### Electrical Specs

<table>
<thead>
<tr>
<th></th>
<th>S160D</th>
<th>S160T</th>
<th>S160Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Force</td>
<td>10N (2.25lbs)</td>
<td>15N (3.37lbs)</td>
<td>20N (4.5lbs)</td>
</tr>
<tr>
<td>Continuous Current</td>
<td>0.6Arms</td>
<td>0.6Arms</td>
<td>0.6Arms</td>
</tr>
<tr>
<td>Acceleration Force</td>
<td>40N (9.0lbs)</td>
<td>60N (13.5lbs)</td>
<td>80N (18.0lbs)</td>
</tr>
<tr>
<td>Acceleration Current</td>
<td>2.5Arms</td>
<td>2.5Arms</td>
<td>2.5Arms</td>
</tr>
<tr>
<td>Force Constant ($K_f$)</td>
<td>16N/Arms (3.71lbs/amp)</td>
<td>24N/Arms (5.43lbs/amp)</td>
<td>33N/Arms (7.31lbs/amp)</td>
</tr>
<tr>
<td>Back EMF ($K_e$)</td>
<td>5.4V/m/s (0.14V/in/s)</td>
<td>8.1V/m/s (0.2V/in/s)</td>
<td>11V/m/s (0.28V/in/s)</td>
</tr>
<tr>
<td>Resistance 25°C</td>
<td>21Ω</td>
<td>33Ω</td>
<td>43Ω</td>
</tr>
<tr>
<td>Inductance</td>
<td>8.2mH</td>
<td>12mH</td>
<td>16mH</td>
</tr>
<tr>
<td>Electric Time Constant</td>
<td>0.39ms</td>
<td>0.36ms</td>
<td>0.37ms</td>
</tr>
<tr>
<td>Rated Voltage (AC)</td>
<td>240V</td>
<td>240V</td>
<td>240V</td>
</tr>
<tr>
<td>Fundamental Motor Constant ($K_m$)</td>
<td>3.51N√W</td>
<td>4.20N√W</td>
<td>4.96N√W</td>
</tr>
<tr>
<td>Magnetic Pitch (North-North)</td>
<td>60mm (2.36in)</td>
<td>60mm (2.36in)</td>
<td>60mm (2.36in)</td>
</tr>
</tbody>
</table>

### Thermal Specs

<table>
<thead>
<tr>
<th></th>
<th>S160D</th>
<th>S160T</th>
<th>S160Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Phase Temperature</td>
<td>135°C (275°F)</td>
<td>135°C (275°F)</td>
<td>135°C (275°F)</td>
</tr>
<tr>
<td>Thermal Resistance (Coil) ($K_q$)</td>
<td>13.6°C/W (56°F/W)</td>
<td>8.7°C/W (48°F/W)</td>
<td>6.7°C/W (44°F/W)</td>
</tr>
</tbody>
</table>

### Forcer Specs

<table>
<thead>
<tr>
<th></th>
<th>S160D</th>
<th>S160T</th>
<th>S160Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forcer Length (A)</td>
<td>80mm (3.15in)</td>
<td>110mm (4.33in)</td>
<td>140mm (5.51in)</td>
</tr>
<tr>
<td>Forcer Width</td>
<td>30mm ±0.3 (1.181in)</td>
<td>30mm ±0.3 (1.181in)</td>
<td>30mm ±0.3 (1.181in)</td>
</tr>
<tr>
<td>Forcer Screw Pitch (P)</td>
<td>70mm (2.76in)</td>
<td>100mm (3.94in)</td>
<td>130mm (5.12in)</td>
</tr>
<tr>
<td>Forcer Weight</td>
<td>0.15kg (0.33lbs)</td>
<td>0.20kg (0.44lbs)</td>
<td>0.30kg (0.66lbs)</td>
</tr>
<tr>
<td>Gap</td>
<td>0.50mm (0.02in)</td>
<td>0.50mm (0.02in)</td>
<td>0.50mm (0.02in)</td>
</tr>
</tbody>
</table>

*Note 1*
Cable length 300mm
The bending radius of the motor cable should be 26.4mm (wire diameter 4.3 * 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.

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Unless Otherwise Specified:
Dimensions are in mm.
Tolerances are as follows:

<table>
<thead>
<tr>
<th>Dimension (mm)</th>
<th>Tolerance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>±0.1</td>
</tr>
<tr>
<td>7</td>
<td>±0.2</td>
</tr>
<tr>
<td>31</td>
<td>±0.3</td>
</tr>
<tr>
<td>121</td>
<td>±0.5</td>
</tr>
<tr>
<td>316</td>
<td>±0.8</td>
</tr>
<tr>
<td>1001</td>
<td>±1.2</td>
</tr>
<tr>
<td>2000</td>
<td>±1.3</td>
</tr>
</tbody>
</table>

L = See Shaft Length
L1 = Usable Stroke + A
L2 = See Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch

L = Shaft Length
L1 = See Shaft Length
L2 = See Shaft Support Length
A = See Moving Coil Length
P = See Moving Coil Screw Pitch

For all specifications are for reference only. Specifications may change depending on servo driver selected. Consult Nippon Pulse.

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 10cm x 20cm x 1.2cm aluminum heat sink increases continuous force up to 30%.

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

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

4) The standard temperature difference between the coil and the forcer surface is 15°C
Senior 160
Linear Shaft Motor

Lead Wire

- Wire Type: UL 2464FA
- Wire AWG: 25
- U Phase: Red
- V Phase: White
- W Phase: Black

300mm lead wire bare leads
The bending radius of the motor cable should be 26.4mm as suggested by the wire manufacturer.

CE Type Motor Cable

- Wire Type: UL 1330
- Wire AWG: 24
- U Phase: Red
- V Phase: White
- W Phase: Black

Support and Bending

- Stroke: 0-350
- Support Length: 25mm
- Max. Bending: 0.00mm
- Stroke: 351-500
- Support Length: 40mm
- Max. Bending: 0.30mm
- Stroke: 501-800
- Support Length: 40mm
- Max. Bending: 0.50mm
- Stroke: 801-max
- Support Length: 60mm
- Max. Bending: 0.50mm

Tandem Forcer

- Spec: S160T
- S160Q
- Forcer Spacing Distance: 10mm
- 140mm

Part Numbering System

- S: Shaft Size (D)
- 160
- Forcer Size (A)
- D: Double (2) windings
- T: Triple (3) windings
- Q: Quadruple (4) windings
- Parallel Option
- Blank: Single Motor
- PL: Parallel Motors
- Usable Stroke
- 400-1800mm
- Options
- Blank: Standard
- WP: Water Resistant
- HA: Digital Hall Effect
- CE: CE type motor
- Blank Standard
- FO: Forcer Only
- SO: Shaft Only
- # of Forcers
- Two or more

Note 1:
The bending radius of the motor cable should be R 27.6mm (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.