

Electrical Specifications

	S120D	S120T	S120Q
Continuous Force ¹	4.5N (1.01lbs)	6.6N (1.48lbs)	8.9N (2.00lbs)
Continuous Current ¹	0.4Arms	0.4Arms	0.4Arms
Peak Force ²	18N (4.0lbs)	27N (6.0lbs)	36N (8.0lbs)
Peak Current ²	1.6Arms	1.6Arms	1.6Arms
Force Constant K_f	11N/Arms (2.5lbs/Arms)	17N/Arms (3.7lbs/Arms)	22N/Arms (5.0lbs/Arms)
Back EMF K_e	3.7V/m/s (0.09 V/in/s)	5.5V/m/s (0.14 V/in/s)	7.4V/m/s (0.19 V/in/s)
Resistance 25°C, ³	37Ω	54Ω	73Ω
Inductance ³	12mH	18mH	24mH
Electrical Time Constant	0.32ms	0.33ms	0.33ms
Fundamental Motor Constant K_m	1.82N√w	2.25N√w	2.60N√w
Magnetic Pitch (North-North)	48mm (1.89in)	48mm (1.89in)	48mm (1.89in)

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).

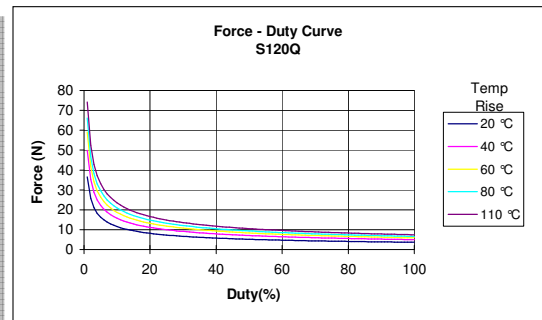
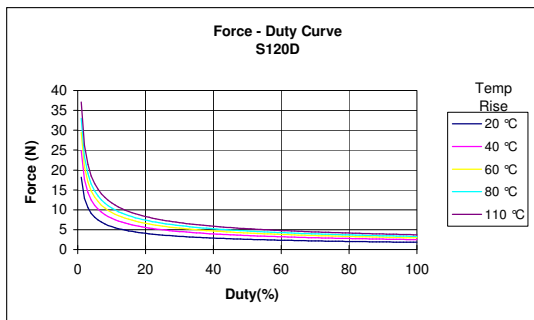
Thermal Specifications

	S120D	S120T	S120Q
Max phase temperature ⁴	135°C (275°F)	135°C (275°F)	135°C (275°F)
Thermal Resistance (Coil) K_{θ}	18.6°C/W	12.7°C/W	9.4°C/W

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

Mechanical Specifications

Forcer		S120D	S120T	S120Q
Forcer Length	A	64mm (2.52in)	88mm (3.46in)	112mm (4.41in)
Forcer Width		25mm (0.98in)	25mm (0.98in)	25mm (0.98in)
Forcer Screw Pitch	P	56mm (2.2in)	80mm (3.15in)	104mm (4.1in)
Forcer Weight		0.09kg (0.20lb)	0.12kg (0.26lb)	0.16kg (0.35lb)
Gap		0.50mm (0.019in)	0.50mm (0.019in)	0.50mm (0.019in)



Mechanical Specifications

Shaft

Shaft Diameter (D) 12 ±0.2mm (0.16in)

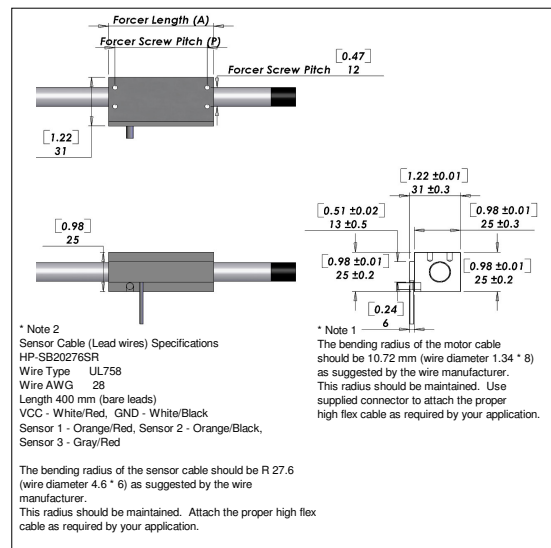
Shaft Length (L) Motor Type	Maximum Stroke length 1800mm (70.8in)		
	S120D	S120T	S120Q
50	164mm (6.5in)	188mm (7.4in)	212mm (8.3in)
100	214mm (8.4in)	238mm (9.4in)	262mm (10.3in)
150	264mm (10.4in)	288mm (11.3in)	312mm (12.3in)
200	314mm (12.4in)	338mm (13.3in)	362mm (14.3in)
250	364mm (14.3in)	388mm (15.3in)	412mm (16.2in)
300	414mm (16.3in)	438mm (17.2in)	462mm (18.2in)
350	464mm (18.3in)	488mm (19.2in)	512mm (20.2in)
400	514mm (20.3in)	538mm (21.2in)	562mm (22.1in)
450	564mm (22.3in)	588mm (23.2in)	612mm (24.1in)
500	614mm (24.3in)	638mm (25.2in)	662mm (26.1in)
550	664mm (26.3in)	688mm (27.2in)	712mm (28.1in)
600	714mm (28.3in)	738mm (29.2in)	762mm (30.1in)
650	764mm (30.3in)	788mm (31.2in)	812mm (32.1in)
700	814mm (32.3in)	838mm (33.2in)	862mm (34.1in)
750	864mm (34.3in)	888mm (35.2in)	912mm (36.1in)
800	914mm (36.3in)	938mm (37.2in)	962mm (38.1in)
850	964mm (38.3in)	988mm (39.2in)	1012mm (40.1in)
900	1014mm (40.3in)	1038mm (41.2in)	1062mm (42.1in)
950	1064mm (42.3in)	1088mm (43.2in)	1112mm (44.1in)
1000	1114mm (44.3in)	1138mm (45.2in)	1162mm (46.1in)
1050	1164mm (46.3in)	1188mm (47.2in)	1212mm (48.1in)
1100	1214mm (48.3in)	1238mm (49.2in)	1262mm (50.1in)
1150	1264mm (50.3in)	1288mm (51.2in)	1312mm (52.1in)
1200	1314mm (52.3in)	1338mm (53.2in)	1362mm (54.1in)
1250	1364mm (54.3in)	1388mm (55.2in)	1412mm (56.1in)
1300	1414mm (56.3in)	1438mm (57.2in)	1462mm (58.1in)
1350	1464mm (58.3in)	1488mm (59.2in)	1512mm (60.1in)
1400	1514mm (60.3in)	1538mm (61.2in)	1562mm (62.1in)
1450	1564mm (62.3in)	1588mm (63.2in)	1612mm (64.1in)
1500	1614mm (64.3in)	1638mm (65.2in)	1662mm (66.1in)
1550	1664mm (66.3in)	1688mm (67.2in)	1712mm (68.1in)

Stroke lengths up to 1800mm available. Please consult Nippon Pulse America for more information.

Support and Bending

Stroke	Shaft Support length (L2)	Max Bending
0 → 350	25mm (0.98in)	0.00mm (0.00in)
351 → 800	40mm (1.57in)	0.30mm (0.012in)
801 → Max	60mm (2.36in)	0.50mm (0.019in)

Hall Effect (Optional)



How to Order (Available Options)

Motor Type	Forcer Size	Usable Stroke	Options	Options	Standard
S120	X	XX	XX	XX	Standard
Linear Shaft Motor	D	50 - 1750 mm		(Blank)	Forcer Only
	T			FO	Shaft Only
	Q			SO	Two digit for custom motor
				XX	
			ST		Standard
			WP		Waterproof
			HA		Digital Hall Effect
			CE		CE type motor

Shaft Mass

Stroke	Motor Type		
	S120D	S120T	S120Q
50	0.1kg (0.2lb)	0.1kg (0.3lb)	0.1kg (0.3lb)
100	0.1kg (0.3lb)	0.2kg (0.4lb)	0.2kg (0.4lb)
150	0.2kg (0.4lb)	0.2kg (0.5lb)	0.2kg (0.5lb)
200	0.2kg (0.5lb)	0.2kg (0.5lb)	0.3kg (0.6lb)
250	0.3kg (0.6lb)	0.3kg (0.6lb)	0.3kg (0.7lb)
300	0.3kg (0.7lb)	0.3kg (0.7lb)	0.3kg (0.8lb)
350	0.3kg (0.8lb)	0.4kg (0.8lb)	0.4kg (0.8lb)
400	0.4kg (0.9lb)	0.4kg (0.9lb)	0.4kg (1lb)
450	0.4kg (1lb)	0.5kg (1lb)	0.5kg (1lb)
500	0.5kg (1.1lb)	0.5kg (1.1lb)	0.5kg (1.1lb)
550	0.5kg (1.1lb)	0.5kg (1.2lb)	0.6kg (1.2lb)
600	0.6kg (1.2lb)	0.6kg (1.3lb)	0.6kg (1.3lb)
650	0.6kg (1.3lb)	0.6kg (1.3lb)	0.6kg (1.4lb)
700	0.6kg (1.4lb)	0.7kg (1.4lb)	0.7kg (1.5lb)
750	0.7kg (1.5lb)	0.7kg (1.5lb)	0.7kg (1.6lb)
800	0.7kg (1.6lb)	0.7kg (1.6lb)	0.7kg (1.7lb)
850	0.8kg (1.7lb)	0.8kg (1.7lb)	0.8kg (1.8lb)
900	0.8kg (1.8lb)	0.8kg (1.8lb)	0.8kg (1.9lb)
950	0.8kg (1.9lb)	0.9kg (1.9lb)	0.9kg (1.9lb)
1000	0.9kg (1.9lb)	0.9kg (2lb)	0.9kg (2lb)
1050	0.9kg (2lb)	0.9kg (2.1lb)	1kg (2.1lb)
1100	1kg (2.1lb)	1kg (2.2lb)	1kg (2.2lb)
1150	1kg (2.2lb)	1kg (2.3lb)	1kg (2.3lb)
1200	1kg (2.3lb)	1.1kg (2.4lb)	1.1kg (2.4lb)
1250	1.1kg (2.4lb)	1.1kg (2.4lb)	1.1kg (2.5lb)
1300	1.1kg (2.5lb)	1.2kg (2.5lb)	1.2kg (2.6lb)
1350	1.2kg (2.6lb)	1.2kg (2.6lb)	1.2kg (2.7lb)
1400	1.2kg (2.7lb)	1.2kg (2.7lb)	1.3kg (2.8lb)
1450	1.3kg (2.8lb)	1.3kg (2.8lb)	1.3kg (2.9lb)
1500	1.3kg (2.9lb)	1.3kg (2.9lb)	1.3kg (2.9lb)

Lead Wire

Motor Cable	UL 1430
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.	

Supplied 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 (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

