

# BN42 IP65 Specifications

Inside Rotor  
Brushless Motors

## BN42 IP65 SPECIFICATIONS - Continuous Stall Torque 144 - 519 oz-in (1.02 - 3.67 Nm) Peak Torque 609 - 2560 oz-in (4.30 - 18.1 Nm)

Part Number*	BN42-23IP - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			BN42-33IP - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			BN42-43IP - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			BN42-53IP - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input 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	2.30			3.30			4.30			5.30		
	millimeters	58.4			83.8			109.2			134.6		
Terminal Voltage	volts DC	24.0	50.0	100.0	24.0	50.0	100.0	24.0	50.0	100.0	24.0	50.0	100.0
Peak Torque	oz-in	609.0	609.0	609.0	1248.0	1248.0	1248.0	1906.0	1906.0	1906.0	2560.0	2560.0	2560.0
	Nm	4.3005	4.3005	4.3005	8.8128	8.8128	8.8128	13.4592	13.4592	13.4592	18.0774	18.0774	18.0774
Continuous Stall Torque	oz-in	144.0	156.0	155.0	266.0	281.0	287.0	387.0	398.0	407.0	496.0	510.0	519.0
	Nm	1.0169	1.1016	1.0945	1.8784	1.9843	2.0267	2.7328	2.8105	2.8740	3.5025	3.6014	3.6649
Rated Speed	RPM	6050.0	5950.0	6140.0	3710.0	4710.0	4710.0	2380.0	3840.0	3840.0	1740.0	2820.0	2820.0
	rad/sec	634	623	643	389	493	493	249	402	402	182	295	295
Rated Torque	oz-in	102.0	113.0	110.0	213.0	198.0	200.0	340.0	290.0	296.0	451.0	413.0	419.0
	Nm	0.7203	0.7979	0.7768	1.5041	1.3982	1.4123	2.4009	2.0478	2.0902	3.1847	2.9164	2.9588
Rated Current	Amps	22.60	11.70	5.90	28.90	16.20	8.20	29.70	19.20	9.80	29.20	20.20	10.20
Rated Power	watts	456.0	497.0	499.0	584.0	690.0	697.0	598.0	824.0	841.0	580.0	861.0	874.0
Torque Sensitivity	oz-in/amp	5.20	11.00	21.40	8.41	14.00	28.00	12.90	17.20	34.30	17.40	23.10	46.30
	Nm/amp	0.0367	0.0777	0.1511	0.0594	0.0989	0.1977	0.0911	0.1215	0.2422	0.1229	0.1631	0.3269
Back EMF	volts/KRPM	3.80	8.20	15.80	6.22	10.40	20.70	9.52	12.70	25.40	12.80	17.10	34.20
	volts/rad/sec	0.0367	0.0777	0.1511	0.0594	0.0989	0.1977	0.0911	0.1215	0.2422	0.1229	0.1631	0.3269
Terminal Resistance	ohms	0.040	0.154	0.584	0.039	0.095	0.364	0.052	0.084	0.320	0.065	0.106	0.408
Terminal Inductance	mH	0.090	0.408	1.540	0.115	0.318	1.270	0.178	0.316	1.260	0.241	0.428	1.710
Motor Constant	oz-in/sq.rt.watt	26.00	28.03	28.00	42.59	45.42	46.41	56.57	59.35	60.63	68.25	70.95	72.49
	Nm/sq.rt.watt	0.18360	0.19794	0.19775	0.30072	0.32075	0.32772	0.39947	0.41907	0.42817	0.48194	0.50102	0.51186
Rotor Inertia	oz-in-sec <sup>2</sup> x10 <sup>-3</sup>	18.00	18.00	18.00	35.00	35.00	35.00	52.00	52.00	52.00	70.00	70.00	70.00
	g-cm <sup>2</sup>	1270.3	1270.3	1270.3	2470.0	2470.0	2470.0	3669.6	3669.6	3669.6	4939.9	4939.9	4939.9
Weight	oz	65.0	65.0	65.0	104.0	104.0	104.0	143.0	143.0	143.0	182.0	182.0	182.0
	g	1846.0	1846.0	1846.0	2953.6	2953.6	2953.6	4061.2	4061.2	4061.2	5168.8	5168.8	5168.8
# 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	3.8	3.2	3.2	2.7	2.4	2.3	2.3	2.1	2.0	2.1	2.0	1.9
Electrical Time Constant	ms	2.25	2.65	2.64	2.95	3.35	3.49	3.42	3.76	3.94	3.71	4.04	4.19
Thermal Resistivity	deg. C/watt	1.2	1.2	1.2	1.0	0.9	0.9	0.9	0.8	0.8	0.9	0.7	0.7
Speed/Torque Gradient	rpm/oz-in	2.0	1.7	1.7	0.7	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.3

**Notes:**

- Motor mounted to a 10 x 10 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.

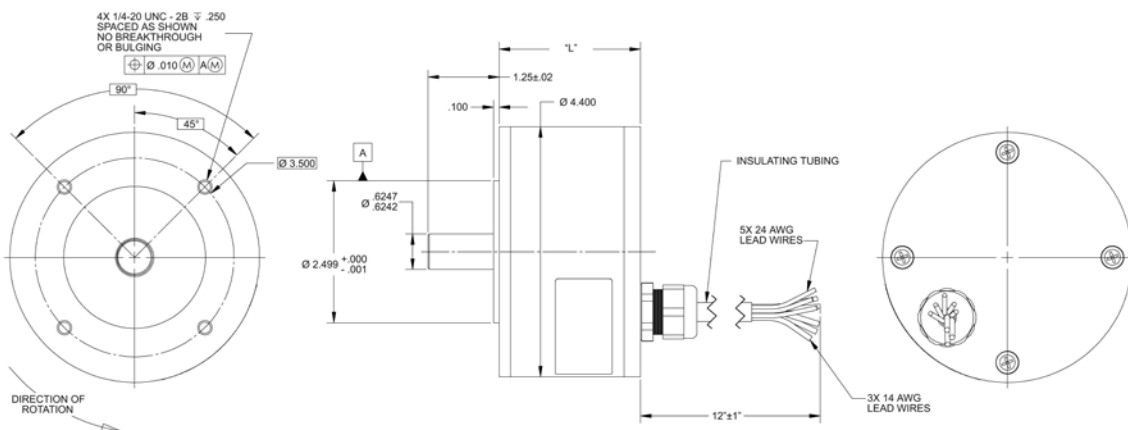
\*Many other custom mechanical options are available – consult factory.

\*\*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"/> <b>TERMINATION</b> | <input type="checkbox"/> <b>FEEDBACK OPTIONS</b> | <input type="checkbox"/> <b>OTHER OPTIONS</b> |
| L – Leads (std)  | H – Hall Effect (std)                            | D – Drive                                     |
| C – Connector  | R – Resolver                                     | E – Encoder                                   |
| M – MS connector                                       | S – Sensorless                                   | G – Gearhead                                  |

### BN42 IP65 Typical Outline



### Termination Table

PIN COLOR	CONNECTION
YELLOW	V <sub>CC</sub>
GRAY	GROUND
RED	A COIL
BLACK	B COIL
GREEN	C COIL
BLUE	S2 OUT
BROWN	S1 OUT
ORANGE	S3 OUT

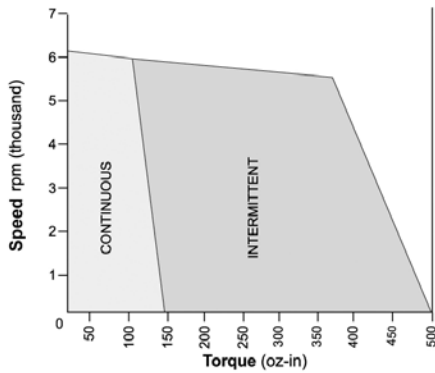
Dimensions are in inches

**Note:** An optional 4.15 (105.4) square front end cap is available.

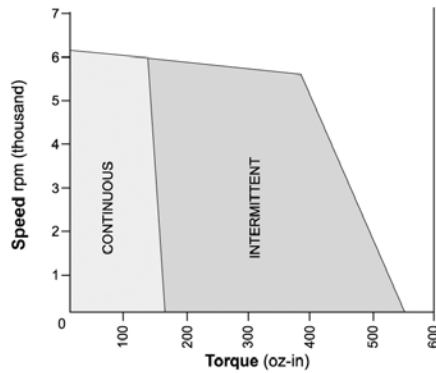
# BN42 IP65 Performance Curves

## BN42 IP65 Performance Curves

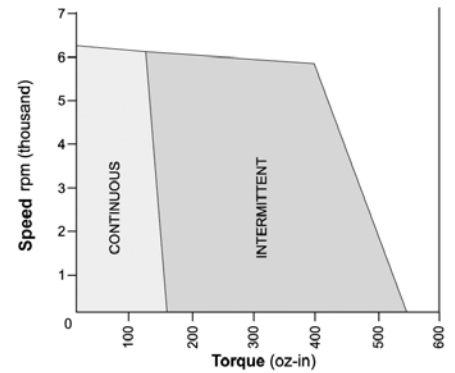
**BN42-23IP-01: Continuous & Intermittent Operation at 24 Volt DC**



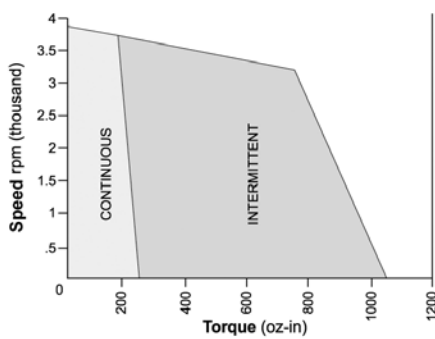
**BN42-23IP-02: Continuous & Intermittent Operation at 50 Volt DC**



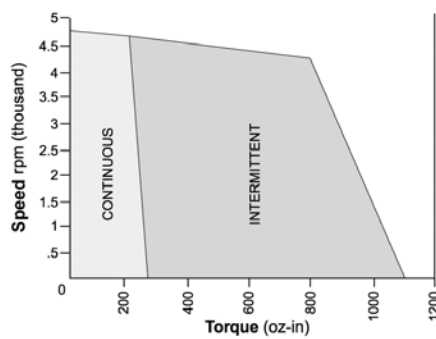
**BN42-23IP-03: Continuous & Intermittent Operation at 100 Volt DC**



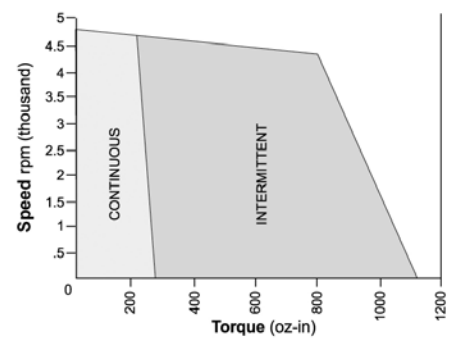
**BN42-33IP-01: Continuous & Intermittent Operation at 24 Volt DC**



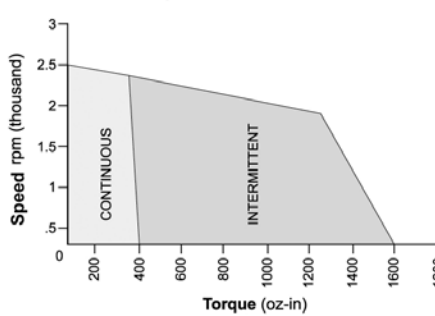
**BN42-33IP-02: Continuous & Intermittent Operation at 50 Volt DC**



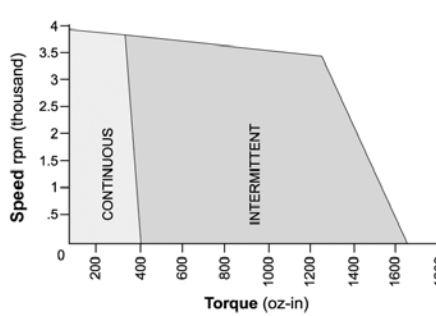
**BN42-33IP-03: Continuous & Intermittent Operation at 100 Volt DC**



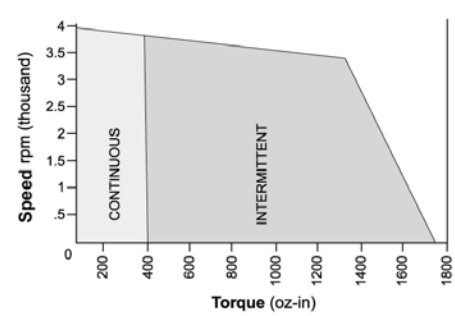
**BN42-43IP-01: Continuous & Intermittent Operation at 24 Volt DC**



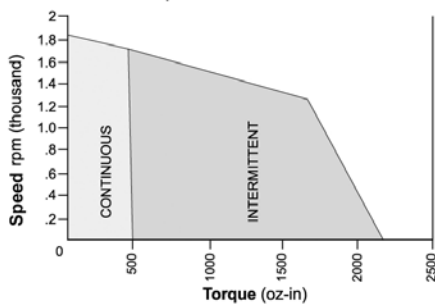
**BN42-43IP-02: Continuous & Intermittent Operation at 50 Volt DC**



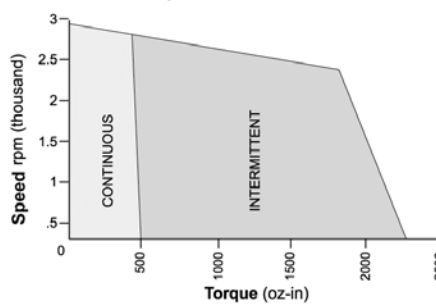
**BN42-43IP-03: Continuous & Intermittent Operation at 100 Volt DC**



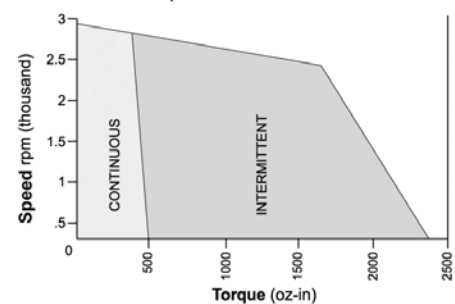
**BN42-53IP-01: Continuous & Intermittent Operation at 24 Volt DC**



**BN42-53IP-02: Continuous & Intermittent Operation at 50 Volt DC**



**BN42-53IP-03: Continuous & Intermittent Operation at 100 Volt DC**



**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.