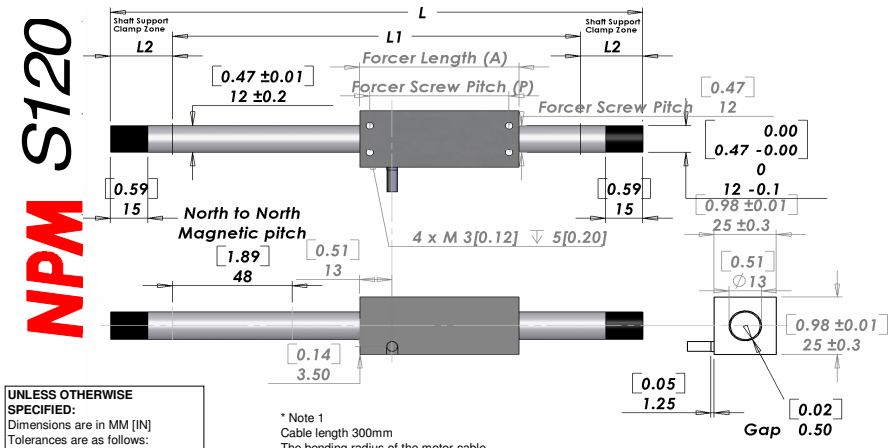


UNLESS OTHERWISE SPECIFIED:
Dimensions are in MM [IN]
Tolerances are as follows:

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 10.72mm (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.

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

		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 (4.05lbs)	26.4N (5.93lbs)	36N (8.0lbs)
Peak Current[2]		1.6Arms	1.6Arms	1.6Arms
Force Constant	Kf	11N/Arms (2.5lbs/Arms)	17N/Arms (3.7lbs/Arms)	22N/Arms (5.0lbs/Arms)
Back EMF		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
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.

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, consult Nippon Pulse America.

3) All winding parameters listed are measured line-to-line (phase-to-phase).

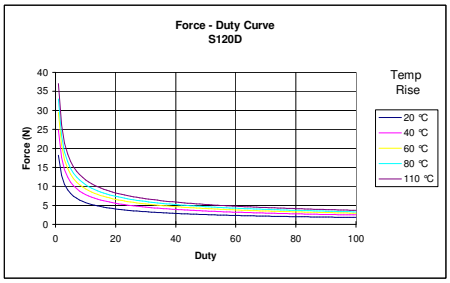
Thermal Specifications

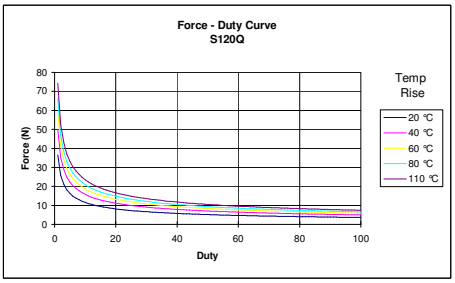
		S120D	S120T	S120Q
Max phase temperature		135°C (275°F)	135°C (275°F)	135°C (275°F)
Thermal Resistance	Kq	18.6°C/W	12.7°C/W	9.4°C/W

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) **Maximum Stroke length 1750mm (68.9in)**

Stroke \ Motor Type	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	544mm (21.4in)	568mm (22.4in)	592mm (23.3in)
450	594mm (23.4in)	618mm (24.3in)	642mm (25.3in)
500	644mm (25.4in)	668mm (26.3in)	692mm (27.2in)
550	694mm (27.3in)	718mm (28.3in)	742mm (29.2in)
600	744mm (29.3in)	768mm (30.2in)	792mm (31.2in)
650	794mm (31.3in)	818mm (32.2in)	842mm (33.1in)
700	844mm (33.2in)	868mm (34.2in)	892mm (35.1in)
750	894mm (35.2in)	918mm (36.1in)	942mm (37.1in)
800	944mm (37.2in)	968mm (38.1in)	992mm (39.1in)
850	1034mm (40.7in)	1058mm (41.7in)	1082mm (42.6in)
900	1084mm (42.7in)	1108mm (43.6in)	1132mm (44.6in)
950	1134mm (44.6in)	1158mm (45.6in)	1182mm (46.5in)
1000	1184mm (46.6in)	1208mm (47.6in)	1232mm (48.5in)
1050	1234mm (48.6in)	1258mm (49.5in)	1282mm (50.5in)
1100	1284mm (50.6in)	1308mm (51.5in)	1332mm (52.4in)
1150	1334mm (52.5in)	1358mm (53.5in)	1382mm (54.4in)
1200	1384mm (54.5in)	1408mm (55.4in)	1432mm (56.4in)
1250	1434mm (56.5in)	1458mm (57.4in)	1482mm (58.3in)
1300	1484mm (58.4in)	1508mm (59.4in)	1532mm (60.3in)
1350	1534mm (60.4in)	1558mm (61.3in)	1582mm (62.3in)
1400	1584mm (62.4in)	1608mm (63.3in)	1632mm (64.3in)
1450	1634mm (64.3in)	1658mm (65.3in)	1682mm (66.2in)
1500	1684mm (66.3in)	1708mm (67.2in)	1732mm (68.2in)
1550	1734mm (68.3in)	1758mm (69.2in)	1782mm (70.2in)
1600	1784mm (70.2in)	1808mm (71.2in)	1832mm (72.1in)
1650	1834mm (72.2in)	1858mm (73.1in)	1882mm (74.1in)
1700	1884mm (74.2in)	1908mm (75.1in)	1932mm (76.1in)
1750	1934mm (76.1in)	1958mm (77.1in)	1982mm (78in)

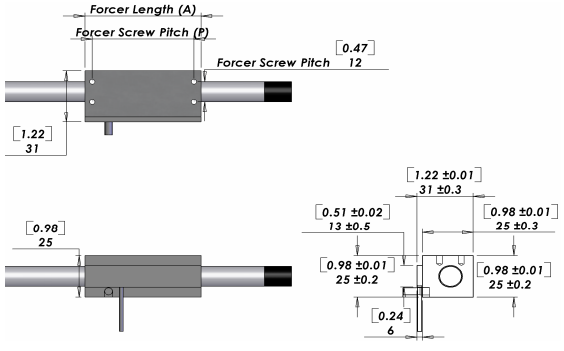
Support and Bending

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)

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 (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)
1550	1.3kg (3lb)	1.4kg (3lb)	1.4kg (3lb)
1600	1.4kg (3lb)	1.4kg (3.1lb)	1.4kg (3.1lb)
1650	1.4kg (3.1lb)	1.4kg (3.2lb)	1.5kg (3.2lb)
1700	1.5kg (3.2lb)	1.5kg (3.3lb)	1.5kg (3.3lb)
1750	1.5kg (3.3lb)	1.5kg (3.4lb)	1.5kg (3.4lb)

Hall Effect (Optional)



* Note 2
Sensor Cable (Lead wires) Specifications
HP-SB20276SR
Wire Type UL758
Wire AWG 28
Length 400 mm (bare leads)
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 27.6 (wire diameter 4.6 * 6) as suggested by the wire manufacturer.
This radius should be maintained. Attach the proper high flex
cable as required by your application.

* 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.

Lead Wire

Motor Cable

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)

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

Dual Forcer

Forcer spacing distance

	S160T	S160Q
Forcer spacing distance	10	10
Pole (North-South) distance	30	30
Forcer length	110	140
Flip forcers	No	Yes

2007/2/28