

Visit nipponpulse.com to download 3D CAD drawings and 2D prints of this motor.

| | S605D | | S605T | | S605Q | | |
|--|---------------------------|--------------------------|-------------------------|--------------------------|---------------------------|---------------------------|--------------------------|
| Electrical Specs | S605D | S605D 1S | S605T | S605T 1S | S605Q | S605Q 2S | S605Q 1S |
| Continuous Force ¹ | 420N (94.4lbs) | 414N (93.1lbs) | 610N (137.1lbs) | 611 (137.3lbs) | 780N (175.4lbs) | 781N (175.6lbs) | |
| Continuous Current ¹ | 8.8Arms | 18Arms | 8.6Arms | 26Arms | 8.4Arms | 16.8Arms | 34Arms |
| Acceleration Force ² | 1700N (382.2lbs) | 1654 (371.82lbs) | 2400N (539.5lbs) | 2442 (548.9lbs) | 3100N (696.9lbs) | 3125 (702.5lbs) | |
| Acceleration Current ² | 35Arms | 70Arms | 34Arms | 103Arms | 34Arms | 67Arms | 134Arms |
| Force Constant (K _f) | 47N/arms (10.6lbs/amp) | 24N/Arms (5.4lbs/amp) | 71N/Arms (16lbs/amp) | 24N/Arms (5.4lbs/amp) | 93N/Arms (20.9lbs/amp) | 47N/Arms (10.6lbs/amp) | 23N/Arms (5.2lbs/amp) |
| Back EMF (K _e) | 16V/m/s (0.8V/in/s) | 7.8V/m/s (0.39V/in/s) | 24V/m/s (0.6V/in/s) | 7.9V/m/s (0.2V/in/s) | 31V/m/s (0.8V/in/s) | 16V/m/s (0.41V/in/s) | 7.8V/m/s (0.20V/in/s) |
| Resistance 25°C ³ | 1.1Ω | 0.28Ω | 1.7Ω | 0.19Ω | 2.2Ω | 0.55Ω | 0.14Ω |
| Inductance ³ | 6.5mH | 1.6mH | 10mH | 1.1mH | 13mH | 3.3mH | 0.81mH |
| Electric Time Constant | 5.91ms | | 5.88ms | | 5.91ms | | |
| Max. Rated Voltage (AC) | 240V | | | | | | |
| Fundamental Motor Constant (K _m) | 45.51N√W | 44.81N√W | 54.40N√W | 54.46N√W | 62.60N√W | 62.70N√W | |
| Magnetic Pitch (North-North) | 240mm (9.4in) | | | | | | |

Is this the proper Linear Shaft Motor for your application? Use our [SMART sizing program](#) to assist in your decision.

This motor can be customized to fit your application demands; contact your application engineer for more information.

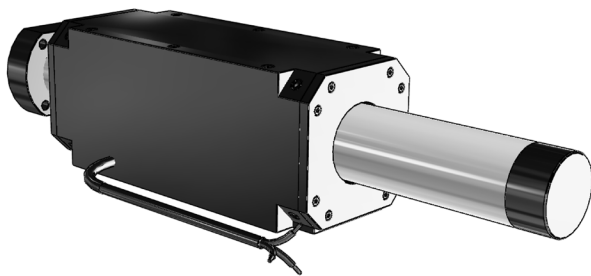
¹ Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking.

² Can be maintained for a maximum of 40 seconds. Higher forces and current possible for short periods of time, consult Nippon Pulse for more information.

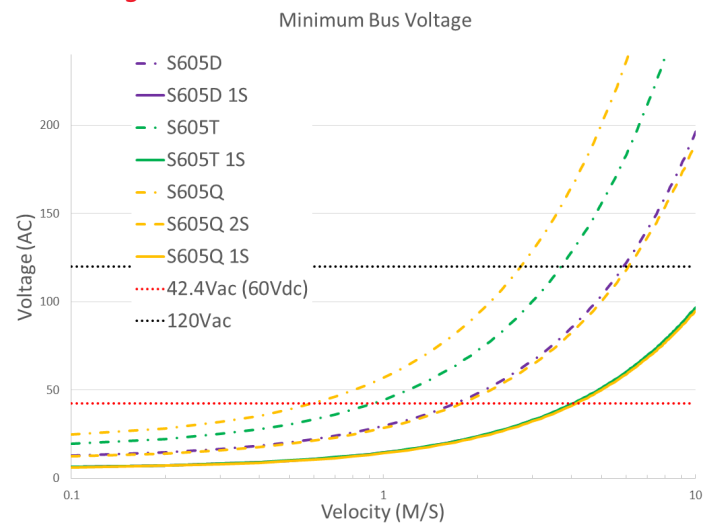
³ All winding parameters listed are measured line-to-line (phase-to-phase).

| Thermal Specs | S605D | S605T | S605Q |
|---|---------------|---------|---------|
| Max Phase Temperature ⁴ | 135°C (275°F) | | |
| Thermal Resistance (Coil) (K _q) | 1.3°C/W | 0.9°C/W | 0.7°C/W |

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



Bus Voltage



Part Numbering System

| | | | | | | |
|---|-------------------|---|--|------------------------------------|---|--|
| S | Shaft Size 605 | Forcer Size (A) <u>X</u> | Parallel Option <u>XX</u> | Usable Stroke (S) <u>XXXXst</u> | Options <u>XX</u> | Options <u>XX</u> |
| | | D: Double (2) windings T: Triple (3) windings Q: Quadruple (4) windings | Blank: Single Motor PL: Parallel Motors | 200-2000mm | Blank: Standard WP: Water Resistant HA: Digital Hall Effect | Blank: Standard FO: Forcer Only SO: Shaft Only |

These motors have not received a CE Declaration of Conformity, and as such are designated FGA.

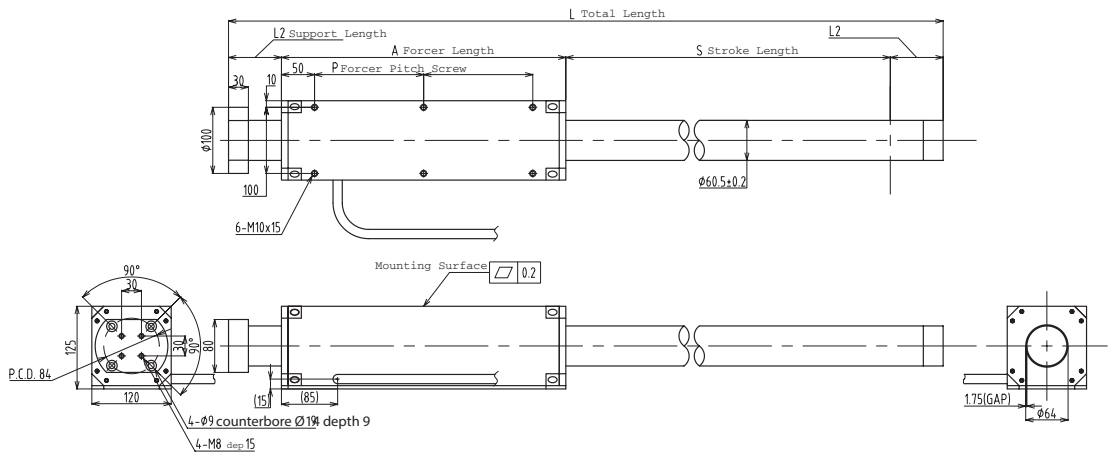
| Forcer Specs | S605D | S605T | S605Q |
|------------------------|----------------------------|----------------|----------------|
| Forcer Length (A) | 310mm (12.2in) | 430mm (16.9in) | 550mm (21.7in) |
| Forcer Width | 125 x 120mm (4.9 x 4.72in) | | |
| Forcer Screw Pitch (P) | 105mm (4.13in) | 165mm (6.5in) | 225mm (8.9in) |
| Forcer Weight | 16kg (35.3lbs) | 21kg (46.3lbs) | 27kg (59.5lbs) |
| Gap | 1.75mm (0.07in) | | |
| Screw | M10 | | |
| Tightening Torque | 24 Nm | | |

Tolerances are as follows:

| Dimension (mm) | Tolerance (mm) |
|----------------|----------------|
| 0 - 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 Support Length
A = See Forcer Length
P = See Forcer Screw Pitch

Unless otherwise specified, dimensions are in mm



Note: Cable length 300mm. The bending radius of the motor cable should be 36.6mm (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.

Hall Effect Specs

Technical drawing of the Hall Effect sensor assembly. The side view shows dimensions: Forcer Length (A), Forcer Screw Pitch (P), Forcer Screw Pitch [3.15], Forcer Screw Pitch 80, 3.94 100, 4.33 110, 2.20 56, 0.39 10, 8.27 210, 4.13 105, 2.20 56, 0.39 10. The end view shows dimensions: 4.33 110, 3.94 100, 2.20 56, 4.13 105, 0.39 10.

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 R27.6mm (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.

FGA/CE Type Motor Cable

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

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

Forcer Spacing Distance

| Spec | S605T | S605Q |
|-------------------------|-------|-------|
| Forcer Spacing Distance | 50mm | |
| Pole (N/S) Distance | 120mm | |
| Forcer Length | 430mm | 550mm |
| Flip Forcers | No | Yes |

Tandem S605D forcers are possible, but are equivalent to one (1) S605Q forcer and thus are not listed above.

Shaft Length (L)

| Stroke | S605D | S605T | S605Q |
|--------|--|------------------|------------------|
| 100 | Stroke is less than the electrical cycle length. | | |
| 150 | Contact Nippon Pulse. | | |
| 200 | 670mm (26.4in) | 790mm (31.1in) | 910mm (35.8in) |
| 250 | 720mm (28.3in) | 840mm (33.1in) | 960mm (37.8in) |
| 300 | 770mm (30.3in) | 890mm (35in) | 1010mm (39.8in) |
| 350 | 820mm (32.3in) | 940mm (37in) | 1060mm (41.7in) |
| 400 | 870mm (34.3in) | 990mm (39in) | 1110mm (43.7in) |
| 450 | 920mm (36.2in) | 1040mm (40.9in) | 1160mm (45.7in) |
| 500 | 970mm (38.2in) | 1090mm (42.9in) | 1210mm (47.6in) |
| 550 | 1020mm (40.2in) | 1140mm (44.9in) | 1260mm (49.6in) |
| 600 | 1070mm (42.1in) | 1190mm (46.9in) | 1310mm (51.6in) |
| 650 | 1120mm (44.1in) | 1240mm (48.8in) | 1360mm (53.5in) |
| 700 | 1170mm (46.1in) | 1290mm (50.8in) | 1410mm (55.5in) |
| 750 | 1220mm (48in) | 1340mm (52.8in) | 1460mm (57.5in) |
| 800 | 1310mm (51.6in) | 1430mm (56.3in) | 1550mm (61in) |
| 850 | 1360mm (53.5in) | 1480mm (58.3in) | 1600mm (63in) |
| 900 | 1410mm (55.5in) | 1530mm (60.2in) | 1650mm (65in) |
| 950 | 1460mm (57.5in) | 1580mm (62.2in) | 1700mm (66.9in) |
| 1000 | 1510mm (59.4in) | 1630mm (64.2in) | 1750mm (68.9in) |
| 1050 | 1560mm (61.4in) | 1680mm (66.1in) | 1800mm (70.9in) |
| 1100 | 1610mm (63.4in) | 1730mm (68.1in) | 1850mm (72.8in) |
| 1150 | 1650mm (65in) | 1780mm (70.1in) | 1900mm (74.8in) |
| 1200 | 1710mm (67.3in) | 1830mm (72in) | 1950mm (76.8in) |
| 1250 | 1750mm (68.9in) | 1880mm (74in) | 2000mm (78.7in) |
| 1300 | 1810mm (71.3in) | 1930mm (76in) | 2050mm (80.7in) |
| 1350 | 1860mm (73.2in) | 1980mm (78in) | 2100mm (82.7in) |
| 1400 | 1910mm (75.2in) | 2030mm (79.9in) | 2150mm (84.6in) |
| 1450 | 1960mm (77.2in) | 2080mm (81.9in) | 2200mm (86.6in) |
| 1500 | 2010mm (79.1in) | 2130mm (83.9in) | 2250mm (88.6in) |
| 1550 | 2100mm (82.7in) | 2180mm (85.8in) | 2300mm (90.6in) |
| 1600 | 2150mm (84.6in) | 2230mm (87.8in) | 2350mm (92.5in) |
| 1650 | 2200mm (86.6in) | 2280mm (89.8in) | 2400mm (94.5in) |
| 1700 | 2250mm (88.6in) | 2330mm (91.7in) | 2450mm (96.5in) |
| 1750 | 2300mm (90.6in) | 2380mm (93.7in) | 2500mm (98.4in) |
| 1800 | 2350mm (92.5in) | 2430mm (95.7in) | 2550mm (100.4in) |
| 1850 | 2400mm (94.5in) | 2480mm (97.6in) | 2600mm (102.4in) |
| 1900 | 2450mm (96.5in) | 2530mm (99.6in) | 2650mm (104.3in) |
| 1950 | 2500mm (98.4in) | 2580mm (101.6in) | 2700mm (106.3in) |
| 2000 | 2550mm (100.4in) | 2630mm (103.5in) | 2750mm (108.3in) |

Shaft Mass

| Stroke | S605D | S605T | S605Q |
|--------|--|------------------|------------------|
| 100 | Stroke is less than the electrical cycle length. | | |
| 150 | Contact Nippon Pulse. | | |
| 200 | 13.57kg (29.9lb) | 14.9kg (32.9lb) | 17.3kg (38.2lb) |
| 250 | 14.58kg (32.1lb) | 15.9kg (35.1lb) | 18.3kg (40.4lb) |
| 300 | 15.59kg (34.4lb) | 16.9kg (37.3lb) | 19.3kg (42.6lb) |
| 350 | 16.59kg (36.6lb) | 17.9kg (39.5lb) | 20.3kg (44.8lb) |
| 400 | 17.60kg (38.8lb) | 18.9kg (41.7lb) | 21.3kg (47.1lb) |
| 450 | 18.61kg (41lb) | 19.9kg (43.9lb) | 22.3kg (49.3lb) |
| 500 | 19.61kg (43.2lb) | 20.9kg (46.2lb) | 23.4kg (51.5lb) |
| 550 | 20.62kg (45.5lb) | 21.9kg (48.4lb) | 24.4kg (53.7lb) |
| 600 | 21.62kg (47.7lb) | 23kg (50.6lb) | 25.4kg (55.9lb) |
| 650 | 22.63kg (49.9lb) | 24kg (52.8lb) | 26.4kg (58.1lb) |
| 700 | 23.64kg (52.1lb) | 25kg (55lb) | 27.4kg (60.4lb) |
| 750 | 24.64kg (54.3lb) | 26kg (57.3lb) | 28.4kg (62.6lb) |
| 800 | 26.20kg (57.8lb) | 27kg (59.5lb) | 29.4kg (64.8lb) |
| 850 | 27.21kg (60lb) | 28kg (61.7lb) | 30.4kg (67lb) |
| 900 | 28.22kg (62.2lb) | 29kg (63.9lb) | 31.4kg (69.2lb) |
| 950 | 29.22kg (64.4lb) | 30kg (66.1lb) | 32.4kg (71.5lb) |
| 1000 | 30.23kg (66.6lb) | 31kg (68.3lb) | 33.4kg (73.7lb) |
| 1050 | 31.24kg (68.9lb) | 32kg (70.6lb) | 34.4kg (75.9lb) |
| 1100 | 32.24kg (71.1lb) | 33kg (72.8lb) | 35.4kg (78.1lb) |
| 1150 | 33.25kg (73.3lb) | 34kg (75lb) | 36.4kg (80.3lb) |
| 1200 | 34.25kg (75.5lb) | 35kg (77.2lb) | 37.4kg (82.5lb) |
| 1250 | 35.26kg (77.7lb) | 36kg (79.4lb) | 38.4kg (84.8lb) |
| 1300 | 36.27kg (80lb) | 37kg (81.7lb) | 39.5kg (87lb) |
| 1350 | 37.27kg (82.2lb) | 38kg (83.9lb) | 40.5kg (89.2lb) |
| 1400 | 38.28kg (84.4lb) | 39.1kg (86.1lb) | 41.5kg (91.4lb) |
| 1450 | 39.28kg (86.6lb) | 40.1kg (88.3lb) | 42.5kg (93.6lb) |
| 1500 | 40.29kg (88.8lb) | 41.1kg (90.5lb) | 43.5kg (95.9lb) |
| 1550 | 41.30kg (91.1lb) | 42.1kg (92.7lb) | 44.5kg (98.1lb) |
| 1600 | 42.30kg (93.3lb) | 43.1kg (95lb) | 45.5kg (100.3lb) |
| 1650 | 43.31kg (95.5lb) | 44.1kg (97.2lb) | 46.5kg (102.5lb) |
| 1700 | 44.32kg (97.7lb) | 45.1kg (99.4lb) | 47.5kg (104.7lb) |
| 1750 | 45.32kg (99.9lb) | 46.1kg (101.6lb) | 48.5kg (106.9lb) |
| 1800 | 46.33kg (102.1lb) | 47.1kg (103.8lb) | 49.5kg (109.2lb) |
| 1850 | 47.33kg (104.3lb) | 48.1kg (106.1lb) | 50.5kg (111.4lb) |
| 1900 | 48.34kg (106.6lb) | 49.1kg (108.3lb) | 51.5kg (113.6lb) |
| 1950 | 49.35kg (108.8lb) | 50.1kg (110.5lb) | 52.5kg (115.8lb) |
| 2000 | 50.35kg (111lb) | 51.1kg (112.7lb) | 53.5kg (118lb) |

Additional stroke lengths are available (up to 3000mm). Contact Nippon Pulse for more information.

Tandem Forcer



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 36.6mm 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.

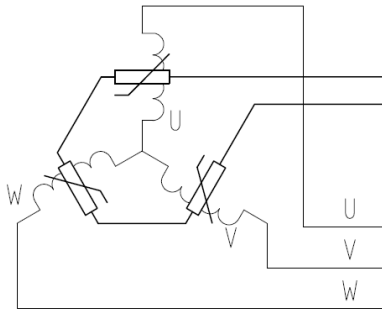
Support and Bending

| Stroke | Support Length (L2) | 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)

THM Option



Circuit Diagram

4. Thermistor
PTCSL20T071DBE(Vishay)

Thermocouple

Thermal sensor

Thermocouple K type (marked each phase name)

Attached to the surface of inside of coil

Length 3000mm

Note: Metric units guaranteed. Imperial (United States customary) units are calculated.

For assistance in selecting the best motor for your application, contact Nippon Pulse to speak with an applications engineer. 1-540-633-1677

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