

BN12 IP65 Specifications

Inside Rotor
Brushless Motors

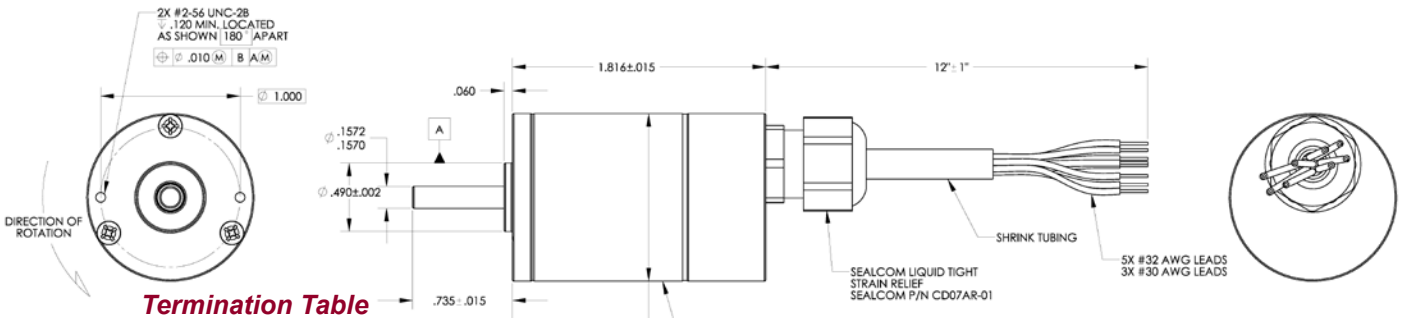
BN12 IP65 SPECIFICATIONS - Continuous Stall Torque 2.4 - 8.6 oz-in (0.0170 - 0.0607 Nm)
Peak Torque 13 - 77 oz-in (0.0918 - 0.5437 Nm)

| Part Number* | | BN12-13IP- <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> | | | BN12-18IP- <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> | | | BN12-23IP- <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> | | | BN12-28IP- <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | | |
|--------------------------|--|---|---------|---------|---|---------|---------|---|---------|---------|--|---------|---------|
| Winding Code** | | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 |
| L = Length | inches | 1.82 | | | 2.32 | | | 2.82 | | | 3.32 | | |
| | millimeters | 46.2 | | | 58.9 | | | 71.6 | | | 84.3 | | |
| Terminal Voltage | volts DC | 12.0 | 24.0 | 36.0 | 12.0 | 24.0 | 36.0 | 12.0 | 24.0 | 36.0 | 12.0 | 24.0 | 36.0 |
| Peak Torque | oz-in | 13.0 | 13.0 | 14.0 | 37.0 | 37.0 | 39.0 | 58.0 | 58.0 | 61.0 | 77.0 | 77.0 | 72.0 |
| | Nm | 0.0918 | 0.0918 | 0.0989 | 0.2613 | 0.2613 | 0.2754 | 0.4096 | 0.4096 | 0.4308 | 0.5437 | 0.5437 | 0.5084 |
| Continuous Stall Torque | oz-in | 2.4 | 2.4 | 2.4 | 4.9 | 5.0 | 5.0 | 6.9 | 6.9 | 6.9 | 8.3 | 8.6 | 8.6 |
| | Nm | 0.0169 | 0.0169 | 0.0169 | 0.0346 | 0.0353 | 0.0353 | 0.0487 | 0.0487 | 0.0487 | 0.0586 | 0.0607 | 0.0607 |
| Rated Speed | RPM | 13027.0 | 12736.0 | 13753.0 | 11928.0 | 11448.0 | 12320.0 | 10604.0 | 10601.0 | 11489.0 | 11036.0 | 10253.0 | 9529.0 |
| | rad/sec | 1364 | 1334 | 1440 | 1249 | 1199 | 1290 | 1110 | 1110 | 1203 | 1156 | 1074 | 998 |
| Rated Torque | oz-in | 1.8 | 1.8 | 1.8 | 3.5 | 3.6 | 3.5 | 5.0 | 5.0 | 4.7 | 5.4 | 5.9 | 6.2 |
| | Nm | 0.0127 | 0.0127 | 0.0127 | 0.0247 | 0.0254 | 0.0247 | 0.0353 | 0.0353 | 0.0332 | 0.0381 | 0.0417 | 0.0438 |
| Rated Current | Amps | 2.26 | 1.13 | 0.77 | 3.49 | 1.76 | 1.20 | 4.32 | 2.16 | 1.46 | 4.81 | 2.46 | 1.61 |
| Rated Power | watts | 17.3 | 17.0 | 18.3 | 30.9 | 30.5 | 31.9 | 39.2 | 39.2 | 39.9 | 44.1 | 44.7 | 43.7 |
| Torque Sensitivity | oz-in/amp | 1.02 | 2.06 | 2.95 | 1.24 | 2.56 | 3.64 | 1.42 | 2.84 | 4.01 | 1.41 | 2.99 | 4.75 |
| | Nm/amp | 0.0072 | 0.0145 | 0.0208 | 0.0088 | 0.0181 | 0.0257 | 0.0100 | 0.0201 | 0.0283 | 0.0100 | 0.0211 | 0.0335 |
| Back EMF | volts/KRPM | 0.75 | 1.53 | 2.18 | 0.92 | 1.89 | 2.69 | 1.05 | 2.10 | 2.96 | 1.04 | 2.21 | 3.51 |
| | volts/rad/sec | 0.0072 | 0.0145 | 0.0208 | 0.0088 | 0.0181 | 0.0257 | 0.0100 | 0.0201 | 0.0283 | 0.0100 | 0.0211 | 0.0335 |
| Terminal Resistance | ohms | 0.953 | 3.89 | 7.85 | 0.403 | 1.67 | 3.36 | 0.294 | 1.18 | 2.36 | 0.219 | 0.934 | 2.36 |
| Terminal Inductance | mH | 0.254 | 1.100 | 2.210 | 0.181 | 0.742 | 1.460 | 0.172 | 0.692 | 1.374 | 0.128 | 0.447 | 1.220 |
| Motor Constant | oz-in/sq.rt.watt | 1.04 | 1.04 | 1.05 | 1.95 | 1.98 | 1.99 | 2.62 | 2.61 | 2.61 | 3.01 | 3.09 | 3.09 |
| | Nm/sq.rt.watt | 0.00738 | 0.00738 | 0.00744 | 0.01379 | 0.01399 | 0.01402 | 0.01849 | 0.01846 | 0.01843 | 0.02128 | 0.02185 | 0.02183 |
| Rotor Inertia | oz-in-sec ² x10 ⁻³ | 0.040 | 0.040 | 0.040 | 0.080 | 0.080 | 0.080 | 0.120 | 0.120 | 0.120 | 0.16 | 0.16 | 0.16 |
| | g-cm ² | 2.82 | 2.82 | 2.82 | 5.65 | 5.65 | 5.65 | 8.47 | 8.47 | 8.47 | 11.3 | 11.3 | 11.3 |
| Weight | oz | 3.6 | 3.6 | 3.6 | 5.5 | 5.5 | 5.5 | 7.3 | 7.3 | 7.3 | 9.1 | 9.2 | 9.2 |
| | g | 102.2 | 102.2 | 102.2 | 156.2 | 156.2 | 156.2 | 207.3 | 207.3 | 207.3 | 258.4 | 261.3 | 261.3 |
| # of Poles | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Timing | | 120° | 120° | 120° | 120° | 120° | 120° | 120° | 120° | 120° | 120° | 120° | 120° |
| Mech. Time Constant | ms | 5.2 | 5.2 | 5.1 | 3.0 | 2.9 | 2.9 | 2.5 | 2.5 | 2.5 | 2.5 | 2.4 | 2.4 |
| Electrical Time Constant | ms | 0.14 | 0.14 | 0.14 | 0.24 | 0.25 | 0.25 | 0.29 | 0.29 | 0.29 | 0.29 | 0.31 | 0.31 |
| Thermal Resistivity | deg. C/watt | 10.7 | 10.3 | 11.2 | 9.5 | 8.9 | 9.3 | 8.3 | 8.3 | 8.3 | 7.7 | 7.3 | 7.4 |
| Speed/Torque Gradient | rpm/oz-in | 1245.8 | 1234.2 | 1220.6 | 353.3 | 345.2 | 343.2 | 197.2 | 197.9 | 198.8 | 149.3 | 141.3 | 141.6 |

- Notes:
- Motor mounted to a 4 x 4 x 1/4 inches aluminum plate, still air.
 - Maximum winding temperature of 155°C.
 - Typical electrical specifications at 25°C.
 - Motor Terminal Voltages are representative only; motors may be operated at voltages other than those listed in the table. For assistance please contact our applications engineer.
 - Calculated (theoretical) speed/torque gradient.
 - For MS (military style) connector, please specify connector housing and terminal.
 - Data for informational purposes only. Should not be considered a binding performance agreement. For specific applications, please contact the factory.

- *Many other custom mechanical options are available – consult factory.
**Many other winding options are available – consult factory.
- Select your options below and place their code in its corresponding block as shown on page 5.
- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> TERMINATION | <input checked="" type="checkbox"/> FEEDBACK OPTIONS | <input checked="" type="checkbox"/> OTHER OPTIONS |
| L – Leads (std) | H – Hall Effect (std) | D – Drive |
| C – Connector | M – MS connector | G – Gearhead |

BN12 IP65 Typical Outline



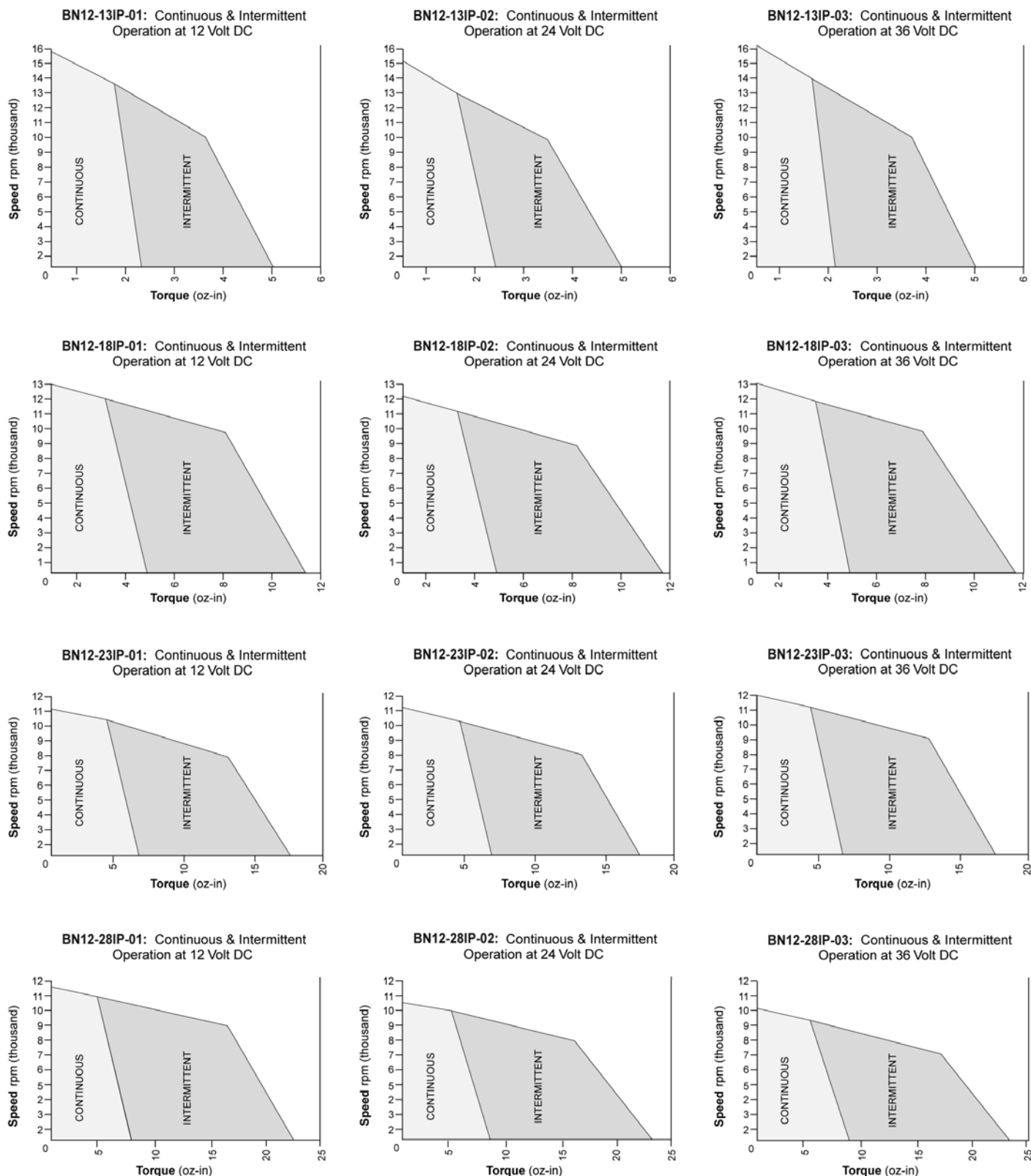
Termination Table

| PIN COLOR | CONNECTION |
|-----------|-----------------|
| YELLOW | V _{CC} |
| GRAY | GROUND |
| RED | A COIL |
| BLACK | B COIL |
| GREEN | C COIL |
| BLUE | S2 OUT |
| BROWN | S1 OUT |
| ORANGE | S3 OUT |

Dimensions are in inches

BN12 IP65 Performance Curves

BN12 IP65 Performance Curves



Note: Intermittent operation is based on a 20% duty cycle of one minute on, four minutes off.
Please contact the factory regarding the duty cycle of your application.