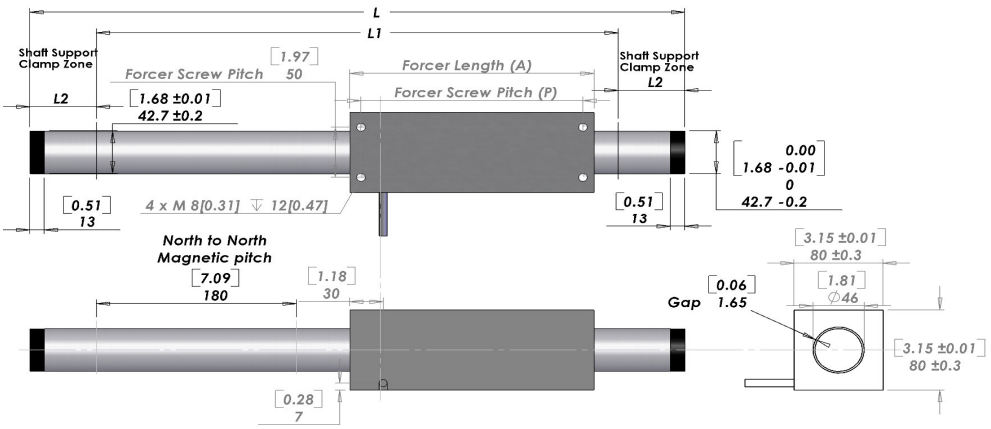
NPM S427



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

		S427D	S427T	S427Q
Continuous Force[1]		100N (22.5lbs)	150N (33.7lbs)	200N (45lbs)
Continuous Current[1]		3.0Arms	3.0Arms	3.0Arms
Peak Force[2]		400N (90lbs)	600N (135lbs)	800N (180lbs)
Peak Current[2]		12Arms	12Arms	12Arms
Force Constant	K_f	33N/Arms (7.5lbs/Arms)	50N/Arms (11.3lbs/Arms)	67N/Arms (15.0lbs/Arms)
Back EMF	K_e	11V/m/s (0.28V/in/s)	17V/m/s (0.42V/in/s)	22V/m/s (0.56V/in/s)
Resistance 25℃, [3]		2.7Ω	3.9Ω	5.2Ω
Inductance[3]		7.3mH	11mH	15mH
Electrical Time Constant		2.70ms	2.82ms	2.88ms
Fundamental Motor Constant	K_m	20.27N√w	25.52N√w	29.21N√w
Magnetic Pitch (North-North)		180mm (7.09in)	180mm (7.09in)	180mm (7.09in)

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℃ 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 America.

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

Thermal Specifications

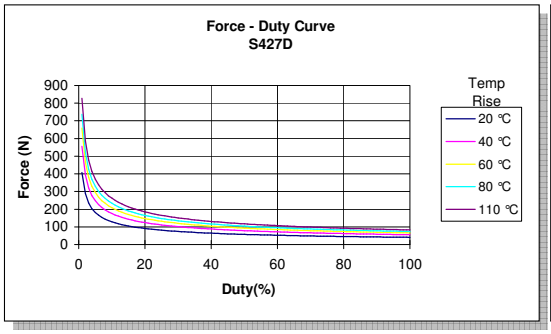
		S427D	S427T	S427Q
Max phase temperature[4]		135℃ (275℉)	135℃ (275℉)	135℃ (275℉)
Thermal Resistance (Coil)	K_q	4.6℃/W	3.2℃/W	2.4℃/W

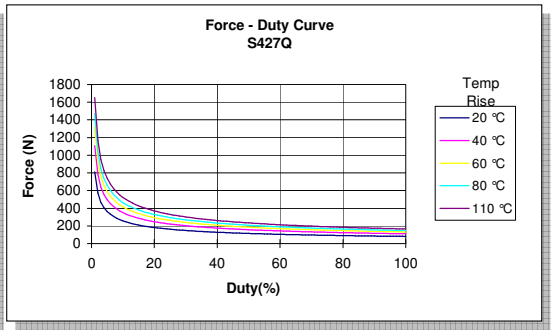
4) The standard temperature difference between the coil and the forcer surface is 30℃

Mechanical Specifications

Forcer

		S427D	S427T	S427Q
Forcer Length	A	220mm (8.66in)	310mm (12.2in)	400mm (15.75in)
Forcer Width		80mm (3.15in)	80mm (3.15in)	80mm (3.15in)
Forcer Screw Pitch	P	200mm (7.87in)	290mm (11.42in)	380mm (14.96in)
Forcer Weight		3.0kg (6.6lbs)	4.2kg (9.3lbs)	5.4kg (11.9lbs)
Gap		1.65mm (0.06in)	1.65mm (0.06in)	1.65mm (0.06in)





Mechanical Specifications

Shaft

Shaft Diameter (D) 42.7 ±0.2mm (1.68in)

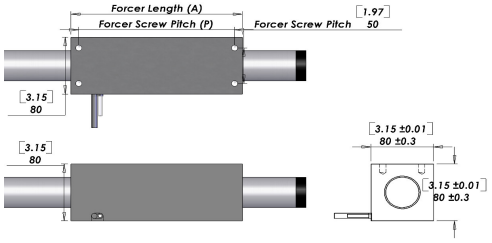
Shaft Length (L) **Maximum Stroke length 3600mm (141.7in)**

Stroke \ Motor Type	S427D	S427T	S427Q
200	540mm (21.3in)	630mm (24.8in)	720mm (28.3in)
250	590mm (23.2in)	680mm (26.8in)	770mm (30.3in)
300	640mm (25.2in)	730mm (28.7in)	820mm (32.3in)
350	690mm (27.2in)	780mm (30.7in)	870mm (34.3in)
400	740mm (29.1in)	830mm (32.7in)	920mm (36.2in)
450	790mm (31.1in)	880mm (34.6in)	970mm (38.2in)
500	840mm (33.1in)	930mm (36.6in)	1020mm (40.2in)
550	890mm (35in)	980mm (38.6in)	1070mm (42.1in)
600	980mm (38.6in)	1070mm (42.1in)	1160mm (45.7in)
650	1030mm (40.6in)	1120mm (44.1in)	1210mm (47.6in)
700	1080mm (42.5in)	1170mm (46.1in)	1260mm (49.6in)
750	1130mm (44.5in)	1220mm (48in)	1310mm (51.6in)
800	1180mm (46.5in)	1270mm (50in)	1360mm (53.5in)
850	1230mm (48.4in)	1320mm (52in)	1410mm (55.5in)
900	1280mm (50.4in)	1370mm (53.9in)	1460mm (57.5in)
950	1330mm (52.4in)	1420mm (55.9in)	1510mm (59.4in)
1000	1380mm (54.3in)	1470mm (57.9in)	1560mm (61.4in)
1050	1470mm (57.9in)	1560mm (61.4in)	1650mm (65in)
1100	1520mm (59.8in)	1610mm (63.4in)	1700mm (66.9in)
1150	1570mm (61.8in)	1660mm (65.4in)	1750mm (68.9in)
1200	1620mm (63.8in)	1710mm (67.3in)	1800mm (70.9in)
1250	1670mm (65.7in)	1760mm (69.3in)	1850mm (72.8in)
1300	1720mm (67.7in)	1810mm (71.3in)	1900mm (74.8in)
1350	1770mm (69.7in)	1860mm (73.2in)	1950mm (76.8in)
1400	1820mm (71.7in)	1910mm (75.2in)	2000mm (78.7in)
1450	1870mm (73.6in)	1960mm (77.2in)	2050mm (80.7in)
1500	1920mm (75.6in)	2010mm (79.1in)	2100mm (82.7in)
1550	1970mm (77.6in)	2060mm (81.1in)	2150mm (84.6in)
1600	2020mm (79.5in)	2110mm (83.1in)	2200mm (86.6in)
1650	2070mm (81.5in)	2160mm (85in)	2250mm (88.6in)
1700	2120mm (83.5in)	2210mm (87in)	2300mm (90.6in)
1750	2170mm (85.4in)	2260mm (89in)	2350mm (92.5in)
1800	2220mm (87.4in)	2310mm (90.9in)	2400mm (94.5in)
1850	2270mm (89.4in)	2360mm (92.9in)	2450mm (96.5in)
1900	2320mm (91.3in)	2410mm (94.9in)	2500mm (98.4in)
1950	2370mm (93.3in)	2460mm (96.9in)	2550mm (100.4in)
2000	2420mm (95.3in)	2510mm (98.8in)	2600mm (102.4in)

Stroke lengths from 100mm and up to 4600mm are available. Please consult Nippon Pulse America for more information.

Support and Bending Stroke	Shaft Support length (L2)	Max Bending
0 → 550	60mm (2.36in)	0.00mm (0.00in)
551 → 1000	80mm (3.15in)	0.15mm (0.006in)
1001 → 1500	100mm (3.94in)	0.60mm (0.024in)
1501 → 2000	100mm (3.94in)	1.10mm (0.043in)
2001 → 2500	100mm (3.94in)	2.00mm (0.079in)
2501 → Max	100mm (3.94in)	2.10mm (0.083in)

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 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.

How to Order (Available Options)

Motor Type	Forcer Size	Usable Stroke	Options	Options	
S427 –	X –	XX –	XX –	XX	
		100 - 4600 mm		(Blank)	Standard
Linear Shaft Motor	D	Double (2) windings		FO	Forcer Only
	T	Triple (3) windings		SO	Shaft Only
	Q	Quadruple (4) windings		XX	Two digit for custom motor
			ST	Standard	
			WP	Waterproof	
			HA	Digital Hall Effect	
			CE	CE type motor	

Shaft Mass Stroke \ Motor Type	S427D	S427T	S427Q
200	4.9kg (10.8lb)	5.8kg (12.8lb)	6.7kg (14.8lb)
250	5.4kg (11.9lb)	6.3kg (13.9lb)	7.2kg (15.9lb)
300	5.9kg (13lb)	6.8kg (15lb)	7.7kg (17lb)
350	6.4kg (14.1lb)	7.3kg (16.1lb)	8.2kg (18.1lb)
400	6.9kg (15.2lb)	7.8kg (17.2lb)	8.7kg (19.2lb)
450	7.4kg (16.3lb)	8.3kg (18.3lb)	9.2kg (20.3lb)
500	7.9kg (17.5lb)	8.8kg (19.4lb)	9.7kg (21.4lb)
550	8.4kg (18.6lb)	9.3kg (20.5lb)	10.2kg (22.5lb)
600	9.1kg (20lb)	10kg (22lb)	10.9kg (24lb)
650	9.6kg (21.1lb)	10.5kg (23.1lb)	11.4kg (25.1lb)
700	10.1kg (22.2lb)	11kg (24.2lb)	11.9kg (26.2lb)
750	10.6kg (23.4lb)	11.5kg (25.3lb)	12.4kg (27.3lb)
800	11.1kg (24.5lb)	12kg (26.4lb)	12.9kg (28.4lb)
850	11.6kg (25.6lb)	12.5kg (27.6lb)	13.4kg (29.5lb)
900	12.1kg (26.7lb)	13kg (28.7lb)	13.9kg (30.6lb)
950	12.6kg (27.8lb)	13.5kg (29.8lb)	14.4kg (31.8lb)
1000	13.1kg (28.9lb)	14kg (30.9lb)	14.9kg (32.9lb)
1050	13.8kg (30.4lb)	14.7kg (32.4lb)	15.6kg (34.3lb)
1100	14.3kg (31.5lb)	15.2kg (33.5lb)	16.1kg (35.4lb)
1150	14.8kg (32.6lb)	15.7kg (34.6lb)	16.6kg (36.6lb)
1200	15.3kg (33.7lb)	16.2kg (35.7lb)	17.1kg (37.7lb)
1250	15.8kg (34.8lb)	16.7kg (36.8lb)	17.6kg (38.8lb)
1300	16.3kg (35.9lb)	17.2kg (37.9lb)	18.1kg (39.9lb)
1350	16.8kg (37lb)	17.7kg (39lb)	18.6kg (41lb)
1400	17.3kg (38.1lb)	18.2kg (40.1lb)	19.1kg (42.1lb)
1450	17.8kg (39.2lb)	18.7kg (41.2lb)	19.6kg (43.2lb)
1500	18.3kg (40.3lb)	19.2kg (42.3lb)	20.1kg (44.3lb)
1550	18.8kg (41.4lb)	19.7kg (43.4lb)	20.6kg (45.4lb)
1600	19.3kg (42.5lb)	20.2kg (44.5lb)	21.1kg (46.5lb)
1650	19.8kg (43.6lb)	20.7kg (45.6lb)	21.6kg (47.6lb)
1700	20.3kg (44.7lb)	21.2kg (46.7lb)	22.1kg (48.7lb)
1750	20.8kg (45.8lb)	21.7kg (47.8lb)	22.6kg (49.8lb)
1800	21.3kg (46.9lb)	22.2kg (48.9lb)	23.1kg (50.9lb)
1850	21.8kg (48lb)	22.7kg (50lb)	23.6kg (52lb)
1900	22.3kg (49.1lb)	23.2kg (51.1lb)	24.1kg (53.1lb)
1950	22.8kg (50.3lb)	23.7kg (52.2lb)	24.6kg (54.2lb)
2000	23.3kg (51.4lb)	24.2kg (53.3lb)	25.1kg (55.3lb)

Lead Wire

Motor Cable

Wire Type	UL 2464
Wire AWG	16
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	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 (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

Forcer spacing distance

	S427T	S427Q
Forcer spacing distance	50	50
Pole (North-South) distance	90	90
Forcer length	310	400
Flip forcers	No	Yes

2009/4/7