# BN23 SPECIFICATIONS

## Continuous Stall Torque 14.6 - 54.3 oz-in (0.103 - 0.384 Nm) / Peak Torque 35 - 186 oz-in (0.2472 - 1.3134 Nm)

| Part Number* | | BN23-13MG-□□ T F O | | | BN23-18MG-□□ T F O | | | BN23-23MG-□□ T F O | | | BN23-28MG-□□ T F O | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Winding Code** | | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 |
| L = Length | inches | 1.40 | | | 1.90 | | | 2.40 | | | 2.90 | | |
| | millimeters | 35.6 | | | 48.3 | | | 60.9 | | | 73.7 | | |
| Terminal Voltage | volts DC | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 |
| Peak Torque | oz-in | 35 | 35 | 35 | 88 | 88 | 88 | 143 | 143 | 143 | 186 | 186 | 186 |
| | Nm | 0.2472 | 0.2472 | 0.2472 | 0.6214 | 0.6214 | 0.6214 | 1.0098 | 1.0098 | 1.0098 | 1.3134 | 1.3134 | 1.3134 |
| Continuous Stall Torque | oz-in | 14.6 | 17.7 | 14.2 | 30.7 | 31.4 | 35.2 | 42.8 | 44.7 | 42.9 | 50.4 | 54.3 | 53.2 |
| | Nm | 0.103 | 0.125 | 0.100 | 0.217 | 0.221 | 0.248 | 0.303 | 0.315 | 0.303 | 0.356 | 0.384 | 0.376 |
| No-Load Speed | | 12,200 | 12,500 | 12,300 | 9,100 | 9,700 | 10,200 | 8,100 | 8,800 | 8,200 | 7,300 | 7,500 | 8,100 |
| Rated Speed | RPM | 8650 | 9060 | 9190 | 6460 | 7000 | 7130 | 6060 | 6700 | 6250 | 5340 | 5590 | 6140 |
| | rad/sec | 906 | 949 | 962 | 676 | 733 | 747 | 635 | 702 | 655 | 559 | 585 | 643 |
| Rated Torque | oz-in | 14.2 | 16.1 | 12.1 | 29.7 | 29.8 | 32.9 | 40.3 | 42.3 | 41.8 | 49.1 | 51.9 | 48.8 |
| | Nm | 0.100 | 0.114 | 0.085 | 0.210 | 0.210 | 0.232 | 0.285 | 0.299 | 0.295 | 0.347 | 0.366 | 0.345 |
| Rated Current | Amps | 5.80 | 4.30 | 2.38 | 7.75 | 5.43 | 4.88 | 9.47 | 7.44 | 5.00 | 10.45 | 7.66 | 5.85 |
| Rated Power | watts | 91 | 108 | 82 | 142 | 154 | 174 | 181 | 210 | 193 | 194 | 215 | 222 |
| Torque Sensitivity | oz-in/amp | 2.55 | 3.78 | 5.18 | 3.40 | 4.90 | 6.25 | 3.85 | 5.35 | 7.79 | 4.26 | 6.30 | 7.80 |
| | Nm/amp | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Back EMF | volts/KRPM | 1.89 | 2.80 | 3.83 | 2.51 | 3.62 | 4.62 | 2.85 | 3.96 | 5.76 | 3.15 | 4.66 | 5.77 |
| | volts/rad/sec | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Terminal Resistance | ohms | 0.465 | 0.939 | 1.890 | 0.246 | 0.507 | 0.800 | 0.178 | 0.347 | 0.715 | 0.181 | 0.366 | 0.576 |
| Terminal Inductance | mH | 0.350 | 0.758 | 1.53 | 0.275 | 0.580 | 0.930 | 0.220 | 0.420 | 0.900 | 0.230 | 0.490 | 0.770 |
| Motor Constant | oz-in/sq.rt.watt | 3.74 | 3.90 | 3.77 | 6.86 | 6.88 | 6.99 | 9.13 | 9.08 | 9.21 | 10.01 | 10.41 | 10.28 |
| | Nm/sq.rt.watt | 0.026 | 0.028 | 0.027 | 0.048 | 0.049 | 0.049 | 0.064 | 0.064 | 0.065 | 0.071 | 0.074 | 0.073 |
| Rotor Inertia | oz-in-sec$^2$x10$^{-3}$ | 0.51 | 0.51 | 0.51 | 0.99 | 0.99 | 0.99 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 |
| | g-cm$^2$ | 36 | 36 | 36 | 70 | 70 | 70 | 106 | 106 | 106 | 134 | 134 | 134 |
| Weight | oz | 8.3 | 8.4 | 8.3 | 13.6 | 13.7 | 13.8 | 19.1 | 19.1 | 19.1 | 24.4 | 24.7 | 24.5 |
| | g | 234.0 | 238.0 | 234.0 | 386.0 | 389.0 | 391.0 | 542.0 | 542.0 | 542.0 | 693.0 | 699.0 | 694.0 |
| # 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 | 5.20 | 4.7 | 5.1 | 3.0 | 3.0 | 2.9 | 2.5 | 2.6 | 2.5 | 2.7 | 2.5 | 2.5 |
| Electrical Time Constant | ms | 0.75 | 0.81 | 0.81 | 1.12 | 1.14 | 1.16 | 1.24 | 1.21 | 1.26 | 1.27 | 1.34 | 1.34 |
| Thermal Resistivity | deg. C/watt | 2.28 | 2.34 | 3.44 | 2.49 | 2.67 | 1.81 | 2.36 | 1.89 | 2.35 | 1.93 | 1.80 | 1.86 |
| Speed/Torque Gradient | rpm/oz-in | 250.0 | 213.7 | 257.0 | 88.9 | 90.6 | 93.3 | 50.6 | 49.6 | 46.7 | 39.9 | 36.8 | 40.2 |

Notes:
1. Motor mounted to a 6 x 6 x 1/4 inches aluminum plate, still air.
2. Maximum winding temperature of 155°C.
3. Typical electrical specifications at 25°C.
4. Data shown for 8 pole motors. Please consult factory for 4 pole specifications.
5. 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.
6. For MS (military style) connector, please specify connector housing and terminal.
7. 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.

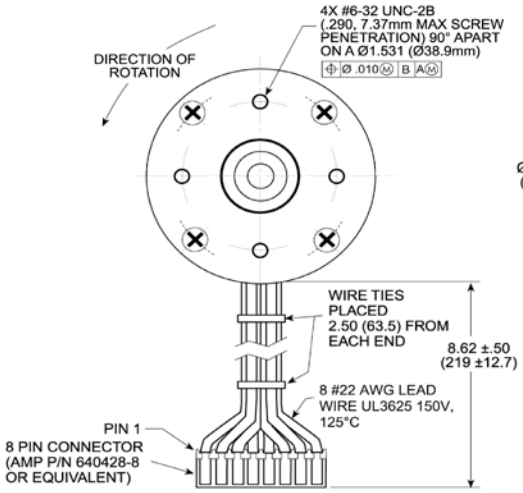
Select your options below and place their code in its corresponding block as shown on page 4.

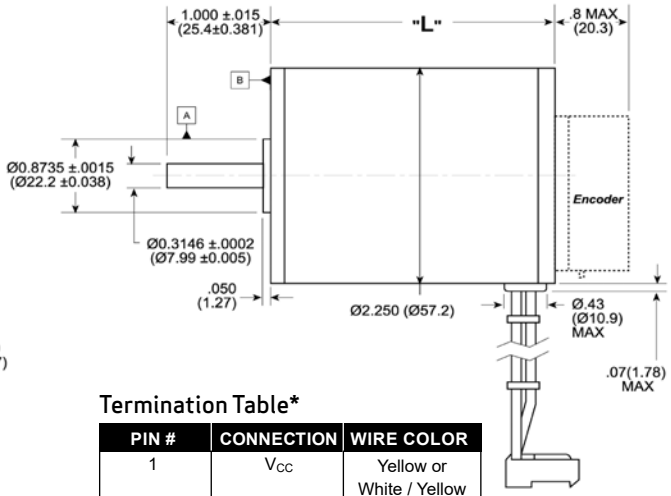
**T Termination**
L – Leads (std)
C – Connector
M – MS connector

**F Feedback Options**
H – Hall Effect (std)
R – Resolver
S – Sensorless

**O Other Options**
E – Encoder
G – Gearhead

# BN23 TYPICAL OUTLINE - HOUSED



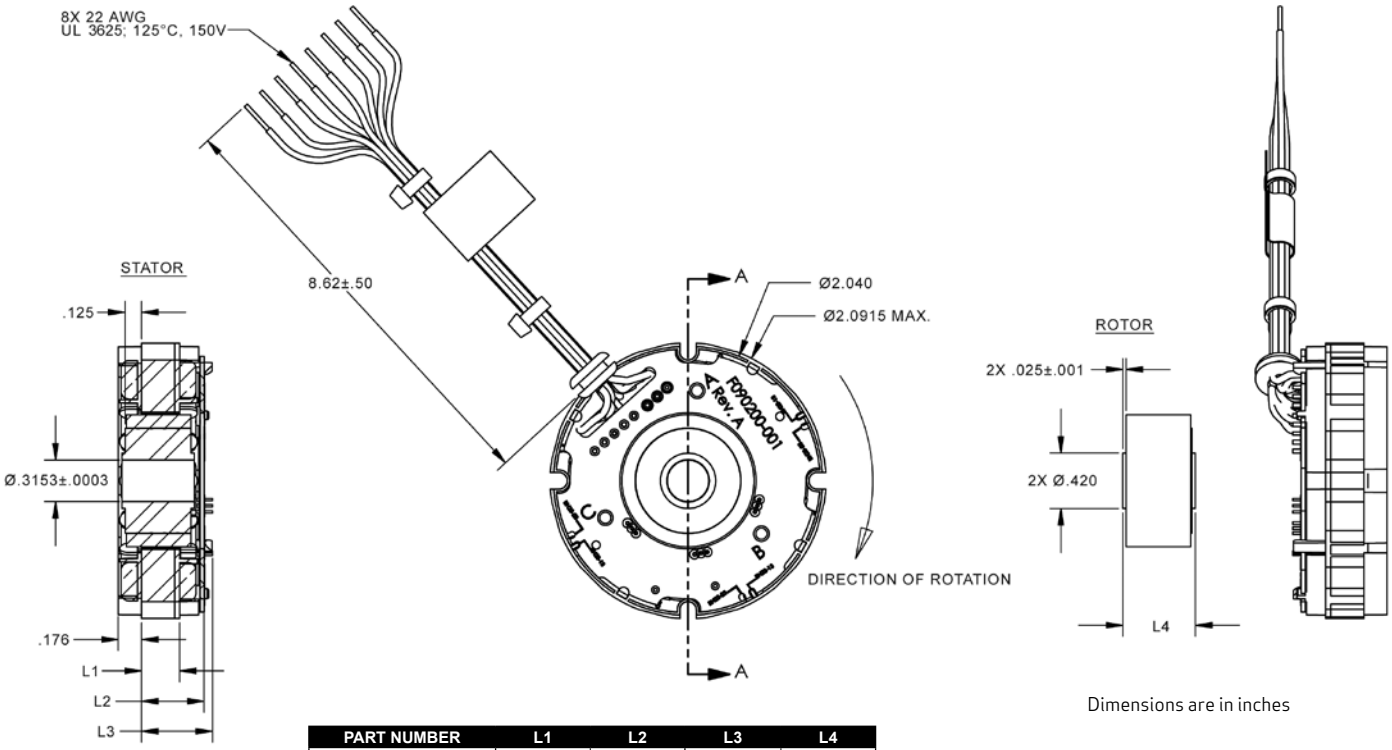

### Termination Table*

| PIN # | CONNECTION | WIRE COLOR |
|---|---|---|
| 1 | $V_{CC}$ | Yellow or White / Yellow |
| 2 | GROUND | White / Gray |
| 3 | A COIL | White / Violet |
| 4 | B COIL | White / Black |
| 5 | C COIL | Green |
| 6 | S2 OUT | White / Blue |
| 7 | S1 OUT | White / Brown |
| 8 | S3 OUT | White |

Dimensions are in inches (millimeters)

**We reserve the right to use solid color wires or white wires with color trace.*

# BN23 TYPICAL OUTLINE - FRAMELESS



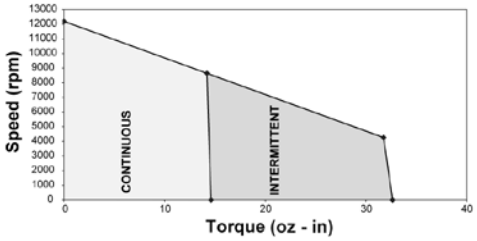

Dimensions are in inches

| PART NUMBER | L1 | L2 | L3 | L4 |
|---|---|---|---|---|
| BN23-13ZMG-XXLH | 0.288 | 0.474 | 0.550 | 0.550 |
| BN23-18ZMG-XXLH | 0.788 | 0.974 | 1.050 | 1.050 |
| BN23-23ZMG-XXLH | 1.288 | 1.470 | 1.550 | 1.550 |
| BN23-28ZMG-XXLH | 1.788 | 1.970 | 2.050 | 2.050 |

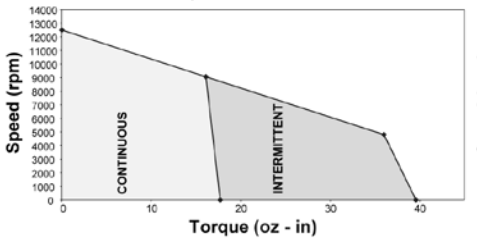
**Note:** For electrical performance see page 17.

# BN23 PERFORMANCE CURVES

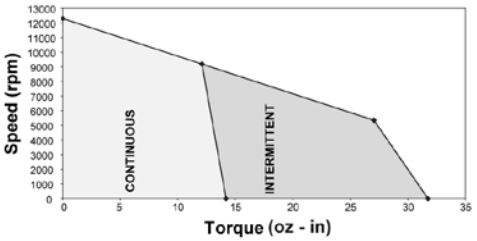
**BN23-13MG-01:** Continuous & Intermittent Operation at 24 VDC



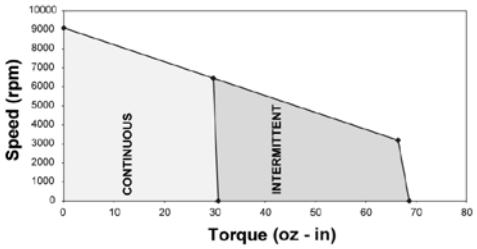

**BN23-13MG-02:** Continuous & Intermittent Operation at 36VDC



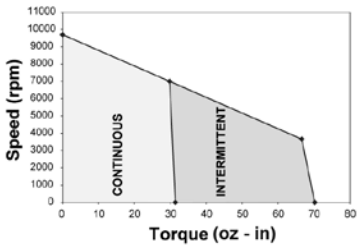

**BN23-13MG-03:** Continuous & Intermittent Operation at 48 VDC



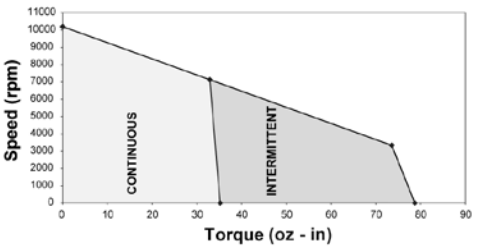

**BN23-18MG-01:** Continuous & Intermittent Operation at 24 VDC



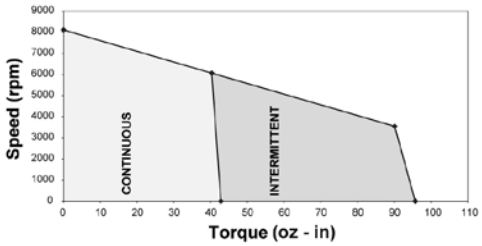

**BN23-18MG-02:** Continuous & Intermittent Operation at 36 VDC



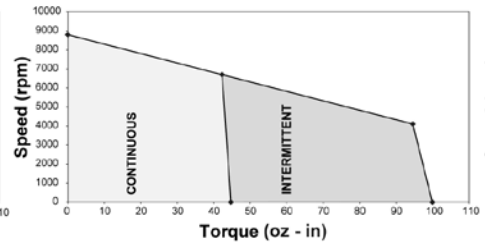

**BN23-18MG-03:** Continuous & Intermittent Operation at 48 VDC



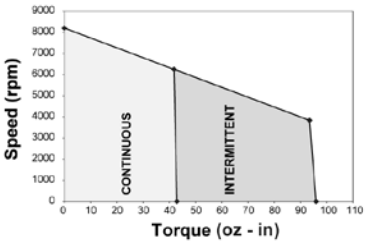

**BN23-23MG-01:** Continuous & Intermittent Operation at 24 VDC



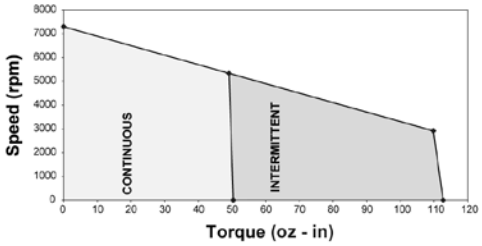

**BN23-23MG-02:** Continuous & Intermittent Operation at 36 VDC



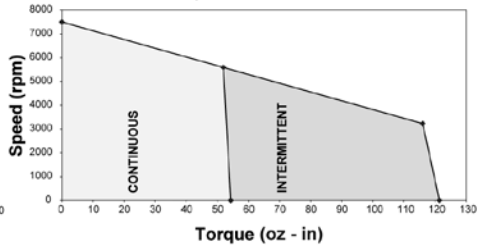

**BN23-23MG-03:** Continuous & Intermittent Operation at 48 VDC



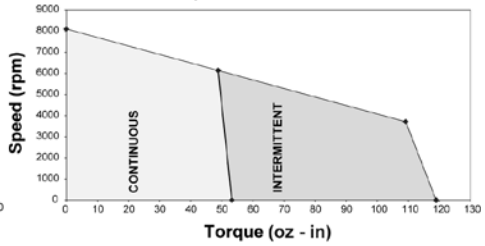

**BN23-28MG-01:** Continuous & Intermittent Operation at 24 VDC




**BN23-28MG-02:** Continuous & Intermittent Operation at 36 VDC




**BN23-28MG-03:** Continuous & Intermittent Operation at 48 VDC




**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.

# BN23 EU SPECIFICATIONS

## Continuous Stall Torque 14.6 - 54.3 oz-in (0.103 - 0.384 Nm) / Peak Torque 35 - 186 oz-in (0.2472 - 1.3134 Nm)

| Part Number* | | BN23-13EU- □□ T F O | | | BN23-18EU- □□ T F O | | | BN23-23EU- □□ T F O | | | BN23-28EU- □□ T F O | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Winding Code** | | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 |
| L = Length | inches | 1.40 | | | 1.90 | | | 2.40 | | | 2.90 | | |
| | millimeters | 35.6 | | | 48.3 | | | 60.9 | | | 73.7 | | |
| Terminal Voltage | volts DC | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 |
| Peak Torque | oz-in | 35 | 35 | 35 | 88 | 88 | 88 | 143 | 143 | 143 | 186 | 186 | 186 |
| | Nm | 0.2472 | 0.2472 | 0.2472 | 0.6214 | 0.6214 | 0.6214 | 1.0098 | 1.0098 | 1.0098 | 1.3134 | 1.3134 | 1.3134 |
| Continuous Stall Torque | oz-in | 14.6 | 17.7 | 14.2 | 30.7 | 31.4 | 35.2 | 42.8 | 44.7 | 42.9 | 50.4 | 54.3 | 53.2 |
| | Nm | 0.103 | 0.125 | 0.100 | 0.217 | 0.221 | 0.248 | 0.303 | 0.315 | 0.303 | 0.356 | 0.384 | 0.376 |
| No-Load Speed | | 12,200 | 12,500 | 12,300 | 9,100 | 9,700 | 10,200 | 8,100 | 8,800 | 8,200 | 7,300 | 7,500 | 8,100 |
| Rated Speed | RPM | 8650 | 9060 | 9190 | 6460 | 7000 | 7130 | 6060 | 6700 | 6250 | 5340 | 5590 | 6140 |
| | rad/sec | 906 | 949 | 962 | 676 | 733 | 747 | 635 | 702 | 655 | 559 | 585 | 643 |
| Rated Torque | oz-in | 14.2 | 16.1 | 12.1 | 29.7 | 29.8 | 32.9 | 40.3 | 42.3 | 41.8 | 49.1 | 51.9 | 48.8 |
| | Nm | 0.100 | 0.114 | 0.085 | 0.210 | 0.210 | 0.232 | 0.285 | 0.299 | 0.295 | 0.347 | 0.366 | 0.345 |
| Rated Current | Amps | 5.80 | 4.30 | 2.38 | 7.75 | 5.43 | 4.88 | 9.47 | 7.44 | 5.00 | 10.45 | 7.66 | 5.85 |
| Rated Power | watts | 91 | 108 | 82 | 142 | 154 | 174 | 181 | 210 | 193 | 194 | 215 | 222 |
| Torque Sensitivity | oz-in/amp | 2.55 | 3.78 | 5.18 | 3.40 | 4.90 | 6.25 | 3.85 | 5.35 | 7.79 | 4.26 | 6.30 | 7.80 |
| | Nm/amp | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Back EMF | volts/KRPM | 1.89 | 2.80 | 3.83 | 2.51 | 3.62 | 4.62 | 2.85 | 3.96 | 5.76 | 3.15 | 4.66 | 5.77 |
| | volts/rad/sec | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Terminal Resistance | ohms | 0.465 | 0.939 | 1.890 | 0.246 | 0.507 | 0.800 | 0.178 | 0.347 | 0.715 | 0.181 | 0.366 | 0.576 |
| Terminal Inductance | mH | 0.350 | 0.758 | 1.53 | 0.275 | 0.580 | 0.930 | 0.220 | 0.420 | 0.900 | 0.230 | 0.490 | 0.770 |
| Motor Constant | oz-in/sq.rt.watt | 3.74 | 3.90 | 3.77 | 6.86 | 6.88 | 6.99 | 9.13 | 9.08 | 9.21 | 10.01 | 10.41 | 10.28 |
| | Nm/sq.rt.watt | 0.026 | 0.028 | 0.027 | 0.048 | 0.049 | 0.049 | 0.064 | 0.064 | 0.065 | 0.071 | 0.074 | 0.073 |
| Rotor Inertia | oz-in-sec$^2$x10$^{-3}$ | 0.51 | 0.51 | 0.51 | 0.99 | 0.99 | 0.99 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 |
| | g-cm$^2$ | 36 | 36 | 36 | 70 | 70 | 70 | 106 | 106 | 106 | 134 | 134 | 134 |
| Weight | oz | 8.3 | 8.4 | 8.3 | 13.6 | 13.7 | 13.8 | 19.1 | 19.1 | 19.1 | 24.4 | 24.7 | 24.5 |
| | g | 234.0 | 238.0 | 234.0 | 386.0 | 389.0 | 391.0 | 542.0 | 542.0 | 542.0 | 693.0 | 699.0 | 694.0 |
| # 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 | 5.20 | 4.7 | 5.1 | 3.0 | 3.0 | 2.9 | 2.5 | 2.6 | 2.5 | 2.7 | 2.5 | 2.5 |
| Electrical Time Constant | ms | 0.75 | 0.81 | 0.81 | 1.12 | 1.14 | 1.16 | 1.24 | 1.21 | 1.26 | 1.27 | 1.34 | 1.34 |
| Thermal Resistivity | deg. C/watt | 2.28 | 2.34 | 3.44 | 2.49 | 2.67 | 1.81 | 2.36 | 1.89 | 2.35 | 1.93 | 1.80 | 1.86 |
| Speed/Torque Gradient | rpm/oz-in | 250.0 | 213.7 | 257.0 | 88.9 | 90.6 | 93.3 | 50.6 | 49.6 | 46.7 | 39.9 | 36.8 | 40.2 |

Notes:
1. Motor mounted to a 6" x 6" x 1/4" aluminum plate, still air.
2. Maximum winding temperature of 155°C.
3. Typical electrical specifications at 25°C.
4. Data shown for 8 pole motors. Please consult factory for 4 pole specifications.
5. 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.
6. For MS (military style) connector, please specify connector housing and terminal.
7. 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 4.

**T Termination**
L – Leads (std)
C – Connector
M – MS connector

**F Feedback Options**
H – Hall Effect (std)
R – Resolver
S – Sensorless

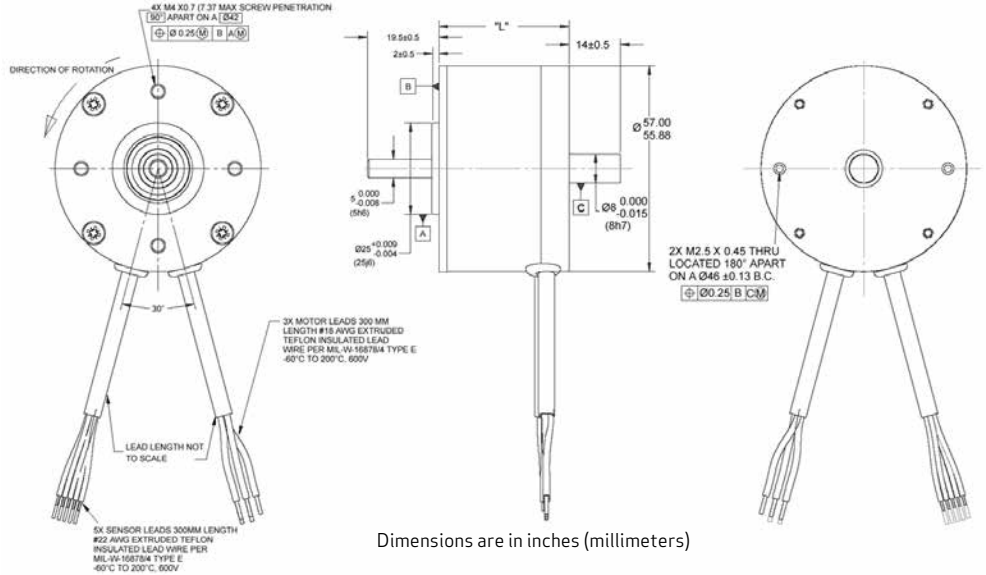
**O Other Options**
E – Encoder
G – Gearhead

# BN23 EU TYPICAL OUTLINE

### Termination Table*

| COLOR | CONNECTION |
|---|---|
| VIOLET | A COIL |
| GREEN | C COIL |
| BLACK | B COIL |
| GRAY | HALL GND |
| YELLOW | HALL $V_{CC}$ |
| WHITE | HALL S3 |
| BLUE | HALL S2 |
| BROWN | HALL S1 |

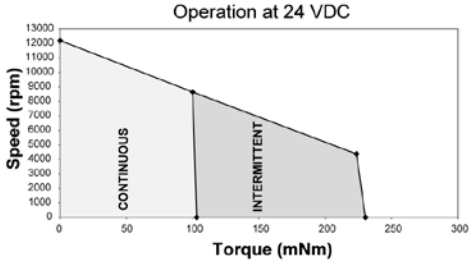
**We reserve the right to use solid color wires or white wires with color trace.*



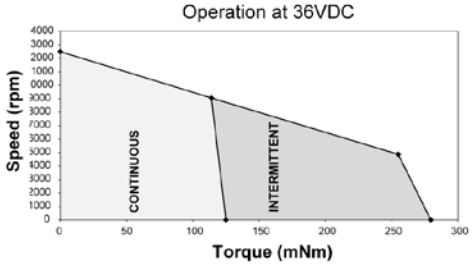

Dimensions are in inches (millimeters)

# BN23 EU PERFORMANCE CURVES

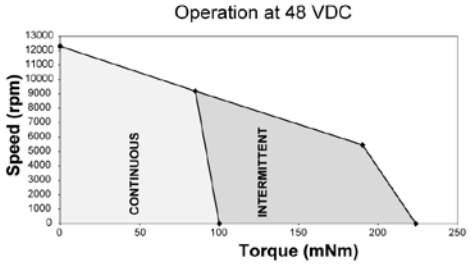
**BN23-13EU-01:** Continuous & Intermittent Operation at 24 VDC



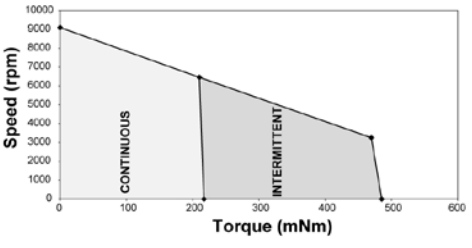

**BN23-13EU-02:** Continuous & Intermittent Operation at 36VDC



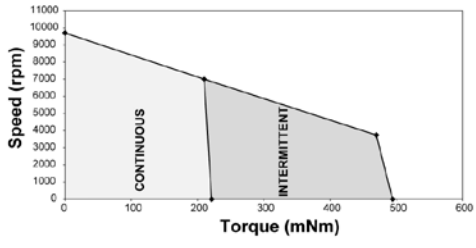

**BN23-13EU-03:** Continuous & Intermittent Operation at 48 VDC



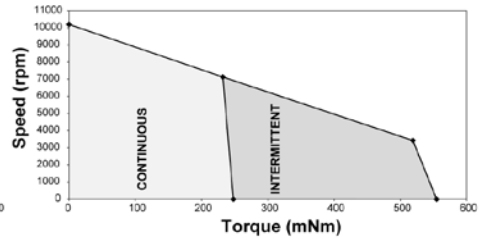

**BN23-18EU-01:** Continuous & Intermittent Operation at 24 VDC



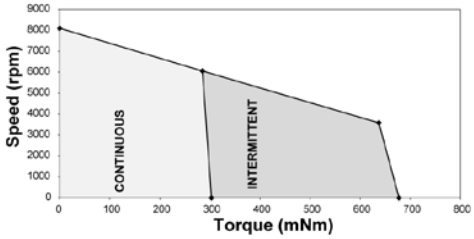

**BN23-18EU-02:** Continuous & Intermittent Operation at 36 VDC



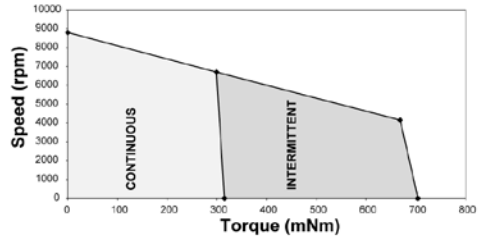

**BN23-18EU-03:** Continuous & Intermittent Operation at 48 VDC



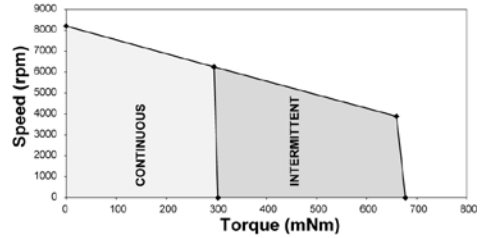

**BN23-23EU-01:** Continuous & Intermittent Operation at 24 VDC



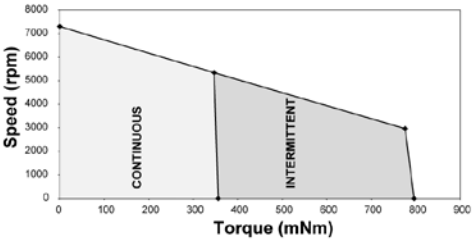

**BN23-23EU-02:** Continuous & Intermittent Operation at 36 VDC



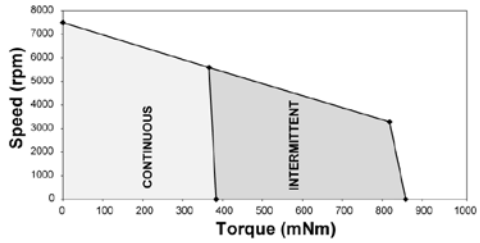

**BN23-23EU-03:** Continuous & Intermittent Operation at 48 VDC



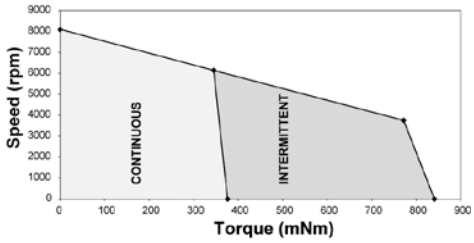

**BN23-28EU-01:** Continuous & Intermittent Operation at 24 VDC




**BN23-28EU-02:** Continuous & Intermittent Operation at 36 VDC




**BN23-28EU-03:** Continuous & Intermittent Operation at 48 VDC




**S/T Gradient = 35.4 rpm/mNm**

**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.

# BN23 IP65 SPECIFICATIONS

## Continuous Stall Torque 12.6 - 41 oz-in (0.0890 - 0.290 Nm) / Peak Torque 35 - 186 oz-in (0.248 - 1.32 Nm)

| Part Number* | | BN23-13IP- □□ T F O | | | BN23-18IP- □□ T F O | | | BN23-23IP- □□ T F O | | | BN23-28IP- □□ T F O | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Winding Code** | | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 | 01 | 02 | 03 |
| L = Length | inches | 2.43 | | | 2.93 | | | 3.43 | | | 3.93 | | |
| | millimeters | 61.72 | | | 74.42 | | | 87.12 | | | 99.82 | | |
| Terminal Voltage | volts DC | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 | 24 | 36 | 48 |
| Peak Torque | oz-in | 35 | 35 | 35 | 88 | 88 | 88 | 143 | 143 | 143 | 186 | 186 | 186 |
| | Nm | 0.2472 | 0.2472 | 0.2472 | 0.6214 | 0.6214 | 0.6214 | 1.0098 | 1.0098 | 1.0098 | 1.3134 | 1.3134 | 1.3134 |
| Continuous Stall Torque | oz-in | 14.6 | 17.7 | 14.2 | 30.7 | 31.4 | 35.2 | 42.8 | 44.7 | 42.9 | 50.4 | 54.3 | 53.2 |
| | Nm | 0.103 | 0.125 | 0.100 | 0.217 | 0.221 | 0.248 | 0.303 | 0.315 | 0.303 | 0.356 | 0.384 | 0.376 |
| No-Load Speed | | 12,200 | 12,500 | 12,300 | 9,100 | 9,700 | 10,200 | 8,100 | 8,800 | 8,200 | 7,300 | 7,500 | 8,100 |
| Rated Speed | RPM | 8650 | 9060 | 9190 | 6460 | 7000 | 7130 | 6060 | 6700 | 6250 | 5340 | 5590 | 6140 |
| | rad/sec | 906 | 949 | 962 | 676 | 733 | 747 | 635 | 702 | 655 | 559 | 585 | 643 |
| Rated Torque | oz-in | 14.2 | 16.1 | 12.1 | 29.7 | 29.8 | 32.9 | 40.3 | 42.3 | 41.8 | 49.1 | 51.9 | 48.8 |
| | Nm | 0.100 | 0.114 | 0.085 | 0.210 | 0.210 | 0.232 | 0.285 | 0.299 | 0.295 | 0.347 | 0.366 | 0.345 |
| Rated Current | Amps | 5.80 | 4.30 | 2.38 | 7.75 | 5.43 | 4.88 | 9.47 | 7.44 | 5.00 | 10.45 | 7.66 | 5.85 |
| Rated Power | watts | 91 | 108 | 82 | 142 | 154 | 174 | 181 | 210 | 193 | 194 | 215 | 222 |
| Torque Sensitivity | oz-in/amp | 2.55 | 3.78 | 5.18 | 3.40 | 4.90 | 6.25 | 3.85 | 5.35 | 7.79 | 4.26 | 6.30 | 7.80 |
| | Nm/amp | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Back EMF | volts/KRPM | 1.89 | 2.80 | 3.83 | 2.51 | 3.62 | 4.62 | 2.85 | 3.96 | 5.76 | 3.15 | 4.66 | 5.77 |
| | volts/rad/sec | 0.018 | 0.027 | 0.037 | 0.024 | 0.035 | 0.044 | 0.027 | 0.038 | 0.055 | 0.030 | 0.044 | 0.055 |
| Terminal Resistance | ohms | 0.465 | 0.939 | 1.890 | 0.246 | 0.507 | 0.800 | 0.178 | 0.347 | 0.715 | 0.181 | 0.366 | 0.576 |
| Terminal Inductance | mH | 0.350 | 0.758 | 1.53 | 0.275 | 0.580 | 0.930 | 0.220 | 0.420 | 0.900 | 0.230 | 0.490 | 0.770 |
| Motor Constant | oz-in/sq.rt.watt | 3.74 | 3.90 | 3.77 | 6.86 | 6.88 | 6.99 | 9.13 | 9.08 | 9.21 | 10.01 | 10.41 | 10.28 |
| | Nm/sq.rt.watt | 0.026 | 0.028 | 0.027 | 0.048 | 0.049 | 0.049 | 0.064 | 0.064 | 0.065 | 0.071 | 0.074 | 0.073 |
| Rotor Inertia | oz-in-sec$^2$x10$^{-3}$ | 0.51 | 0.51 | 0.51 | 0.99 | 0.99 | 0.99 | 1.5 | 1.5 | 1.5 | 1.9 | 1.9 | 1.9 |
| | g-cm$^2$ | 36 | 36 | 36 | 70 | 70 | 70 | 106 | 106 | 106 | 134 | 134 | 134 |
| Weight | oz | 8.3 | 8.4 | 8.3 | 13.6 | 13.7 | 13.8 | 19.1 | 19.1 | 19.1 | 24.4 | 24.7 | 24.5 |
| | g | 234.0 | 238.0 | 234.0 | 386.0 | 389.0 | 391.0 | 542.0 | 542.0 | 542.0 | 693.0 | 699.0 | 694.0 |
| # 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 | 5.20 | 4.7 | 5.1 | 3.0 | 3.0 | 2.9 | 2.5 | 2.6 | 2.5 | 2.7 | 2.5 | 2.5 |
| Electrical Time Constant | ms | 0.75 | 0.81 | 0.81 | 1.12 | 1.14 | 1.16 | 1.24 | 1.21 | 1.26 | 1.27 | 1.34 | 1.34 |
| Thermal Resistivity | deg. C/watt | 2.28 | 2.34 | 3.44 | 2.49 | 2.67 | 1.81 | 2.36 | 1.89 | 2.35 | 1.93 | 1.80 | 1.86 |
| Speed/Torque Gradient | rpm/oz-in | 250.0 | 213.7 | 257.0 | 88.9 | 90.6 | 93.3 | 50.6 | 49.6 | 46.7 | 39.9 | 36.8 | 40.2 |

Notes:
1. Motor mounted to a 6" x 6" x 1/4" aluminum plate, still air.
2. Maximum winding temperature of 155°C.
3. Typical electrical specifications at 25°C.
4. 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.
5. Calculated (theoretical) speed/torque gradient.
6. For MS (military style) connector, please specify connector housing and terminal.
7. 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.

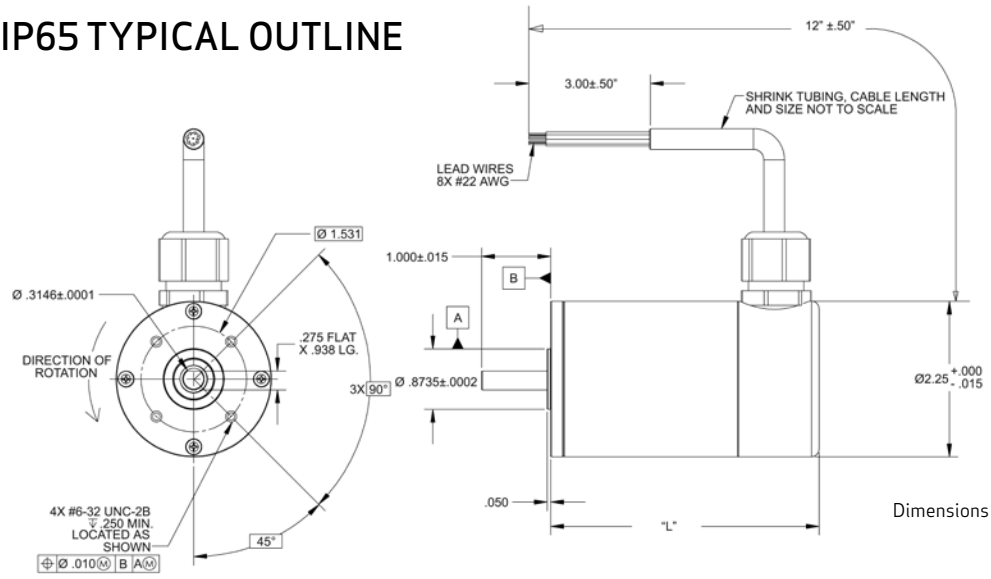
Select your options below and place their code in its corresponding block as shown on page 4.

**T Termination**
– Leads (std)
C – Connector
M – MS connector

**F Feedback Options**
H – Hall Effect (std)

**O Other Options**
G – Gearhead

# BN23 IP65 TYPICAL OUTLINE




Dimensions are in inches

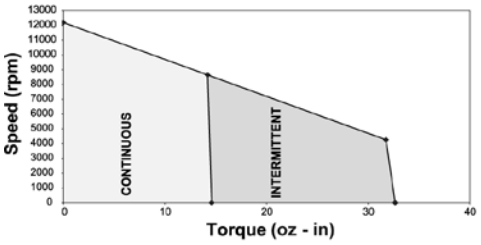
### Termination Table*

| COLOR | CONNECTION |
|---|---|
| VIOLET | A COIL |
| GREEN | C COIL |
| BLACK | B COIL |
| GRAY | HALL GND |
| YELLOW | HALL $V_{CC}$ |
| WHITE | HALL S3 |
| BLUE | HALL S2 |
| BROWN | HALL S1 |

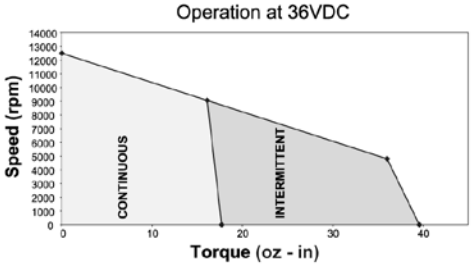
*We reserve the right to use solid color wires or white wires with color trace.*

# BN23 IP65 PERFORMANCE CURVES

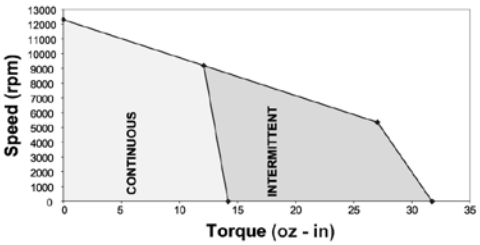
**BN23-13IP-01:** Continuous & Intermittent Operation at 24 VDC



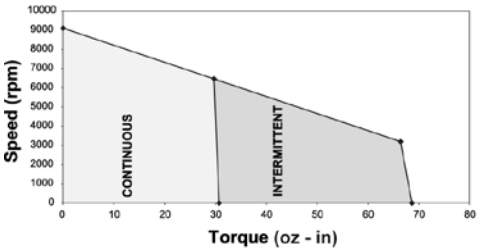

**BN23-13IP-02:** Continuous & Intermittent Operation at 36VDC



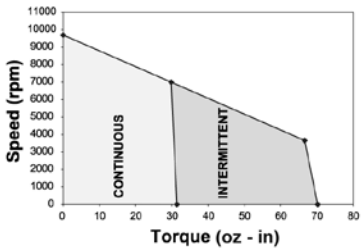

**BN23-13IP-03:** Continuous & Intermittent Operation at 48 VDC



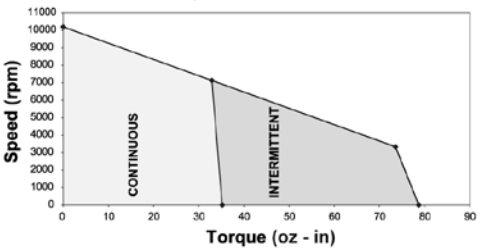

**BN23-18IP-01:** Continuous & Intermittent Operation at 24 VDC



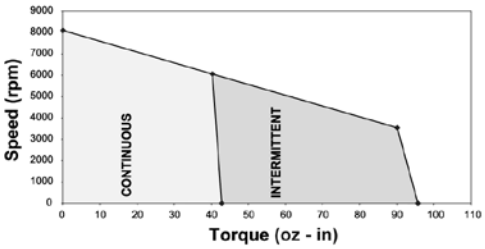

**BN23-18IP-02:** Continuous & Intermittent Operation at 36 VDC



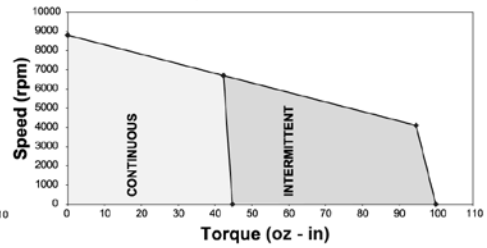

**BN23-18IP-03:** Continuous & Intermittent Operation at 48 VDC



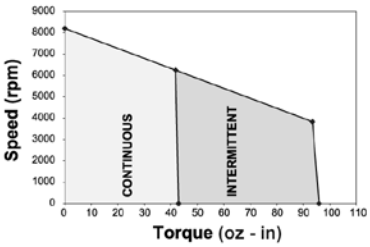

**BN23-23IP-01:** Continuous & Intermittent Operation at 24 VDC



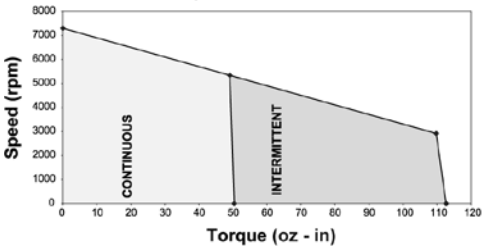

**BN23-23IP-02:** Continuous & Intermittent Operation at 36 VDC



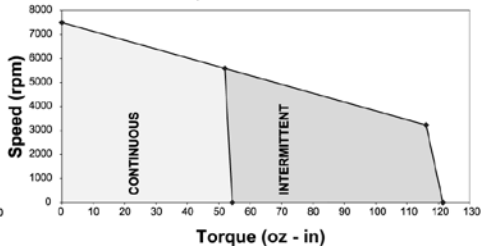

**BN23-23IP-03:** Continuous & Intermittent Operation at 48 VDC



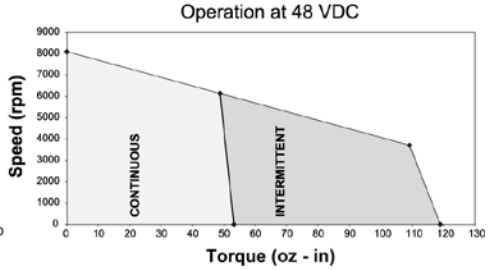

**BN23-28IP-01:** Continuous & Intermittent Operation at 24 VDC




**BN23-28IP-02:** Continuous & Intermittent Operation at 36 VDC




**BN23-28IP-03:** Continuous & Intermittent Operation at 48 VDC




**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.