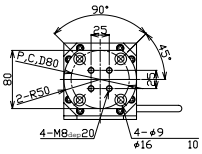
Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

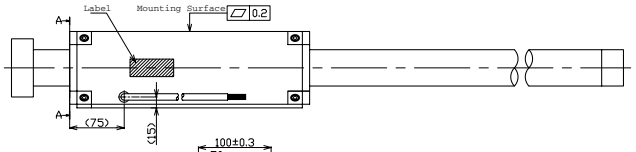
Dimension (mm)	Tolerance (mm)
- 6	±0.1
7 - 30	±0.2
31 - 120	±0.3
121 - 315	±0.5
316 - 1000	±0.8
1001 - 2000	±1.2
2000 -	±1.5

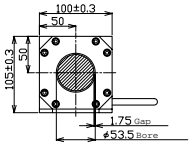
L = See Shaft Length
L1 = Usable Stroke + A
L2 = See Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch

* Note 1
Cable length 300mm
The bending radius of the motor cable should be 53.4mm (wire diameter 8.9 * 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.









Section A-A

Electrical Specs	S500D	S500T	S500Q
Continuous Force[1]	289N	440N	585N
Continuous Current[1]	3.8Arms	5.8Arms	7.7Arms
Peak Force[2]	1156N	1760N	2340N
Peak Current[2]	15.2Arms	23.2Arms	30.8Arms
Force Constant (K_f)	76N/Arms	76N/Arms	76N/Arms
Back EMF (K_e)	25V/m/s	25V/m/s	25V/m/s
Resistance 25°C,[3]	4.4Ω	3.3Ω	2.2Ω
Inductance[3]	27mH	19.8mH	13.2mH
Electric Time Constant	6.14ms	6.0ms	6.0ms
Fundemental Motor Constant (K_m)	36.28N√W	41.76N√W	51.22N√W
Magnetic Pitch (North-North)	180mm	180mm	180mm

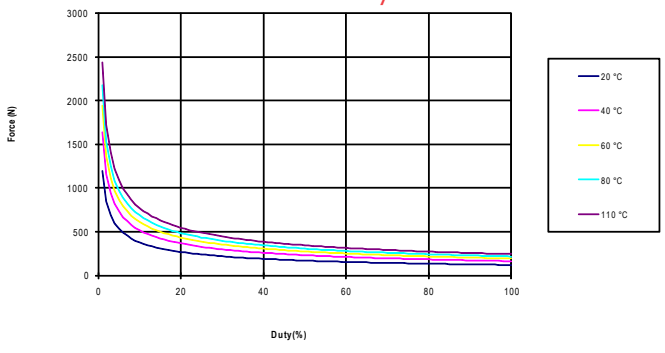
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S500D	S500T	S500Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	1.7°C	1°C	0.8°C

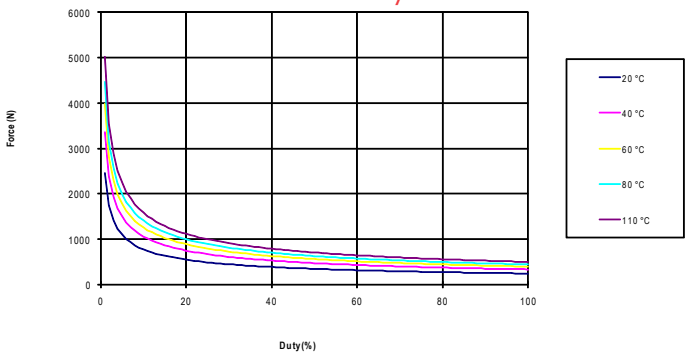
4) The standard temperature difference between the coil and the forcer surface is 40°C

Forcer Specs	S500D	S500T	S500Q
Forcer Length (A)	240mm	330mm	420mm
Forcer Width	100 x 105mm	100 x 105mm	100 x 105mm
Forcer Screw Pitch (P)	80mm	125mm	170mm
Forcer Weight	10kg	13kg	15kg
Gap	1.75mm	1.75mm	1.75mm

S500D Force Duty Curve



S500Q Force Duty Curve



S500
Linear Shaft Motor

Shaft Length (mm)

Stroke	S500D	S500T	S500Q
200	600	690	780
250	650	740	830
300	700	790	880
350	750	840	930
400	800	890	980
450	850	940	1030
500	900	990	1080
550	950	1040	1130
600	1000	1090	1180
650	1050	1140	1230
700	1100	1190	1280
750	1150	1240	1330
800	1240	1330	1420
850	1290	1380	1470
900	1340	1430	1520
950	1390	1480	1570
1000	1440	1530	1620
1050	1490	1580	1670
1100	1540	1630	1720
1150	1590	1680	1770
1200	1640	1730	1820
1250	1690	1780	1870
1300	1740	1830	1920
1350	1790	1880	1970
1400	1840	1930	2020
1450	1890	1980	2070
1500	1940	2030	2120
1550	1990	2080	2170
1600	2040	2130	2220
1650	2090	2180	2270
1700	2140	2230	2320
1750	2190	2280	2370
1800	2240	2330	2420
1850	2290	2380	2470
1900	2340	2430	2520
1950	2390	2480	2570
2000	2440	2530	2620

Shaft Mass (kg)

Stroke	S500D	S500T	S500Q
200	7.9	9.1	10.2
250	8.5	9.7	10.9
300	9.2	10.4	11.6
350	9.8	11	12.2
400	10.5	11.7	12.9
450	11.2	12.3	13.5
500	11.8	13	14.2
550	12.5	13.7	14.8
600	13.1	14.3	15.5
650	13.8	15	16.1
700	14.4	15.6	16.8
750	15.1	16.3	17.5
800	16.3	17.5	18.6
850	16.9	18.1	19.3
900	17.6	18.8	20
950	18.3	19.4	20.6
1000	18.9	20.1	21.3
1050	19.6	20.7	21.9
1100	20.2	21.4	22.6
1150	20.9	22.1	23.2
1200	21.5	22.7	23.9
1250	22.2	23.4	24.6
1300	22.8	24	25.2
1350	23.5	24.7	25.9
1400	24.2	25.3	26.5
1450	24.8	26	27.2
1500	25.5	26.7	27.8
1550	26.1	27.3	28.5
1600	26.8	28	29.1
1650	27.4	28.6	29.8
1700	28.1	29.3	30.5
1750	28.8	29.9	31.1
1800	29.4	30.6	31.8
1850	30.1	31.2	32.4
1900	30.7	31.9	33.1
1950	31.4	32.6	33.7
2000	32	33.2	34.4

Lead Wire

Wire Type	UL 2570FA
Wire AWG	14
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 53.4mm as suggested by the wire manufacturer.

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

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

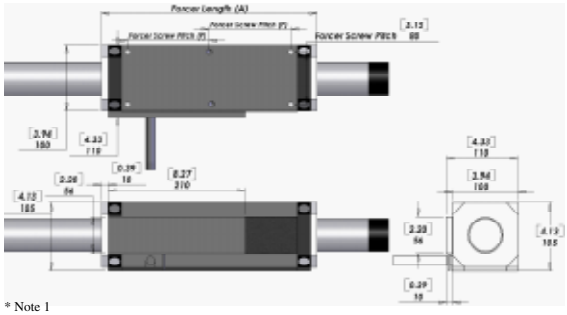
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~550	80mm	0.00mm
551~1000	80mm	0.15mm
1001~1500	100mm	0.60mm
1501~max	120mm	1.10mm

Shaft Diameter (D) - 50mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 3850mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S500T	S500Q
Forcer Spacing Distance	30mm	30mm
Pole (N/S) Distance	90mm	90mm
Forcer Length	330mm	420mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D) 500 — Forcer Size (A) X — Parallel Option XX — Usable Stroke XXXXst — Options XX — Options XX — Custom Options XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 200-2000mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect; CE: CE type motor
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code

NPM Nippon Pulse
Your Partner in Motion Control

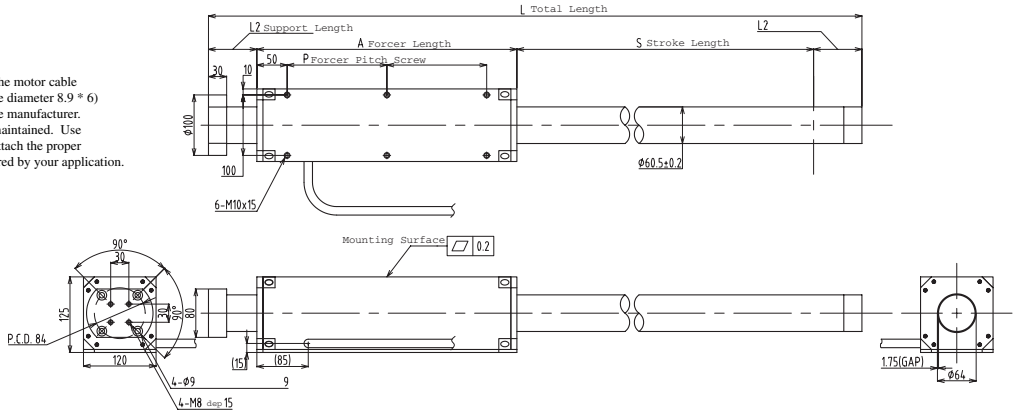
S605
Linear Shaft Motor

Unless Otherwise Specified:
Dimensions are in mm
Tolerances are as follows:

Dimension (mm)	Tolerance (mm)
- 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 Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch

* Note 1
Cable length 300mm
The bending radius of the motor cable should be 53.4mm (wire diameter 8.9 * 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.



Electrical Specs	S605D	S605T	S605Q
Continuous Force[1]	420N	610N	780N
Continuous Current[1]	8.8Arms	8.6Arms	8.4Arms
Peak Force[2]	1000N	2400N	3100N
Peak Current[2]	35Arms	34Arms	34Arms
Force Constant (K_t)	47N/arms	71N/Arms	93N/Arms
Back EMF (K_e)	16V/m/s	24V/m/s	31V/m/s
Resistance 25°C,[3]	1.1Ω	1.7Ω	2.2Ω
Inductance[3]	7mH	10mH	13mH
Electric Time Constant		5.88ms	5.91ms
Fundemental Motor Constant (K_m)		54.45N√W	62.70N√W
Magnetic Pitch (North-North)	240mm	240mm	240mm

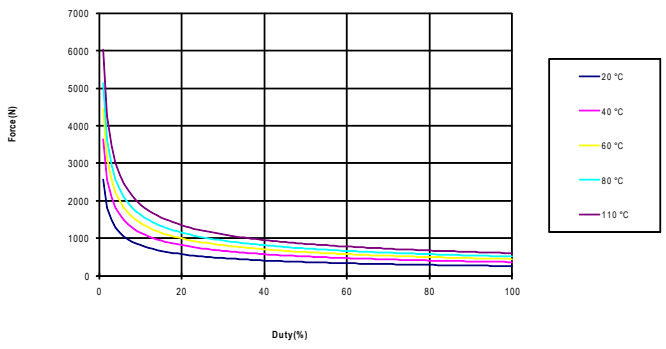
All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.
1) Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking
Addition of 25 cm x 25 cm x 2.5 cm aluminum heat sink increases continuous force by 20%
2) Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse
3) All winding parameters listed are measured line-to-line (phase-to-phase)

Thermal Specs	S605D	S605T	S605Q
Max Phase Temperature[4]	135°C	135°C	135°C
Thermal Resistance (Coil) (K_q)	1.3°C	0.9°C	0.7°C

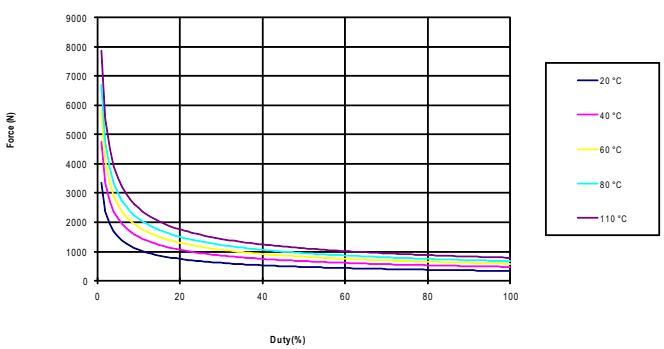
4) The standard temperature difference between the coil and the forcer surface is 40°C

Forcer Specs	S605D	S605T	S605Q
Forcer Length (A)		430mm	550mm
Forcer Width	125 x 120mm	125 x 120mm	125 x 120mm
Forcer Screw Pitch (P)	105mm	165mm	225mm
Forcer Weight	16kg	21kg	27kg
Gap	1.75mm	1.75mm	1.75mm

S605D Force Duty Curve



S605Q Force Duty Curve



S605
Linear Shaft Motor

Shaft Length (mm)

Stroke	S605T	S605Q
200	790	910
250	840	960
300	890	1010
350	940	1060
400	990	1110
450	1040	1160
500	1090	1210
550	1140	1260
600	1190	1310
650	1240	1360
700	1290	1410
750	1340	1460
800	1430	1550
850	1480	1600
900	1530	1650
950	1580	1700
1000	1630	1750
1050	1680	1800
1100	1730	1850
1150	1780	1900
1200	1830	1950
1250	1880	2000
1300	1930	2050
1350	1980	2100
1400	2030	2150
1450	2080	2200
1500	2130	2250
1550	2180	2300
1600	2230	2350
1650	2280	2400
1700	2330	2450
1750	2380	2500
1800	2430	2550
1850	2480	2600
1900	2530	2650
1950	2580	2700
2000	2630	2750

Shaft Mass (kg)

Stroke	S605T	S605Q
200	14.9	17.3
250	15.9	18.3
300	16.9	19.3
350	17.9	20.3
400	18.9	21.3
450	19.9	22.3
500	20.9	23.4
550	21.9	24.4
600	23	25.4
650	24	26.4
700	25	27.4
750	26	28.4
800	27	29.4
850	28	30.4
900	29	31.4
950	30	32.4
1000	31	33.4
1050	32	34.4
1100	33	35.4
1150	34	36.4
1200	35	37.4
1250	36	38.4
1300	37	39.5
1350	38	40.5
1400	39.1	41.5
1450	40.1	42.5
1500	41.1	43.5
1550	42.1	44.5
1600	43.1	45.5
1650	44.1	46.5
1700	45.1	47.5
1750	46.1	48.5
1800	47.1	49.5
1850	48.1	50.5
1900	49.1	51.5
1950	50.1	52.5
2000	51.1	53.5

Lead Wire

Wire Type	UL 2570FA
Wire AWG	14
U Phase	Red
V Phase	White
W Phase	Black

300mm lead wire bare leads
The bending radius of the motor cable should be 53.4mm as suggested by the wire manufacturer.

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

CE Type Motor Cable

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

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

300mm lead wire bare leads
The bending radius of the motor cable should be 16.96mm as suggested by the wire manufacturer.

Hall Effect Cable

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
No Connec.	Gray/Black

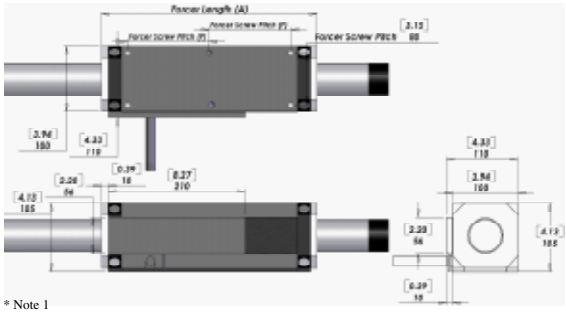
400mm lead wire bare leads
The bending radius of the motor cable should be 27.6mm as suggested by the wire manufacturer.

Support and Bending

Stroke	Support Length	Max. bending
0~550	80mm	0.00mm
551~750	80mm	0.15mm
751~1500	100mm	0.60mm
1501~max	120mm	1.10mm

Shaft Diameter (D) - 60.5mm ±0.2
Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)
Stroke lengths available from 100mm to 3000mm. Contact Nippon Pulse for more information.

Hall Effect Specs



* Note 1
The bending radius of the motor cable should be R27.6mm (wire diameter 4.6 * 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.

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 R36.6mm (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.

Tandem Forcer

Forcer Spacing Distance

Forcer Spacing Distance

Spec	S605T	S605Q
Forcer Spacing Distance	30mm	30mm
Pole (N/S) Distance	90mm	90mm
Forcer Length	330mm	420mm
Flip Forcers	No	Yes

Part Numbering System

S — Shaft Size (D): 605 — Forcer Size (A): X — Parallel Option: XX — Usable Stroke: XXXXst — Options: XX — Options: XX — Custom Options: XX

- Forcer Size (A): D: Double (2) windings; T: Triple (3) windings; Q: Quadruple (4) windings
- Parallel Option: Blank: Single Motor; PL: Parallel Motors
- Usable Stroke: 200-2000mm
- Options: Blank: Standard; WP: Waterproof; HA: Digital Hall Effect
- Options: Blank: Standard; FO: Forcer Only; SO: Shaft Only
- Custom Options: Custom code