

Visit [nipponpulse.com](http://nipponpulse.com) to download 3D CAD drawings and 2D prints of this motor.

| Electrical Specs                     | S040D                  | S040T                  | S040Q                  | S040X                  |
|--------------------------------------|------------------------|------------------------|------------------------|------------------------|
| Continuous Force <sup>1</sup>        | 0.29N (0.07lbs)        | 0.45N (0.10lbs)        | 0.58N (0.13lbs)        | 0.94 (0.22lbs)         |
| Continuous Current <sup>1</sup>      | 0.3Arms                |                        |                        | 0.6Arms                |
| Acceleration Force <sup>2</sup>      | 1.2N (0.27lbs)         | 1.8N (0.40lbs)         | 2.3N (0.52lbs)         | 3.8N (0.86lbs)         |
| Acceleration Current <sup>2</sup>    | 1.1Arms                |                        |                        | 2.2Arms                |
| Force Constant ( $K_f$ )             | 1.0N/amp (0.23lbs/amp) | 1.6N/amp (0.37lbs/amp) | 2.1N/amp (0.47lbs/amp) | 1.7N/amp (0.39lbs/amp) |
| Back EMF ( $K_e$ )                   | 0.4V/m/s (0.01V/in/s)  | 0.5V/m/s (0.01V/in/s)  | 0.7V/m/s (0.02V/in/s)  | 0.6V/m/s (0.02V/in/s)  |
| Resistance 25°C, <sup>3</sup>        | 11.2Ω                  | 16.8Ω                  | 22.4Ω                  | 11.2Ω                  |
| Inductance <sup>3</sup>              | 0.5mH                  | 0.7mH                  | 1.0mH                  | 0.5mH                  |
| Electric Time Constant               | 0.045ms                | 0.042ms                | 0.044ms                | 0.045ms                |
| Fundamental Motor Constant ( $K_m$ ) | 0.31N√W                | 0.39N√W                | 0.44N√W                | 0.50N√W                |
| Magnetic Pitch (North-North)         | 18mm (0.71in)          |                        |                        |                        |

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.

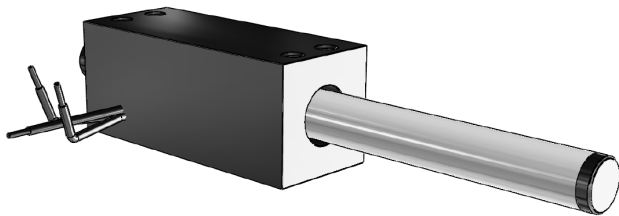
<sup>1</sup> Based on a temp rise of coil surface of 110°K over 25°C ambient temperature stalled forcer, and no external cooling or heat sinking.

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

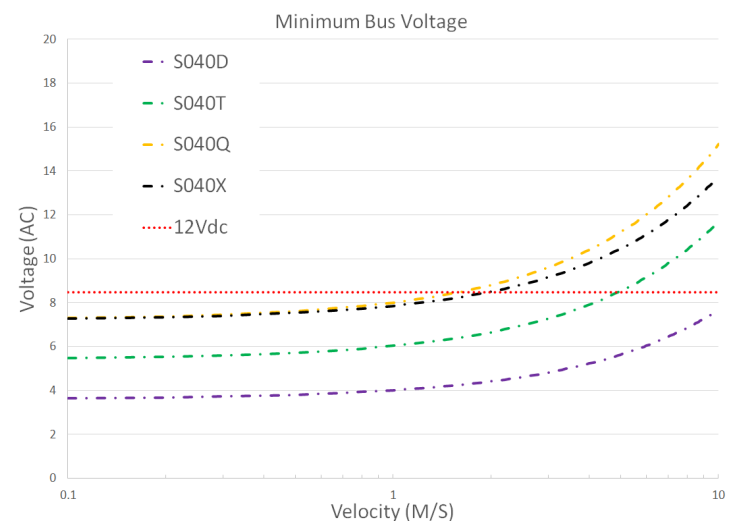
<sup>3</sup> All winding parameters listed are measured line-to-line (phase-to-phase).

| Thermal Specs                       | S040D               | S040T              | S040Q              | S040X               |
|-------------------------------------|---------------------|--------------------|--------------------|---------------------|
| Max Phase Temperature <sup>4</sup>  | 135°C (275°F)       |                    |                    |                     |
| Thermal Resistance (Coil) ( $K_v$ ) | 125.3°C/W (258°F/W) | 83.5°C/W (183°F/W) | 62.6°C/W (145°F/W) | 31.3°C/W (72.5°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 040 — Forcer Size (A) X — Usable Stroke (S) XXXst — Options XX

D: Double (2) windings  
T: Triple (3) windings  
Q: Quadruple (4) windings

Blank: Standard  
FO: Forcer Only  
SO: Shaft Only

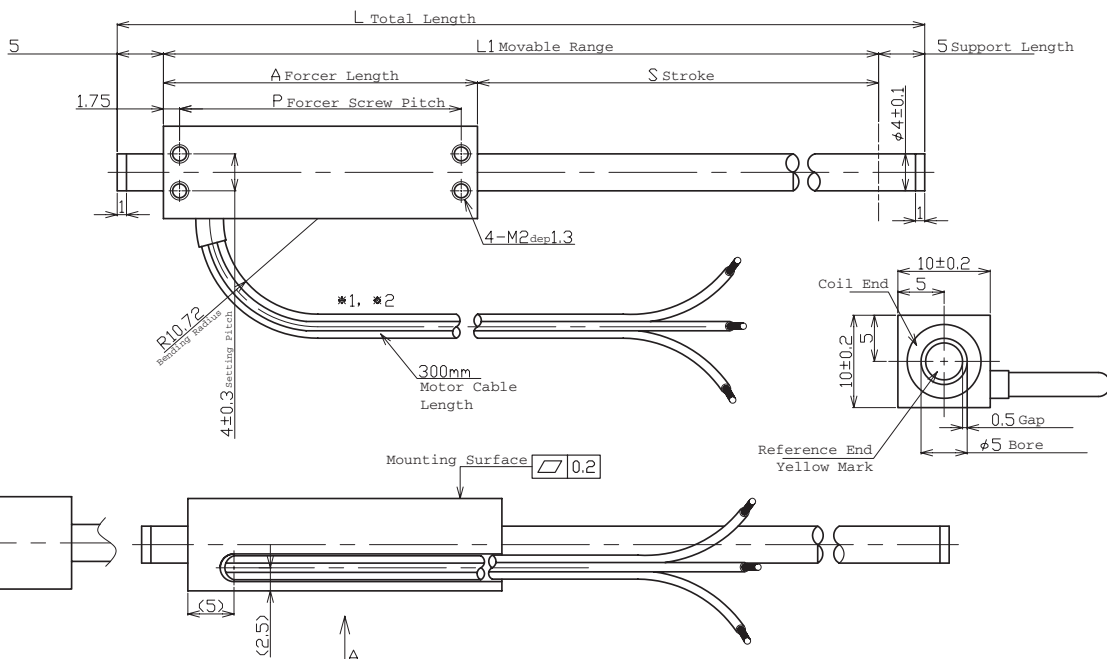
| Forcer Specs           | S040D           | S040T           | S040Q           | S040X           |
|------------------------|-----------------|-----------------|-----------------|-----------------|
| Forcer Length (A)      | 25mm (0.98in)   | 34mm (1.34in)   | 43mm (1.69in)   | 79mm (3.1in)    |
| Forcer Width           | 10mm (0.39in)   |                 |                 |                 |
| Forcer Screw Pitch (P) | 21.5mm (0.85in) | 30.5mm (1.20in) | 39.5mm (1.56in) | 75.5mm (2.97in) |
| Forcer Weight          | 9g (0.02lb)     | 11g (0.02lb)    | 14g (0.03lb)    | 35g (1.23oz)    |
| Gap                    | 0.50mm (0.02in) |                 |                 |                 |

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 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.

### Shaft Length (L)

| Stroke | S040D        | S040T        | S040Q        | S040X         |
|--------|--------------|--------------|--------------|---------------|
| 20     | 55mm (2.2in) | 64mm (2.5in) | 73mm (2.9in) | 109mm (4.3in) |
| 30     | 65mm (2.6in) | 74mm (2.9in) | 83mm (3.3in) | 119mm (4.7in) |
| 40     | 75mm (3.0in) | 84mm (3.3in) | 93mm (3.7in) | 129mm (5.1in) |

Shaft Diameter - 4mm ±0.1

Additional stroke lengths are available (up to 250mm for S040D, and up to 200mm for S040T, S040Q, S040X). Contact Nippon Pulse for more information.

### Shaft Mass

| Stroke | S040D         | S040T         | S040Q         | S040X          |
|--------|---------------|---------------|---------------|----------------|
| 20     | 5.5g (0.19oz) | 6.4g (0.23oz) | 7.3g (0.26oz) | 10.9g (0.38oz) |
| 30     | 6.5g (0.23oz) | 7.4g (0.26oz) | 8.3g (0.29oz) | 11.9g (0.42oz) |
| 40     | 7.5g (0.26oz) | 8.4g (0.3oz)  | 9.3g (0.33oz) | 12.9g (0.46oz) |

### Forcer Spacing Distance

| Spec                    | S040T | S040Q |
|-------------------------|-------|-------|
| Forcer Spacing Distance | 2mm   |       |
| Pole (N/S) Distance     | 9mm   |       |
| Forcer Length           | 34mm  | 43mm  |
| Flip Forcers            | No    | Yes   |

Tandem S040D forcers are possible, but are equivalent to one (1) S040Q forcer and thus are not listed.

### Support and Bending

| Stroke | Support Length (L2) | Max. Bending |
|--------|---------------------|--------------|
| All    | 5mm                 | 0mm          |

### 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.

### 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 10.72mm as suggested by the wire manufacturer.

### Tandem Forcer



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

www.nipponpulse.com

Serviced By:  
  
Toll Free Phone (877) SERV098  
Toll Free Fax (877) SERV099  
www.electromate.com  
sales@electromate.com