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|  | S080D                      |                            | S080T                      |                            | S080Q                      |                            |                            |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Electrical Specs                             | S080D                      | S080D 1S                   | S080T                      | S080T 1S                   | S080Q                      | S080Q 2S                   | S080Q 1S                   |
| Continuous Force <sup>1</sup>                | 1.8N (0.4lbs)              |                            | 2.7N (0.61lbs)             |                            | 3.5N (0.79lbs)             |                            |                            |
| Continuous Current <sup>1</sup>              | 0.84Arms                   | 1.7Arms                    | 0.84Arms                   | 2.5Arms                    | 0.84Arms                   | 1.7Arms                    | 3.4Arms                    |
| Acceleration Force <sup>2</sup>              | 7.2N (1.6lbs)              |                            | 11N (2.4lbs)               |                            | 14N (3.1lbs)               |                            |                            |
| Acceleration Current <sup>2</sup>            | 3.4Arms                    | 6.7Arms                    | 3.4Arms                    | 10Arms                     | 3.4Arms                    | 6.7Arms                    | 13Arms                     |
| Force Constant (K <sub>f</sub> )             | 2.1N/Arms<br>(0.48lbs/amp) | 1.1N/Arms<br>(0.25lbs/amp) | 3.2N/Arms<br>(0.72lbs/amp) | 1.1N/Arms<br>(0.25lbs/amp) | 4.2N/Arms<br>(0.94lbs/amp) | 2.1N/Arms<br>(0.47lbs/amp) | 1.0N/Arms<br>(0.22lbs/amp) |
| Back EMF (K <sub>e</sub> )                   | 0.71V/m/s<br>(0.02V/in/s)  | 0.36V/m/s<br>(0.01V/in/s)  | 1.1V/m/s<br>(0.03V/in/s)   | 0.36V/m/s<br>(0.01V/in/s)  | 1.4V/m/s<br>(0.04V/in/s)   | 0.70V/m/s<br>(0.02V/in/s)  | 0.35V/m/s<br>(0.01V/in/s)  |
| Resistance 25°C, <sup>3</sup>                | 4.7Ω                       | 1.2Ω                       | 6.8Ω                       | 0.76Ω                      | 9.0Ω                       | 2.3Ω                       | 0.56Ω                      |
| Inductance <sup>3</sup>                      | 0.7mH                      | 0.18mH                     | 1.0mH                      | 0.11mH                     | 1.3mH                      | 0.33mH                     | 0.081mH                    |
| Electric Time Constant                       | 0.149ms                    |                            | 0.147ms                    |                            | 0.144ms                    |                            |                            |
| Max. Rated Voltage (AC)                      | 240V                       |                            |                            |                            |                            |                            |                            |
| Fundamental Motor Constant (K <sub>m</sub> ) | 0.98N√W                    |                            | 1.23N√W                    |                            | 1.39N√W                    |                            |                            |
| Magnetic Pitch (North-North)                 | 30mm (1.18in)              |                            |                            |                            |                            |                            |                            |

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.

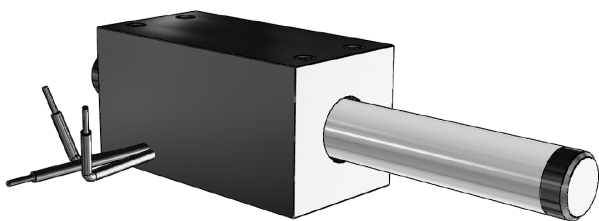
<sup>1</sup> Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking.

<sup>2</sup> 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.

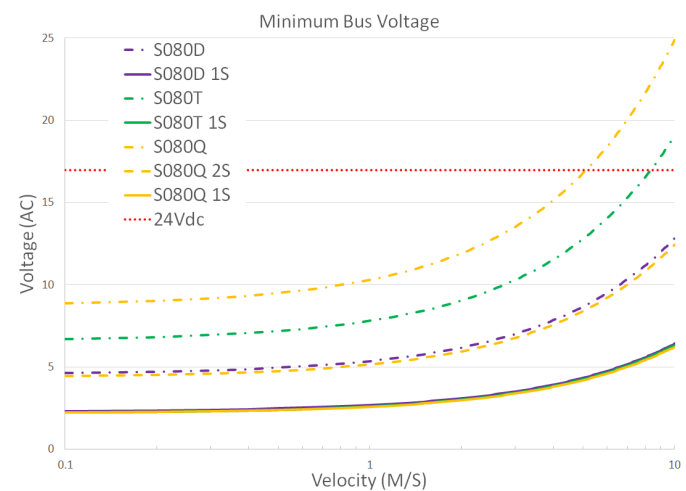
<sup>3</sup> All winding parameters listed are measured line-to-line (phase-to-phase).

| Thermal Specs                       | S080D             | S080T             | S080Q             |
|-------------------------------------|-------------------|-------------------|-------------------|
| Max Phase Temperature <sup>4</sup>  | 135°C (275°F)     |                   |                   |
| Thermal Resistance (Coil) ( $K_q$ ) | 33.2°C/W (92°F/W) | 22.9°C/W (73°F/W) | 17.3°C/W (63°F/W) |

<sup>4</sup> The standard temperature difference between the coil and the forcer surface is 10°C.



### Bus Voltage



### Part Numbering System

| S | Shaft Size<br>080 | Forcer Size (A)<br><u>X</u>   | Parallel Option<br><u>XX</u>               | Usable Stroke (S)<br><u>XXXXst</u> | Options<br><u>XX</u>   | Options<br><u>XX</u>                                 |
|---|-------------------|---|--|------------------------------------|--|--|
|   |                   | D: Double (2) windings<br>T: Triple (3) windings<br>Q: Quadruple (4) windings | Blank: Single Motor<br>PL: Parallel Motors | 25-300mm                           | Blank: Standard<br>WP: Water Resistant<br>HA: Digital Hall Effect<br>CE: CE type motor<br>FG: Frame Ground | Blank: Standard<br>FO: Forcer Only<br>SO: Shaft Only |

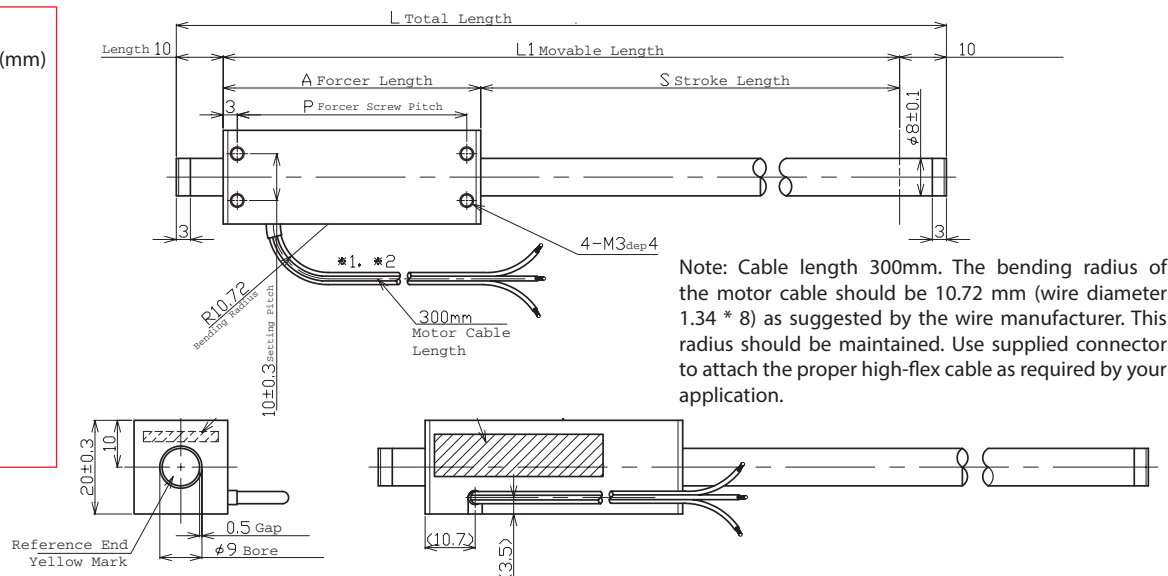
| Forcer Specs           | S080D            | S080T            | S080Q            |
|------------------------|------------------|------------------|------------------|
| Forcer Length (A)      | 40mm (1.57in)    | 55mm (2.17in)    | 70mm (2.76in)    |
| Forcer Width           | 20mm (0.79in)    |                  |                  |
| Forcer Screw Pitch (P) | 34mm (1.34in)    | 49mm (1.93in)    | 64mm (2.52in)    |
| Forcer Weight          | 0.05kg (0.11lbs) | 0.06kg (0.13lbs) | 0.08kg (0.18lbs) |
| Gap                    | 0.50mm (0.02lbs) |                  |                  |

Tolerances are as follows:

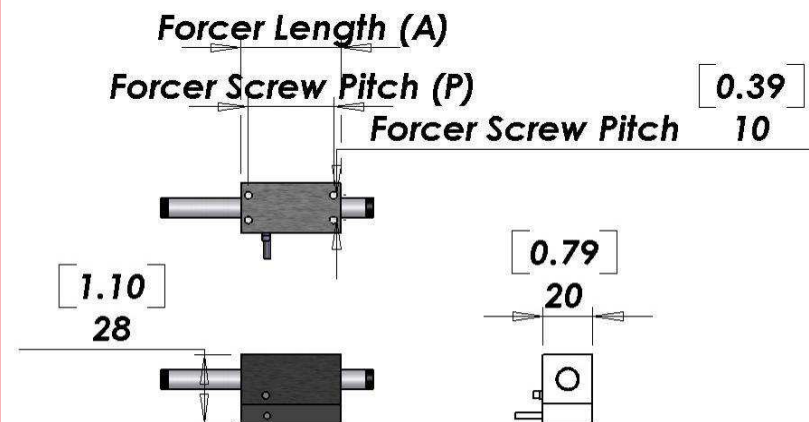
| Dimension (mm) | Tolerance (mm) |
|----------------|----------------|
| 0 - 6          | ±0.1           |
| 7 - 30         | ±0.2           |
| 31 - 120       | ±0.3           |
| 121 - 315      | ±0.5           |
| 316 - 1000     | ±0.8           |
| 1001 - 2000    | ±1.2           |
| 2000 -         | ±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



## Hall Effect Specs

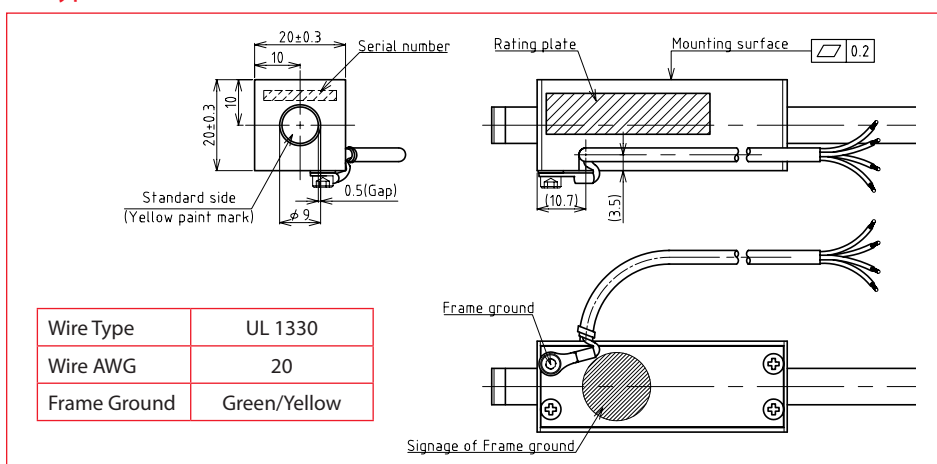


## Sensor Cable Specs

|               |              |
|---------------|--------------|
| 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     |
| No Connection | Gray/Black   |

The bending radius of the sensor cable should be R10.72 mm (wire diameter 1.38 \* 8) as suggested by the wire manufacturer. This radius should be maintained.

## FG Type Motor Cable



## Shaft Length (L)

| Stroke | S080D          | S080T          | S080Q          |
|--------|----------------|----------------|----------------|
| 25     | 85mm (3.3in)   | 100mm (3.9in)  | 115mm (4.5in)  |
| 50     | 110mm (4.3in)  | 125mm (4.9in)  | 140mm (5.5in)  |
| 100    | 160mm (6.3in)  | 175mm (6.9in)  | 190mm (7.5in)  |
| 150    | 210mm (8.3in)  | 225mm (8.9in)  | 240mm (9.4in)  |
| 200    | 260mm (10.2in) | 275mm (10.8in) | 290mm (11.4in) |

Shaft Diameter (D) - 8mm ±0.1

Total Length (L)=Stroke (S)+Forcer Length (A)+(Support Length (L2)x2)

Additional stroke lengths are available (up to 230mm for S080D and up to 215mm for S080T). Contact Nippon Pulse for more information.

## Shaft Mass

| Stroke | S080D           | S080T           | S080Q           |
|--------|-----------------|-----------------|-----------------|
| 25     | 0.02kg (0.05lb) | 0.03kg (0.06lb) | 0.03kg (0.07lb) |
| 50     | 0.03kg (0.07lb) | 0.04kg (0.08lb) | 0.04kg (0.09lb) |
| 100    | 0.05kg (0.11lb) | 0.05kg (0.12lb) | 0.06kg (0.13lb) |
| 150    | 0.07kg (0.15lb) | 0.07kg (0.16lb) | 0.08kg (0.17lb) |
| 200    | 0.08kg (0.19lb) | 0.09kg (0.2lb)  | 0.1kg (0.21lb)  |

## Forcer Spacing Distance

| Spec                    | S080T | S080Q |
|-------------------------|-------|-------|
| Forcer Spacing Distance | 5mm   |       |
| Pole (N/S) Distance     | 15mm  |       |
| Forcer Length           | 55mm  | 70mm  |
| Flip Forcers            | No    | Yes   |

Tandem S080D forcers are possible, but are equivalent to one (1) S080Q forcer and thus are not listed above.

## Tandem Forcer



Forcer Spacing Distance

## Support and Bending

| Stroke | Support Length (L2) | Max. Bending |
|--------|---------------------|--------------|
| All    | 10mm                | 0.05mm       |

## 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.

## Standard Lead Wire

|           |         |
|-----------|---------|
| 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 10.72 mm as suggested by the wire manufacturer.

## CE Type Lead Wire Option

|             |         |
|-------------|---------|
| Ground Wire | CE      |
| Wire Type   | UL 1330 |
| Wire AWG    | 24      |
| U Phase     | Red     |
| V Phase     | White   |
| 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. FG type with insulating sheet between coils and case. Meets all requirements of EN60034-1 (1998).

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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