STEPPER SYSTEMS

PACIFIC SCIENTIFIC N&K-SERIES NEMA 34 HIGH TORQUE MOTORS

Features

With holding torques to 5700 oz-in (356 lb-in), the N and K Series provide the highest torques per frame size in the industry—more than 3 and 5 phase designs.

Improved torque linearity (above rated current) provides high peak torque capability (duty cycle dependent, contact factory).

High torque at moderate speeds

Low detent torque harmonic

K Series uses Sigmax™ technology to develop 25% more torque than N Series.

Runs cooler than comparable steppers using identical drive parameters.

Special rotor design for high acceleration

Rugged “housingless” square frame

Sealed per IP65

Outer bearing races won’t turn—front locked (in steel insert) and rear held by O-ring.

Extensive selection of shaft configurations, terminations, standard and special windings

Two phase design

Optional encoder mounting provisions

Benefits

Optimized magnetics provide maximum performance in small envelopes, reducing space required for the motor.

Acceleration boost to move loads even faster. Provides more torque for intermittent duty applications.

Cost effective alternative to servo motors

Provides smoother microstepping performance

Select from broad performance range to meet your requirement

Longer, more reliable motor life—backed by a two year warranty

Move/position loads fast

Efficient use of volume for optimal magnetic circuit

For splashproof requirements

Long life bearings—also prevents axial shaft movement for encoder applications

Match your requirements

Compatible with most drivers, smoother microstepping, and lower input power required vs. three phase for same torque

Optimizes control scheme

LEADWIRE HOOKUP MODELS

SPLASHPROOF CONSTRUCTION-TERMINAL BOARD CONNECTIONS

SPLASHPROOF CONSTRUCTION-MS CONNECTOR(S)
PACIFIC SCIENTIFIC N&K-SERIES NEMA 34 HIGH TORQUE MOTORS

Motor parameters and winding data.

### RATINGS AND CHARACTERISTICS

**SEE SYSTEM RECOMMENDATIONS AND DATA ON PAGES 90-91.**

**K SERIES - SIGMAX**

<table>
<thead>
<tr>
<th>Motor Model Number</th>
<th>Parallel</th>
<th>Phase</th>
<th>Voltage</th>
<th>Current/Phase (amps DC)</th>
<th>Resistance (ohms)</th>
<th>Torque (oz-in)</th>
<th>Thermal Resistance (°C/watt)</th>
<th>Inertia (kgm² x 10⁻³)</th>
<th>Net Weight (kg/100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K20-FK-1NS-00</td>
<td>•</td>
<td>4</td>
<td>2180</td>
<td>2.6</td>
<td>0.038</td>
<td>2.6</td>
<td>15.39</td>
<td>5.39</td>
<td></td>
</tr>
<tr>
<td>K20-FK-2NS-00</td>
<td>•</td>
<td>4</td>
<td>2340</td>
<td>1.8</td>
<td>0.046</td>
<td>2.6</td>
<td>(15.1)</td>
<td>(11.9)</td>
<td></td>
</tr>
<tr>
<td>K20-FK-3NS-00</td>
<td>•</td>
<td>4</td>
<td>1780</td>
<td>2.0</td>
<td>0.055</td>
<td>2.6</td>
<td>3.3</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>K20-FK-4NS-00</td>
<td>•</td>
<td>4</td>
<td>1305</td>
<td>2.0</td>
<td>0.077</td>
<td>2.6</td>
<td>(3.3)</td>
<td>(15.1)</td>
<td></td>
</tr>
</tbody>
</table>

**N SERIES - Standard 1 ROTOR STACK**

<table>
<thead>
<tr>
<th>Motor Model Number</th>
<th>Parallel</th>
<th>Phase</th>
<th>Voltage</th>
<th>Current/Phase (amps DC)</th>
<th>Resistance (ohms)</th>
<th>Torque (oz-in)</th>
<th>Thermal Resistance (°C/watt)</th>
<th>Inertia (kgm² x 10⁻³)</th>
<th>Net Weight (kg/100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N20-FK-1NS-00</td>
<td>•</td>
<td>4</td>
<td>1215</td>
<td>2.6</td>
<td>0.038</td>
<td>2.6</td>
<td>(11.1)</td>
<td>(11.1)</td>
<td></td>
</tr>
<tr>
<td>N20-FK-2NS-00</td>
<td>•</td>
<td>4</td>
<td>2340</td>
<td>1.8</td>
<td>0.046</td>
<td>2.6</td>
<td>(15.1)</td>
<td>(11.9)</td>
<td></td>
</tr>
<tr>
<td>N20-FK-3NS-00</td>
<td>•</td>
<td>4</td>
<td>1780</td>
<td>2.0</td>
<td>0.055</td>
<td>2.6</td>
<td>3.3</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>N20-FK-4NS-00</td>
<td>•</td>
<td>4</td>
<td>1305</td>
<td>2.0</td>
<td>0.077</td>
<td>2.6</td>
<td>(3.3)</td>
<td>(15.1)</td>
<td></td>
</tr>
</tbody>
</table>

**K SERIES - SIGMAX**

<table>
<thead>
<tr>
<th>Motor Model Number</th>
<th>Parallel</th>
<th>Phase</th>
<th>Voltage</th>
<th>Current/Phase (amps DC)</th>
<th>Resistance (ohms)</th>
<th>Torque (oz-in)</th>
<th>Thermal Resistance (°C/watt)</th>
<th>Inertia (kgm² x 10⁻³)</th>
<th>Net Weight (kg/100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K20-FK-1NS-00</td>
<td>•</td>
<td>4</td>
<td>2180</td>
<td>2.6</td>
<td>0.038</td>
<td>2.6</td>
<td>15.39</td>
<td>5.39</td>
<td></td>
</tr>
<tr>
<td>K20-FK-2NS-00</td>
<td>•</td>
<td>4</td>
<td>2340</td>
<td>1.8</td>
<td>0.046</td>
<td>2.6</td>
<td>(15.1)</td>
<td>(11.9)</td>
<td></td>
</tr>
<tr>
<td>K20-FK-3NS-00</td>
<td>•</td>
<td>4</td>
<td>1780</td>
<td>2.0</td>
<td>0.055</td>
<td>2.6</td>
<td>3.3</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>K20-FK-4NS-00</td>
<td>•</td>
<td>4</td>
<td>1305</td>
<td>2.0</td>
<td>0.077</td>
<td>2.6</td>
<td>(3.3)</td>
<td>(15.1)</td>
<td></td>
</tr>
</tbody>
</table>

All ratings typical and at 25°C unless otherwise noted.

- Refer to Selection Guide for more information.
- With rated current applied.
- Motor hung in still air (unmounted).
- Windings at 130°C and motor in still air at 40°C (without heat sink). Operation of these motors above rated current may cause demagnetization. Contact factory.
- Small signal inductance as measured with impedance bridge at 1kHz, 1 amp.
- Thermal resistance measured with motor hanging in still air (unmounted).
The performance information shown in the torque/speed curves that follow show the N & K series of NEMA 34 step motors with windings, connections and current levels selected for maximum performance with the drives shown on this page. For additional assistance in sizing or selecting the stepper system appropriate for your application, contact Danaher Motion Customer Support at 815-226-2222.

6210/6215 Microstepping Drives SEE PAGE 74
- 24-40 VDC input
- Step/direction input or oscillator models
- Current selectable from 1 to 3.5 amps peak
- Microstepping - 4 step sizes

6410/6415 Microstepping Drives SEE PAGE 72
- 24-75 VDC input
- Step/direction input or oscillator models
- Current selectable from 0.625 to 7.1 amps peak
- Selectable step sizes, binary or decimal, full to 1/250 or 1/256

Impulse Microstepping Drives SEE PAGE 75
- 90-120 VAC input, 160 VDC bus
- Step/direction input
- Programmable inputs/outputs
- Current selectable from 0.75 to 4.0 amps
- Microstepping 200 to 100,000, selectable in increments of 200

NextStep® Microstepping Drives SEE PAGE 76
- 90-120 VAC input, 160 VDC bus. 240 V model available
- Step/direction input
- Current selectable from 0 to 7.9 amps, to 3.9 A for 240 V model
- 5,000 steps/rev to 50,000 steps/rev microstepping

SMARTSTEP Microstepping Drives SEE PAGE 77
- 90-120 VAC input, 160 VDC bus. 240 V model available
- Programmable indexing
- Current selectable from 0 to 7.9 amps, to 3.9 A for 240 V model
- 36,000 steps/rev microstepping

SMARTSTEP Microstepping Drives SEE PAGE 77
- 90-120 VAC input, 160 VDC bus. 240 V model available
- Programmable indexing
- Current selectable from 0 to 7.9 amps, to 3.9 A for 240 V model
- 36,000 steps/rev microstepping
PACIFIC SCIENTIFIC N&K-SERIES NEMA 34 STEPPER SYSTEMS

<table>
<thead>
<tr>
<th>72 volt</th>
<th>180 volt</th>
<th>320 volt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Torque (oz-in)</strong></td>
<td><strong>Torque (oz-in)</strong></td>
<td><strong>Torque (oz-in)</strong></td>
</tr>
<tr>
<td>1000</td>
<td>1200</td>
<td>1400</td>
</tr>
<tr>
<td>1600</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Torque (Ncm)</strong></td>
<td><strong>Torque (Ncm)</strong></td>
<td><strong>Torque (Ncm)</strong></td>
</tr>
<tr>
<td>100</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>400</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td><strong>Speed (Full Step/sec)</strong></td>
<td><strong>Speed (Full Step/sec)</strong></td>
<td><strong>Speed (Full Step/sec)</strong></td>
</tr>
<tr>
<td>0</td>
<td>600</td>
<td>1200</td>
</tr>
<tr>
<td>1800</td>
<td>2400</td>
<td>3000</td>
</tr>
<tr>
<td><strong>Speed (rpm)</strong></td>
<td><strong>Speed (rpm)</strong></td>
<td><strong>Speed (rpm)</strong></td>
</tr>
<tr>
<td>0</td>
<td>600</td>
<td>1200</td>
</tr>
<tr>
<td>1800</td>
<td>2400</td>
<td>3000</td>
</tr>
</tbody>
</table>

N34, J  Parallel - 5 A RMS
K34, J  Parallel - 5 A RMS
N31, L  Series - 4 A RMS
K31, L  Series - 4 A RMS
N31, K  Series - 2.83 A RMS
K31, H  Parallel - 2.12 A RMS
N32, M  Series - 5 A RMS
N32, M  Series - 5 A RMS
N32, L  Series - 5 A RMS
K32, M  Series - 5 A RMS
N32, J  Parallel - 5 A RMS
K32, J  Parallel - 5 A RMS
N31, M  Series - 2.83 A RMS
K31, M  Series - 2.83 A RMS
N31, K  Series - 2.83 A RMS
K31, K  Series - 2.83 A RMS
N31, H  Parallel - 2.12 A RMS
K31, H  Parallel - 2.12 A RMS
N31, L  Series - 2.83 A RMS
K31, L  Series - 2.83 A RMS
N31, J  Parallel - 2.83 A RMS
K31, J  Parallel - 2.83 A RMS
N32, J  Series - 2.83 A RMS
K32, J  Series - 2.83 A RMS
N32, K  Series - 2.83 A RMS
K32, K  Series - 2.83 A RMS
N32, H  Parallel - 2.12 A RMS
K32, H  Parallel - 2.12 A RMS
N32, L  Series - 2.83 A RMS
K32, L  Series - 2.83 A RMS
N32, J  Parallel - 2.83 A RMS
K32, J  Parallel - 2.83 A RMS
N33, J  Series - 2.83 A RMS
K33, J  Series - 2.83 A RMS
N33, K  Series - 2.83 A RMS
K33, K  Series - 2.83 A RMS
N33, H  Parallel - 2.12 A RMS
K33, H  Parallel - 2.12 A RMS
N33, L  Series - 2.83 A RMS
K33, L  Series - 2.83 A RMS
N33, J  Parallel - 2.83 A RMS
K33, J  Parallel - 2.83 A RMS
N34, J  Series - 2.83 A RMS
K34, J  Series - 2.83 A RMS
N34, K  Series - 2.83 A RMS
K34, K  Series - 2.83 A RMS
N34, L  Series - 2.83 A RMS
K34, L  Series - 2.83 A RMS
N34, J  Parallel - 2.83 A RMS
K34, J  Parallel - 2.83 A RMS

91