Silencer® Series
Brushless DC Motor

BSG23 High Performance
Unique Stator Design

TYPICAL APPLICATIONS

- Commercial and military aerospace
- Computer-controlled embroidery machines
- Scanners
- Packaging equipment and printing products
- HVAC equipment (air moving)
- Robotics applications
- Semiconductor handling and insertion machines
- Actuators
- Battery-powered medical applications
    - Portable oxygen concentrators
    - Mobility and patient assistance

FEATURES

- Inside rotor construction for quick acceleration
- 8 pole motor
- Compact size – 1.9 and 2.9 inches long
- Diameter size – 2.25 inches
- Continuous torque up to 137 oz-in
- High energy sintered neodymium magnets
- Safe, arcless operation
- High torque per dollar ratio
- Unique stator construction - optimal copper slot fill for high motor constant (Km)

BENEFITS

- Operation at any single speed - not limited to AC frequency
- Motor life is not limited to brush or commutator life
- An essentially linear speed / torque curve
- Efficient operation without losses associated with brushes and commutation or armature induction
- Precise, variable speed control
- Extremely quiet operation
- Long-life operation
- High performance in a compact package

Quiet, Brushless Motors

Utilizing high energy sintered neodymium magnets and a unique stator design, the BSG23 brushless motor offers over two times the torque capability of our standard BN23 brushless motor. Ideal for applications where maximum performance and compact size are critical. Designed for maximum efficiency, this motor is a viable alternative to costly traditional brushless DC servo motors.

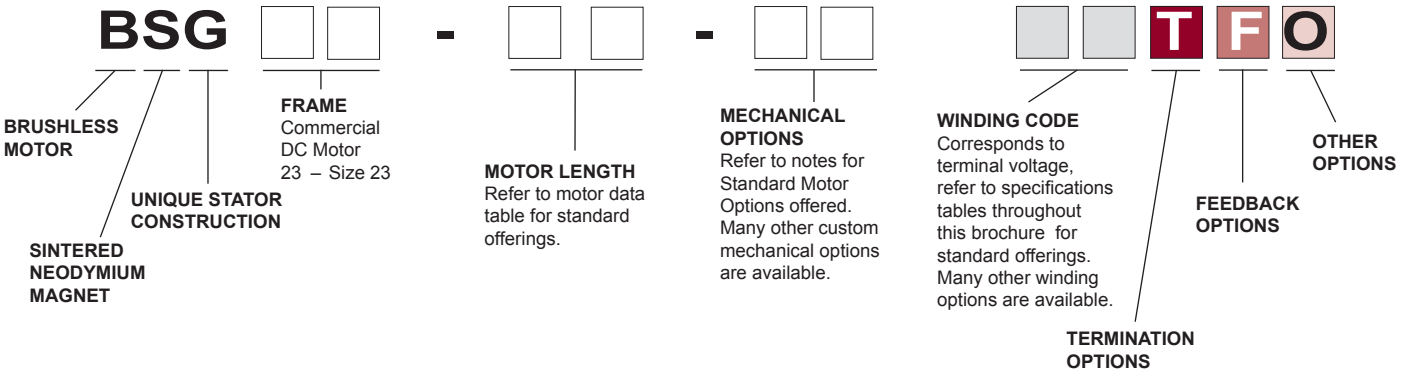
Typical options include electronic drives, encoders, gearheads, as well as Hall effect, resolvers, sensorless feedback and black finned aluminum housing (for additional heat transfer).

For more information about how this product can be tailored to fit your specific application, contact our applications engineers.

BSG23-18 Specifications

SPECIFICATION AND NUMBERING SYSTEM

Part Numbering System Guide



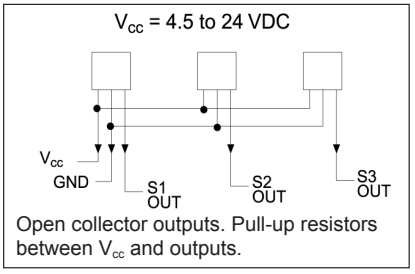
BSG23 SPECIFICATIONS - *Continuous Stall Torque 47 - 137 oz-in (XX - XX Nm)*
Peak Torque 300 - 907 oz-in (2.1 - 6.4 Nm)

		BSG23-18AB - □□ T F O			BSG23-28AA - □□ T F O		
		01	02	03	01	02	03
L - Length	inches	1.9			2.9		
	millimeters	48.26			73.66		
Terminal Voltage	volts DC	12	24	48	12	24	48
Peak Torque	oz-in	300	300	300	849	896	907
	Nm	2.1	2.1	2.1	5.995	6.32	6.4
Continuous Stall Torque	oz-in	47	56	59	133	137	137
	Nm	0.33	0.40	0.42	0.94	0.97	0.97
Rated Speed	RPM	4000	4000	4000	2255	2411	2319
	rad/sec	419	419	419	236	252	243
Rated Torque	oz-in	45	54	57	109	110	117
	Nm	0.32	0.38	0.40	0.77	0.78	0.83
Rated Current	Amps	14.0	8.4	4.7	19.8	11.0	5.53
Rated Power	watts	133.14	159.76	168.64	182	196	201
Torque Sensitivity	oz-in/amp	3.54	7.08	14.0	4.95	10.1	20.5
	Nm/amp	0.025	0.050	0.099	0.035	0.071	0.15
Back EMF	volts/KRPM	2.62	5.24	10.35	3.64	7.52	15.2
	volts/rad/sec	0.025	0.050	0.099	0.034	0.072	0.145
Terminal Resistance	ohms	0.10	0.28	1.00	0.072	0.232	0.930
Terminal Inductance	mH	0.12	0.46	1.84	0.111	0.448	1.872
Motor Constant	oz-in/sq.rt.watt	11.19	13.38	14.00	18.45	20.97	21.26
	Nm/sq.rt.watt	0.079	0.094	0.099	0.143	0.148	0.149
Rotor Inertia	oz-in-sec^{2}x10^{-3}	0.99	0.99	0.99	2.32	2.32	2.32
	g-cm^2	69.9	69.9	69.9	1638	1638	1638
Weight	oz	17	17	17	34	34	34
	g	483	483	483	1417	1417	1417
# of Poles		8	8	8	8	8	8
Timing		120°	120°	120°	120°	120°	120°
Mech. Time Constant	ms	1.12	0.78	0.72	0.79	0.74	0.73
Electrical Time Constant	ms	1.15	1.64	1.84	2.45	2.59	2.62
Thermal Resistivity	deg. C/watt	3.00	3.00	3.00	2.34	1.91	2.00
Speed/Torque Gradient	rpm/oz-in	13.0	10.8	11.2	8.7	7.2	7.5
No Load	rpm	4600	4600	4600	3200	3200	3200

Timing Diagram for Hall Switches

DEGREES														
	ELEC	0	60	120	180	240	300	360	60	120	180	240	300	360
	MECH	0	15	30	45	60	75	90	105	120	135	150	165	180
S1 OUT														
S2 OUT														
S3 OUT														
A COIL		–	0	+	+	0	–	–	0	+	+	0	–	
B COIL		+	+	0	–	–	0	+	+	0	–	–	0	
C COIL		0	–	–	0	+	+	0	–	–	0	+	+	

Hall Effect Switches



Open collector outputs. Pull-up resistors between V_{cc} and outputs.

Notes:
1. Motor mounted to a 4 x 4 x 1/4 inches 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.

*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 above.

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

F FEEDBACK OPTIONS
H – Hall Effect (std)
R – Resolver
S – Sensorless

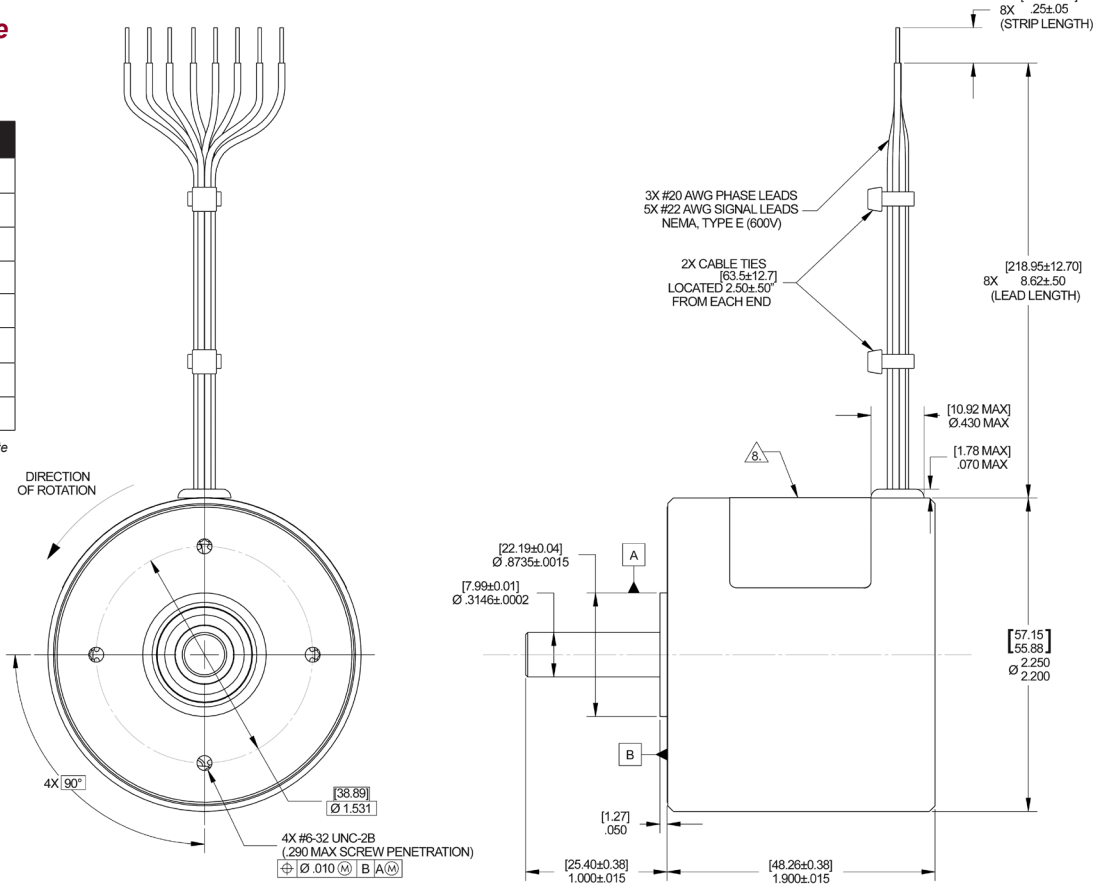
O OTHER OPTIONS
D – Drive
G – Gearhead
E – Encoder

BSG23-18 Typical Outline

Termination Table*

CONNECTION	LEAD COLOR
V_{CC}	YELLOW
GROUND	GRAY
A COIL	VIOLET
B COIL	BLACK
C COIL	GREEN
S2 OUT	BLUE
S1 OUT	BROWN
S3 OUT	WHITE

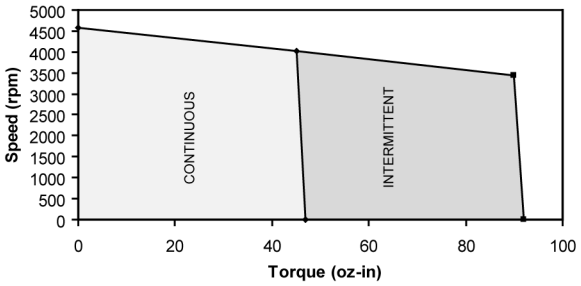
*We reservethe right to use solid color wires or white wires with color trace.



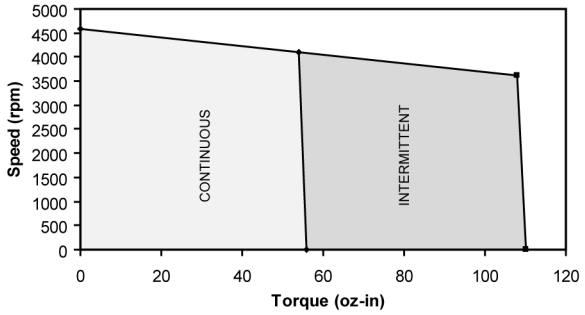
Dimensions are in inches [mm]

BSG23-18 Performance Curves

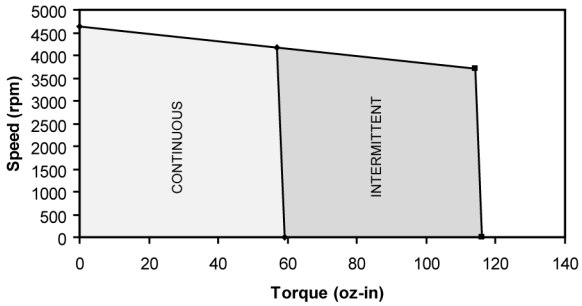
BSG23-18[ ][ ]-01LH: Continuous & Intermittent Operation at 12 Volt DC



BSG23-18[ ][ ]-02LH: Continuous & Intermittent Operation at 24 Volt DC



BSG23-18[ ][ ]-03LH: Continuous & Intermittent Operation at 48 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.

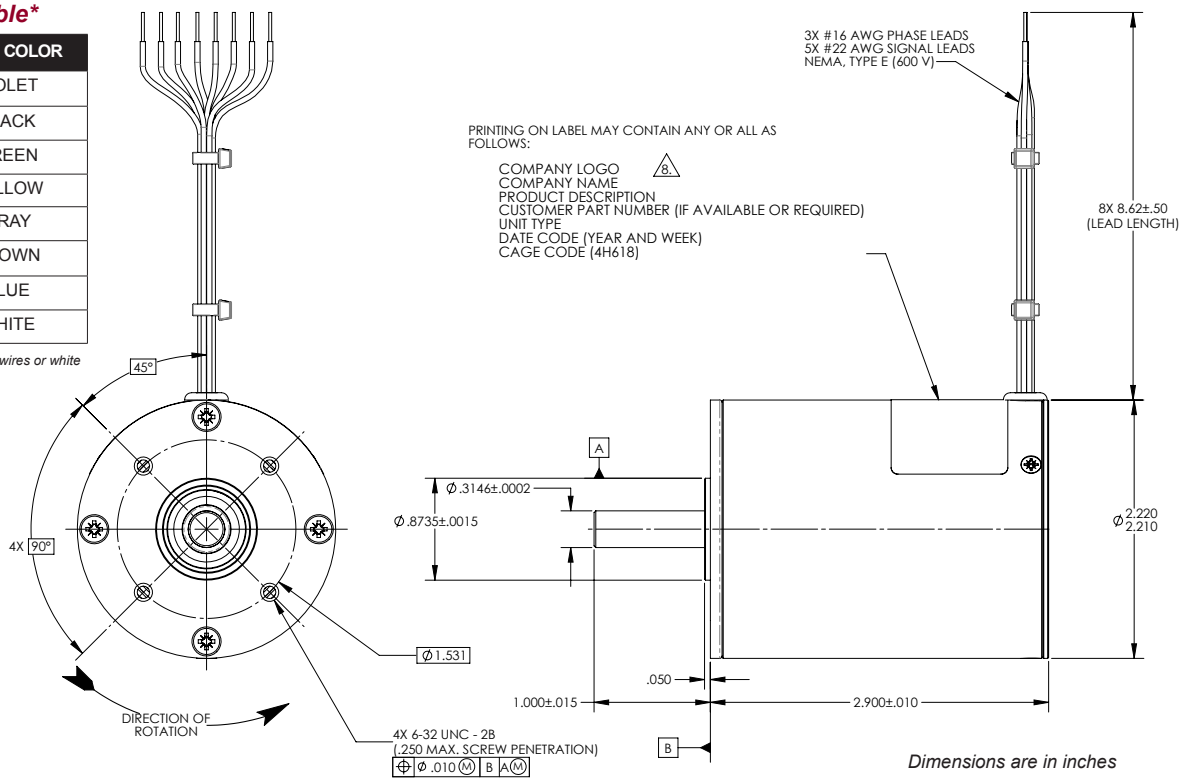
BSG23-28 Specifications

BSG23-28 Typical Outline

Termination Table*

CONNECTION	LEAD COLOR
A COIL	VIOLET
B COIL	BLACK
C COIL	GREEN
V_{CC}	YELLOW
GROUND	GRAY
S1 OUT	BROWN
S2 OUT	BLUE
S3 OUT	WHITE

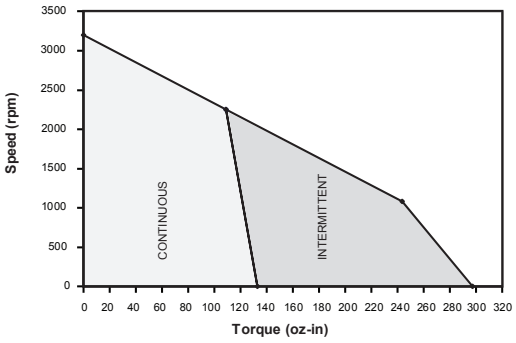
*We reservethe right to use solid color wires or white wires with color trace.



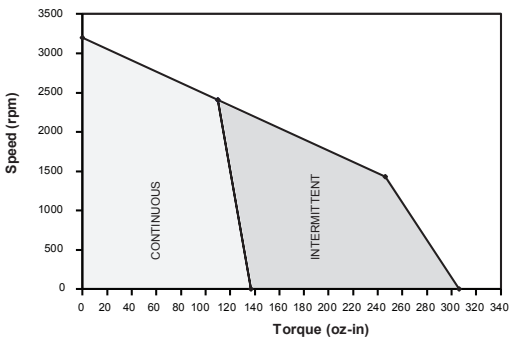
Dimensions are in inches

BSG23-28 Performance Curves

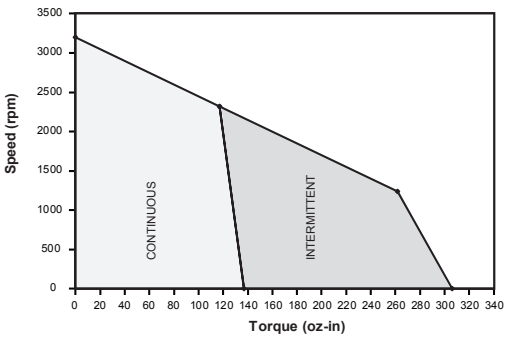
BSG23-28AA-01LH: Continuous and Intermittent Operation at 12 VDC



BSG23-28AA-02LH: Continuous and Intermittent Operation at 24 VDC



BSG23-28AA-03LH: Continuous and 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.