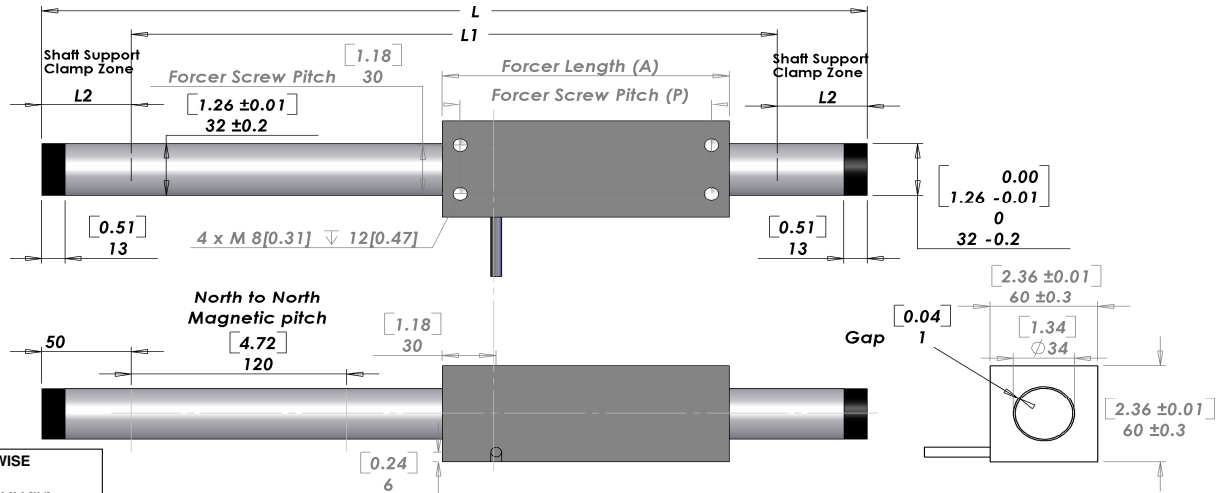


NPM S320



UNLESS OTHERWISE SPECIFIED:
Dimensions are in MM [IN]
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

* Note 1
Cable length 300mm
The bending radius of the motor cable should be 36.6 mm (wire diameter 6.1 * 6) as suggested by the wire manufacturer. This radius should be maintained. Use supplied connector to attach the proper high flex cable as required by your application.

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

Electrical Specifications

	S320D	S320T	S320Q	S320X
Continuous Force ¹	56N (12.6lbs)	85N (19.1lbs)	113N (25.4lbs)	226N (50.8lbs)
Continuous Current ¹	1.2Arms	1.2Arms	1.2Arms	2.5Arms
Peak Force ²	226N (50.8lbs)	338N (76.0lbs)	451N (102lbs)	902N (203lbs)
Peak Current ²	5.0Arms	5.0Arms	5.0Arms	9.96Arms
Force Constant K_f	45N/Arms (10.12lbs/Arms)	68N/Arms (15.29lbs/Arms)	91N/Arms (20.37lbs/Arms)	91N/Arms (20.37lbs/Arms)
Back EMF K_e	15V/m/s (0.38 V/in/s)	23V/m/s (0.58 V/in/s)	30V/m/s (0.77 V/in/s)	30V/m/s (0.77 V/in/s)
Resistance 25 °C, ³	11Ω	17Ω	23Ω	11.5Ω
Inductance ³	17.0mH	26.0mH	34.0mH	17.0mH
Electrical Time Constant	1.55ms	1.53ms	1.48ms	1.48ms
Fundamental Motor Constant K_m	13.66N√w	16.49N√w	18.89N√w	26.72N√w
Magnetic Pitch (North-North)	120mm (4.72in)	120mm (4.72in)	120mm (4.72in)	120mm (4.72in)

All specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse America.

- 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%.
- Can be maintained for a maximum of 40 seconds, higher forces and current possible for short periods of time, consult Nippon Pulse America.
- All winding parameters listed are measured line-to-line (phase-to-phase).

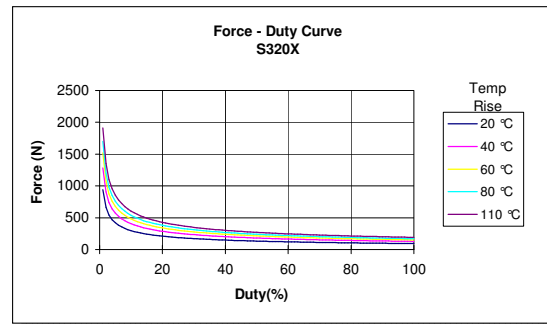
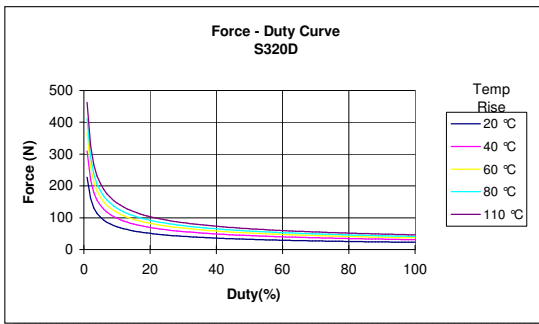
Thermal Specifications

	S320D	S320T	S320Q	S320X
Max phase temperature ⁴	135 °C (275 °F)	135 °C (275 °F)	135 °C (275 °F)	135 °C (275 °F)
Thermal Resistance (Coil) K_c	6.7 °C/W	4.7 °C/W	3.6 °C/W	1.5 °C/W

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

Mechanical Specifications

Forcer		S320D	S320T	S320Q	S320X
Forcer Length	A	160mm (6.3in)	220mm (8.6in)	280mm (11in)	520mm (20.5in)
Forcer Width		60mm (2.36in)	60mm (2.36in)	60mm (2.36in)	60mm (2.36in)
Forcer Screw Pitch	P	140mm (5.51in)	200mm (7.87in)	260mm (10.24in)	500mm (19.69in)
Forcer Weight		1.2kg (2.6lbs)	1.7kg (3.7lbs)	2.2kg (4.9lbs)	4.2kg (9.3lbs)
Gap		1.00mm (0.039in)	1.00mm (0.039in)	1.00mm (0.039in)	1.00mm (0.039in)



Mechanical Specifications

Shaft

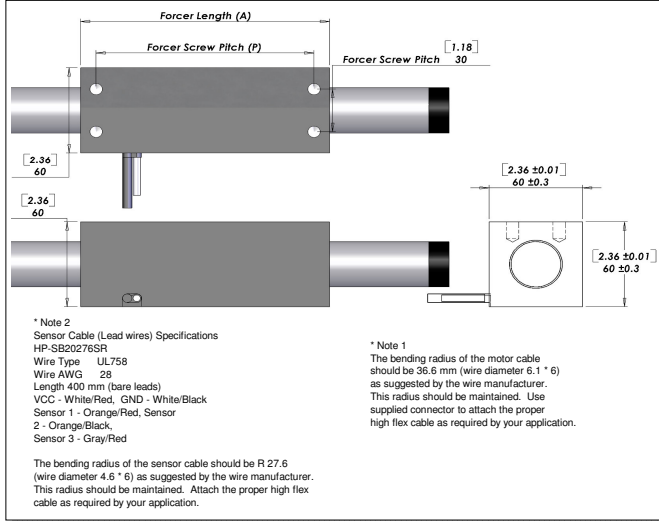
Shaft Diameter (D) 32 ±0.2mm (1.26in)

Shaft Length (L) Motor Type	Maximum Stroke length 2700mm (106.3in)			
	S320D	S320T	S320Q	S320X
150	410mm (16.1in)	470mm (18.5in)	530mm (20.9in)	770mm (30.3in)
200	460mm (18.1in)	520mm (20.5in)	580mm (22.8in)	820mm (32.3in)
250	510mm (20.1in)	570mm (22.4in)	630mm (24.8in)	870mm (34.3in)
300	560mm (22in)	620mm (24.4in)	680mm (26.8in)	920mm (36.2in)
350	610mm (24in)	670mm (26.4in)	730mm (28.7in)	970mm (38.2in)
400	660mm (26in)	720mm (28.3in)	780mm (30.7in)	1020mm (40.2in)
450	710mm (28in)	770mm (30.3in)	830mm (32.7in)	1070mm (42.1in)
500	760mm (29.9in)	820mm (32.3in)	880mm (34.6in)	1120mm (44.1in)
550	810mm (31.9in)	870mm (34.3in)	930mm (36.6in)	1210mm (47.6in)
600	860mm (33.9in)	920mm (36.2in)	980mm (38.6in)	1260mm (49.6in)
650	910mm (35.8in)	970mm (38.2in)	1030mm (40.6in)	1310mm (51.6in)
700	960mm (37.8in)	1020mm (40.2in)	1080mm (42.5in)	1360mm (53.5in)
750	1010mm (39.8in)	1070mm (42.1in)	1130mm (44.5in)	1410mm (55.5in)
800	1100mm (43.3in)	1160mm (45.7in)	1220mm (48in)	1460mm (57.5in)
850	1150mm (45.3in)	1210mm (47.6in)	1270mm (50in)	1510mm (59.4in)
900	1200mm (47.2in)	1260mm (49.6in)	1320mm (52in)	1560mm (61.4in)
950	1250mm (49.2in)	1310mm (51.6in)	1370mm (53.9in)	1610mm (63.4in)
1000	1300mm (51.2in)	1360mm (53.5in)	1420mm (55.9in)	1660mm (65.4in)
1050	1350mm (53.1in)	1410mm (55.5in)	1470mm (57.9in)	1710mm (67.3in)
1100	1400mm (55.1in)	1460mm (57.5in)	1520mm (59.8in)	1760mm (69.3in)
1150	1450mm (57.1in)	1510mm (59.4in)	1570mm (61.8in)	1810mm (71.3in)
1200	1500mm (59.1in)	1560mm (61.4in)	1620mm (63.8in)	1860mm (73.2in)
1250	1550mm (61in)	1610mm (63.4in)	1670mm (65.7in)	1910mm (75.2in)
1300	1600mm (63in)	1660mm (65.4in)	1720mm (67.7in)	1960mm (77.2in)
1350	1650mm (65in)	1710mm (67.3in)	1770mm (69.7in)	2070mm (81.5in)
1400	1700mm (66.9in)	1760mm (69.3in)	1820mm (71.7in)	2120mm (83.5in)
1450	1750mm (68.9in)	1810mm (71.3in)	1870mm (73.6in)	2170mm (85.4in)
1500	1800mm (70.9in)	1860mm (73.2in)	1920mm (75.6in)	2220mm (87.4in)
1550	1910mm (75.2in)	1970mm (77.6in)	2030mm (79.9in)	2270mm (89.4in)
1600	2020mm (79.5in)	2080mm (81.9in)	2140mm (84.3in)	2380mm (93.7in)
1650	2130mm (83.9in)	2190mm (86.2in)	2250mm (88.6in)	2490mm (98in)
1700	2240mm (88.2in)	2300mm (90.6in)	2360mm (92.9in)	2600mm (102.4in)
1750	2350mm (92.5in)	2410mm (94.9in)	2470mm (97.2in)	2710mm (106.7in)
1800	2460mm (96.9in)	2520mm (99.2in)	2580mm (101.6in)	2820mm (111in)
1850	2570mm (101.2in)	2630mm (103.5in)	2690mm (105.9in)	2930mm (115.4in)
1900	2680mm (105.5in)	2740mm (107.9in)	2800mm (110.2in)	3040mm (119.7in)
1950	2790mm (109.8in)	2850mm (112.2in)	2910mm (114.6in)	3150mm (124in)
2000	2900mm (114.2in)	2960mm (116.5in)	3020mm (118.9in)	3260mm (128.3in)

Stroke lengths from 100mm and up to 2700mm are available. Please consult Nippon Pulse America for more information.

Stroke D / T / Q	X	Shaft Support length (L2)	Max Bending
0 → 750	0 → 500	50mm (1.97in)	0.00mm (0.00in)
751 → 1000	501 → 800	70mm (2.76in)	0.30mm (0.012in)
1001 → 1500	801 → 1300	70mm (2.76in)	0.70mm (0.028in)
1501 → Max	1301 → Max	100mm (3.94in)	0.70mm (0.028in)

Hall Effect (Optional)



How to Order (Available Options)

Motor Type	Forcer Size	Usable Stroke	Options	Options
S320	X	XX	XX	XX
Linear Shaft Motor	D	Double (2) windings	ST	(Blank)
	T	Triple (3) windings	WP	Standard
	Q	Quadruple (4) windings	HA	FO Forcer Only
	X	Octuple (8) windings	CE	SO Shaft Only
				XX Two digit for custom motor

Shaft Mass

Motor Type	S320D	S320T	S320Q	S320X
150	2.1kg (4.6lb)	2.4kg (5.4lb)	2.8kg (6.1lb)	4.1kg (9.1lb)
200	2.4kg (5.2lb)	2.7kg (6lb)	3kg (6.7lb)	4.4kg (9.7lb)
250	2.7kg (5.8lb)	3kg (6.6lb)	3.3kg (7.3lb)	4.7kg (10.3lb)
300	2.9kg (6.5lb)	3.3kg (7.2lb)	3.6kg (8lb)	5kg (10.9lb)
350	3.2kg (7.1lb)	3.6kg (7.8lb)	3.9kg (8.6lb)	5.2kg (11.6lb)
400	3.5kg (7.7lb)	3.8kg (8.5lb)	4.2kg (9.2lb)	5.5kg (12.2lb)
450	3.8kg (8.3lb)	4.1kg (9.1lb)	4.5kg (9.8lb)	5.8kg (12.8lb)
500	4.1kg (8.9lb)	4.4kg (9.7lb)	4.7kg (10.4lb)	6.1kg (13.4lb)
550	4.3kg (9.6lb)	4.7kg (10.3lb)	5kg (11.1lb)	6.4kg (14lb)
600	4.6kg (10.2lb)	5kg (10.9lb)	5.3kg (11.7lb)	6.6kg (14.7lb)
650	4.9kg (10.8lb)	5.2kg (11.6lb)	5.6kg (12.3lb)	6.9kg (15.3lb)
700	5.2kg (11.4lb)	5.5kg (12.2lb)	5.9kg (12.9lb)	7.2kg (15.9lb)
750	5.5kg (12.1lb)	5.8kg (12.8lb)	6.1kg (13.5lb)	7.5kg (16.5lb)
800	5.8kg (12.9lb)	6.2kg (13.6lb)	6.5kg (14.4lb)	7.9kg (17.4lb)
850	6.1kg (13.5lb)	6.5kg (14.3lb)	6.8kg (15lb)	8.2kg (18lb)
900	6.4kg (14.1lb)	6.7kg (14.9lb)	7.1kg (15.6lb)	8.4kg (18.6lb)
950	6.7kg (14.7lb)	7kg (15.5lb)	7.4kg (16.2lb)	8.7kg (19.2lb)
1000	7kg (15.4lb)	7.3kg (16.1lb)	7.6kg (16.9lb)	9kg (19.8lb)
1050	7.3kg (16lb)	7.6kg (16.7lb)	7.9kg (17.5lb)	9.3kg (20.5lb)
1100	7.5kg (16.6lb)	7.9kg (17.4lb)	8.2kg (18.1lb)	9.6kg (21.1lb)
1150	7.8kg (17.2lb)	8.2kg (18lb)	8.5kg (18.7lb)	9.8kg (21.7lb)
1200	8.1kg (17.9lb)	8.4kg (18.6lb)	8.8kg (19.3lb)	10.1kg (22.3lb)
1250	8.4kg (18.5lb)	8.7kg (19.2lb)	9.1kg (20lb)	10.4kg (22.9lb)
1300	8.7kg (19.1lb)	9kg (19.8lb)	9.3kg (20.6lb)	10.7kg (23.6lb)
1350	8.9kg (19.7lb)	9.3kg (20.5lb)	9.6kg (21.2lb)	11kg (24.2lb)
1400	9.2kg (20.3lb)	9.6kg (21.1lb)	9.9kg (21.8lb)	11.2kg (24.8lb)
1450	9.5kg (21lb)	9.8kg (21.7lb)	10.2kg (22.4lb)	11.5kg (25.4lb)
1500	9.8kg (21.6lb)	10.1kg (22.3lb)	10.5kg (23.1lb)	11.8kg (26lb)
1550	10.2kg (22.5lb)	10.5kg (23.1lb)	10.9kg (24lb)	12.2kg (27lb)
1600	10.5kg (23.1lb)	10.8kg (23.9lb)	11.2kg (24.6lb)	12.5kg (27.6lb)
1650	10.8kg (23.8lb)	11.1kg (24.5lb)	11.5kg (25.2lb)	12.8kg (28.2lb)
1700	11.1kg (24.4lb)	11.4kg (25.1lb)	11.7kg (25.9lb)	13.1kg (28.8lb)
1750	11.3kg (25lb)	11.7kg (25.7lb)	12kg (26.5lb)	13.4kg (29.5lb)
1800	11.6kg (25.6lb)	12kg (26.4lb)	12.3kg (27.1lb)	13.6kg (30.1lb)
1850	11.9kg (26.2lb)	12.2kg (27lb)	12.6kg (27.7lb)	13.9kg (30.7lb)
1900	12.2kg (26.9lb)	12.5kg (27.6lb)	12.9kg (28.3lb)	14.2kg (31.3lb)
1950	12.5kg (27.5lb)	12.8kg (28.2lb)	13.1kg (29lb)	14.5kg (31.9lb)
2000	12.7kg (28.1lb)	13.1kg (28.8lb)	13.4kg (29.6lb)	14.8kg (32.6lb)

Lead Wire

Motor Cable	UL 2464
Wire Type	UL 2464
Wire AWG	20
U phase	White
V phase	Black
W phase	Green / Yellow
300mm lead wire bare leads	
The bending radius of the motor cable should be 36.6mm as suggested by the wire manufacturer.	
Supplied 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)	

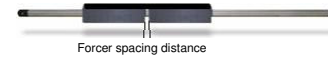
CE Type Motor Cable (Optional)

Wire Type	UL 1330
Wire AWG	24
U phase	Red
V phase	White
W phase	Black
Ground Cable	
Wire Type	UL 1330
Wire AWG	20
FG (Frame Ground)	Green / Yellow
300mm lead wire blunt cut	
The bending radius of the motor cable should be 16.96mm or more as suggested by the wire manufacturer.	

Hall Effect Cable (Optional)

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 hall effect cable should be 27.6mm as suggested by the wire manufacturer.	
Connector (Hall Effect Cable)	
None supplied	

Tandem Forcer



	S320T	S320X
Forcer spacing distance	20	20
Pole (North-South) distance	60	60
Forcer length	220	520
Flip forcers	No	Yes