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A Full Line Up of Powerful Servos to Meet the Demands of Your Application!

Compumotor began manufacturing brushless servo motors with the release of the SM series in the spring of 1995. Since that time, we have continued to expand our product offering and have manufacturing plants in California and Italy.

Innovation in Design

Compumotor utilizes two distinct technologies in the manufacturing of brushless servo motors. The Slotless Design and the Bridged Stator Design both reduce motor manufacturing costs while providing performance advantages to the user.

The slotless design eliminates all detent torque in the motor, providing superior performance in applications requiring smooth, low speed operation. This design also results in higher rotor inertia, providing an advantage in applications involving high inertia loads.

The bridged stator design results in extremely high torque-to-inertia ratios, providing a performance advantage in applications requiring high accelerations. The bridged stator design also greatly reduces detent torque and mechanical noise when compared to a conventional slotted motor.

Compumotor can also provide an integrated planetary gearhead for use with our brushless servo motors. Our unique design integrates the pinion of the gearhead into the motor shaft, reducing total package length by almost two inches.

Standards or Specials in 10 Days

Compumotor's brushless servo motors are manufactured in our modern JIT manufacturing facility. Highly evolved manufacturing philosophies provide levels of service and product availability previously unattainable in the servo motor industry.

Compumotor's lead times average less than ten days for all standard and custom servo motors.

SM Series



- Size 16 and 23
- 0.8 to 11.3 in-lb. continuous torque
- Slotless design
- Rugged housing (IP65 option)
- Connection options

SE Series



- Size 16 and 23
- 0.8 to 10.1 in-lb. continuous torque
- Slotless design
- Plastic encoder cover
- Short package length

BE Series



- Size 16, 23 and 34
- 1.4 to 46 in-lb. continuous torque
- Bridged stator design
- 2000-line encoder standard
- Connection options

M Series



- Size 105, 145 and 205mm
- Up to 90 Nm of power
- Brushless construction
- Encoder feedback and resolver

Planetary Gearheads



- Size 16, 23, 34 and 92
- Integrated pinion design
- Shortest package length available

NeoMetric & J Series



- 70 mm and 92 mm
- 6 to 61 in-lb. continuous torque
- Bridged stator design
- Rugged housing (IP65 option)
- Connection options

SL Series



- Size 42, 63, 102 and 140mm
- 20 to 350 lbs continuous force
- Slotless design
- High speeds
- High precision

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Custom Designed Servo Motors for Your Specific Application!

Compumotor offers a broad range of standard options with all of our brushless servo motor families. Our numerous shaft, feedback and connection options will fulfill the needs of most of our customers. However, we realize that from time to time the need arises to have a custom motor designed specially for your application.

Whether you need custom connectors, mounting, or a custom winding, Compumotor can build a motor designed to your exact specifications. Compumotor provides these special designs for our customers with:

- Minimal impact on product lead time
- Modest impact on pricing
- No minimum quantities

Compumotor's modern manufacturing system allows us to offer custom motor solutions without sacrificing product quality and availability. All of our custom motors are built in our standard servo motor work cell, and our computerized custom product tracking system allows us to provide consistent, high-quality custom products. And, because custom motor manufacturing is integrated into our standard manufacturing process, we can often build and ship custom designed motors and cables in the same time frame as standard products.

Compumotor provides this service for one simple reason: to make it easier for you, our customer, to integrate a Compumotor servo motor into your application. We provide more than just a component, we provide a custom designed servo motor solution.

Common Special Requests

Connectorization

- Right angle connector housing
- MS connectors on back cover
- Special cable lengths
- Hi-flex cables
- Customer specified cables and connectors
- Cable exiting through back cover

Flanges

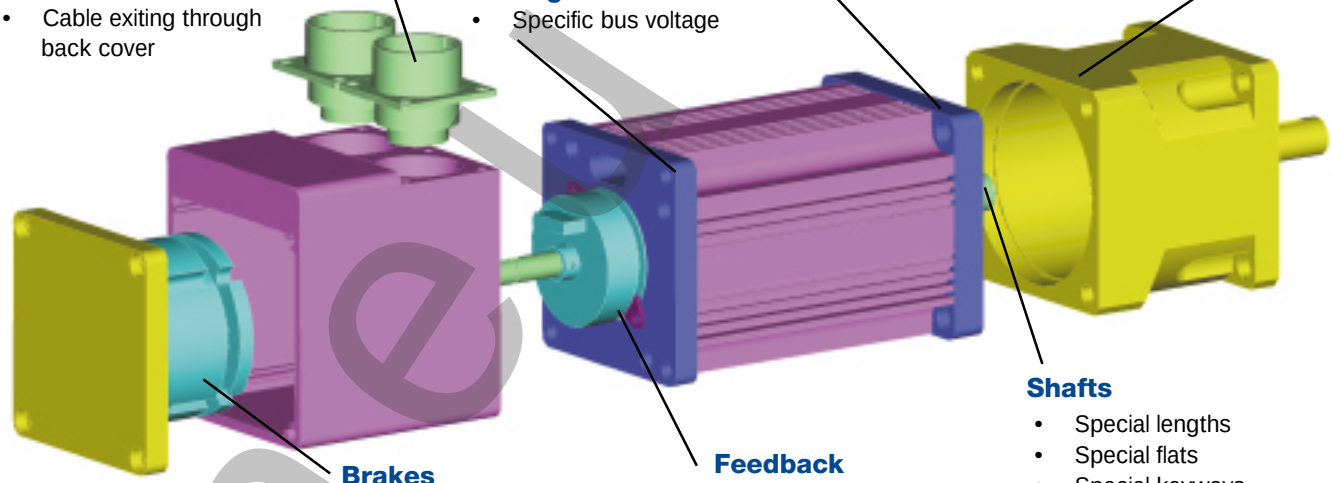
- Tapped mounting holes
- Customer specified flanges
- Face mount

Gearheads

- Non-standard ratios
- Customer specified flanges
- Customer specified output shaft

Windings:

- Specific bus voltage



Brakes

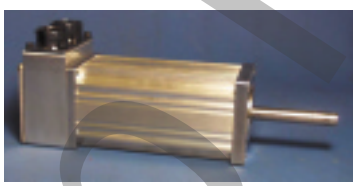
- Internal or external

Feedback

- Higher resolution encoders
- Higher temperature encoders

Shafts

- Special lengths
- Special flats
- Special keyways
- Special shaft diameters
- Metric shaft diameters
- Hollow shafts
- Rear Shaft Extension
- Double flats
- Shaft pinning
- Pressed on gears
- Center tapped
- Special shaft materials







Miscellaneous Options

- Private label back cover
- Special windings
- Shorter lengths
- High speed balancing
- Special finish

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SM & SE Series Motors



SM Series High-Performance Slotless Design

The SM Series brushless servo motors feature a slotless stator design. This design eliminates all detent torque in the motor, allowing the SM Series motors to provide extremely smooth motion, especially at low speeds. The slotless design also creates a higher rotor inertia, which is ideal for applications involving high inertial loads (such as lead screws and belt drives).

The SM Series motors also feature a rugged anodized aluminum body and connector housing. An IP65 rating can be obtained on motors with MS connectors and an optional shaft seal. All SM motors are CE (LVD) compliant.

The SM Series servo motors are available with integrated planetary gearheads in ratios up to 100:1. Our unique package integrates the gearhead pinion into the motor shaft, reducing the overall package length by up to 2 inches.

SM Series Features

- Size 16 and 23
- 0.8 to 11.3 lb-in continuous torque
- Brushless construction
- Slotless design
  - Negligible detent torque
  - Reduced torque ripple
  - Medium inertia
- High-performance neodymium magnets
- Thermostat protected
- TENV housing
- IP65 option
- Feedback options
  - Encoder/Hall effect
  - Hall-effect only
  - Resolver
- Connectorization choices
- Special winding availability
- Ten day deliveries
- Two-year warranty
- CAD (.dxf) drawings available
- CE Compliant

Part Numbering System

SM	232	A	E-	N	MS	N
SM Series	*Frame, Magnet Length* 160 230 161 231 162 232 233	*Winding* A B	*Feedback* D - 500 ppr encoder[1] E - 1000 ppr encoder[1] H - Hall-effect only R - resolver[2]	*Shafting* N - normal F - flat K - keyway[2] L - long[2]	*Connection* FL - 18" leads 10 - 10' cable[3] 25 - 25' cable[3,5] MS - military style TQ - trap drive GS - Gemini amp[6] series	*Options* N - none V - shaft seal[4] GXX - Gearhead[7]

1 *Includes Hall-effect*
2 *Not available on size 16 or SM230*
3 *Cable is hard-wired*
4 *With MS, TQ or GS connectors—IP65, not available on size 16*
5 *Size 23 only*
6 *See amplifier sections for specific motor/amplifier compatibility*
7 *Specify "K" shaft option with Gearheads*

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SE Series Low-Cost, Space-Saving Package



The SE Series brushless servo motors were created with the OEM in mind. The SE Series motors provide the same performance as the SM Series, but in a lower cost, space-saving package. Designed for embedded applications, these motors are available in flying lead configurations and have a plastic encoder cover. Customer specified connectors or shaft modifications are easily incorporated with minimal impact on price and delivery.

The performance curves and electrical specifications for the SE series motors remain unchanged from the SM Series. All SE Series motors are CE (LVD) compliant.

The SE Series servo motors are available with integrated planetary gearheads in ratios up to 100:1. Our unique package integrates the gearhead pinion into the motor shaft, reducing the overall package length by up to 2 inches.

SE Features

- Size 16 and 23
- 0.8 to 10.1 lb-in continuous torque
- Brushless Construction
- Slotless Design
  - Negligible detent torque
  - Reduced torque ripple
  - Medium Inertia
- High performance neodymium magnets
- Thermostat protected
- 1000 ppr encoder
- Special winding availability
- Ten day deliveries
- Two year warranty
- CAD (.dxf) drawings available
- CE Compliant

SE Part Numbering System

SE	161	A	E-	N	FL	N
SE Series	*Frame, Magnet Length*	*Winding*	*Feedback*	*Shafting*	*Connection*	*Options*
	160[1] 230[1] 161 231 162 232 233	A B	E - 1000 ppr encoder[2]	N - Normal F - Flat K - Keyway[3] L - Long[3]	FL - 18” Leads	N - None GXX - Gearhead

1 *SE160 and 230 do not include temperature switch*
2 *Includes Hall-effect*
3 *Not available on size 16 or SE230*

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Size 16, Encoder Feedback, Specifications*

Parameter	Symbol	Units	SM160A	SM160B	SM161A	SM161B	SM162A	SM162B
Stall Torque Continuous[1]	T_{cs}	lb-in	0.8	0.8	1.6	1.6	2.9	3.1
		oz-in	13	13	26	26	47	49
		Nm	0.09	0.09	0.18	0.18	0.33	0.34
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	2.8	5.6	2.7	5.2	2.6	5.1
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.5	4.8	2.3	4.5	2.3	4.4
Peak Torque[6]	T_{pk}	lb-in	2.5	2.5	4.9	4.9	8.8	9.1
		oz-in	40	40	78	78	141	145
		Nm	0.28	0.28	0.55	0.54	0.99	1.02
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	8.5	16.7	8.1	15.5	7.8	15.2
Peak Current[6,7]	I_{pk}(trap)	Amps DC	7.4	14.4	7.0	13.4	6.8	13.2
Rated Speed[2]	ω_r	rpm	7,500	7,500	7,500	7,500	7,500	7,500
Current @ Rated Speed	I_r(sine)	Amps	2.5	4.9	2.2	4.2	2.2	4.3
Current @ Rated Speed	I_r(trap)	Amps	2.2	4.2	1.9	3.6	1.9	3.8
Torque @ Rated Speed	T_r	lb-in	0.6	0.6	1.1	1.1	2.3	2.3
		oz-in	10	10	18	18	37	37
		Nm	0.07	0.07	0.13	0.13	0.26	0.26
Shaft Power @ Rated Speed	P_o	watts	57	55	97	100	205	204
Voltage Constant[3,4]	K_b	volts/radian/sec	0.038	0.020	0.079	0.041	0.147	0.078
Voltage Constant[3,4]	K_e	volts/KRPM	4.02	2.08	8.27	4.29	15.39	8.17
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	4.71	2.43	9.69	5.03	18.03	9.57
		Nm/Amp Peak	0.033	0.017	0.068	0.035	0.126	0.067
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	5.43	2.81	11.19	5.81	20.82	11.04
		Nm/Amp DC	0.038	0.02	0.078	0.041	0.146	0.077
Resistance[3]	R	Ohms	3.43	0.90	4.53	1.24	6.50	1.73
Inductance[5]	L	mH	0.53	0.13	0.81	0.21	1.39	0.33
Maximum Bus Voltage	V_m	Volts DC	100	100	170	170	170	170
Thermal Resistance Wind-Amb	R_{th} w-a	°C/watt	3.20	3.20	2.70	2.70	2.00	2.00
Motor Constant	K_m	oz-in/√watt	2.93	2.96	5.26	5.21	8.16	8.40
		Nm/√watt	0.021	0.021	0.037	0.036	0.057	0.059
Viscous Damping	B	oz-in/Krpm	0.162	0.162	0.284	0.284	0.300	0.300
		Nm/Krpm	1.13 E-3	1.13 E-3	1.99 E-3	1.99 E-3	2.10 E-3	2.10 E-3
Static Friction	T_f	oz-in	0.10	0.10	0.15	0.15	0.20	0.20
		Nm	7.0 E-4	7.0 E-4	1.05 E-3	1.05 E-3	1.40 E-3	1.40 E-3
Motor Thermal Time Constant	τ_{th}	minutes	10	10	11.6	11.6	14.2	14.2
Electrical Time Constant	τ_{elec}	millisecs	0.16	0.15	0.18	0.17	0.21	0.19
Mechanical Time Constant	τ_{mch}	millisecs	11.7	11.5	7.7	7.8	5.5	5.2
Intermittent Torque Duration[10]	T_{2x}	seconds	8	8	9	9	14	14
Peak Torque Duration[11]	T_{3x}	seconds	3	3	4	4	5	5
Rotor Inertia	J	lb-in-sec²	4.4 E-5	4.4 E-5	9.4 E-5	9.4 E-5	1.6 E-4	1.6 E-4
		kg-m²	5.0 E-6	5.0 E-6	1.1 E-5	1.1 E-5	1.8 E-5	1.8 E-5
Number of Poles	Np		4	4	4	4	4	4
Weight	#	lbs	0.7	0.7	1.1	1.1	1.6	1.6
		kg	0.3	0.3	0.5	0.5	0.7	0.7
Winding Class			H	H	H	H	H	H

* SM & SE Series specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate, @40°C ambient derate phase currents and torques by 12%.*
2 *Maximum speed is 7500RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, ±10% line-to-line*
4 *Value is mesured peak of sine wave.*
5 *±30%, Line-to-Line, inductance bridge measurement @ 1 kHz*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum Time duration with 2 times rated applied with initial winding temp at 60°C.*
11 *Maximum Time duration with 3 times rated applied with initial winding temp at 60°C.*

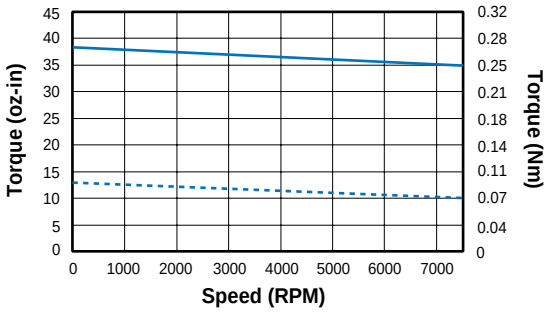
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier

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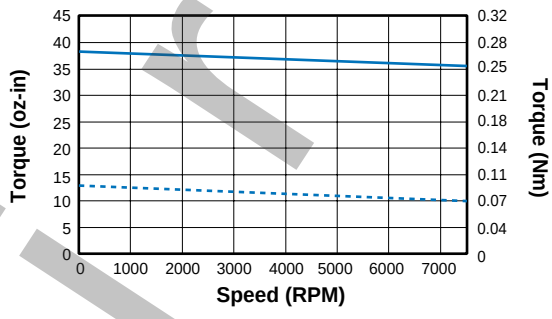
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Size 16, Encoder Feedback, Performance Curves
(SM & SE Series data are identical unless otherwise noted)

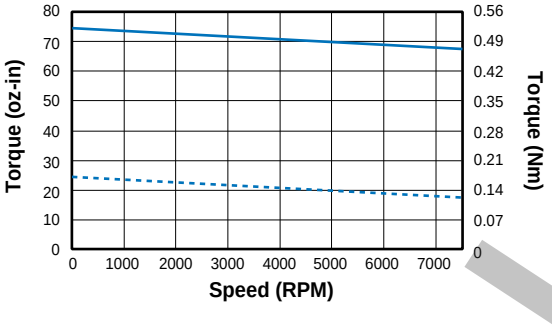
SM160AE
Vbus=75VDC, Ics (sine)=2.8 amps, Ipk(sine)=8.5 amps



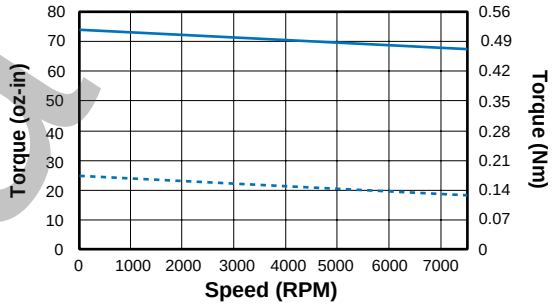
SM160BE
Vbus=75VDC, Ics (sine)=5.6 amps, Ipk(sine)=16.7 amps



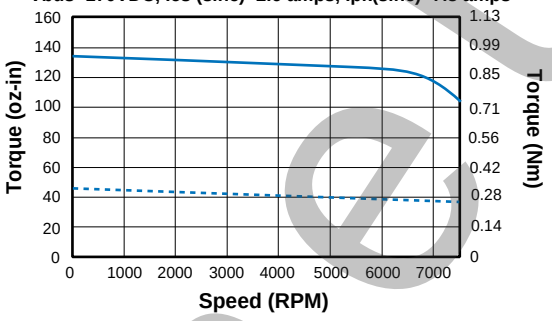
SM161AE
Vbus=170VDC, Ics (sine)=2.7 amps, Ipk(sine)=8.1 amps



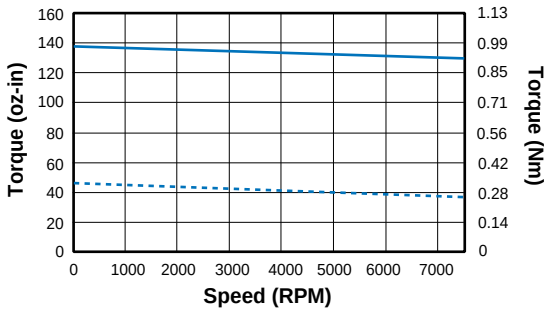
SM161BE
Vbus=170VDC, Ics (sine)=5.2 amps, Ipk(sine)=15.5 amps



SM162AE
Vbus=170VDC, Ics (sine)=2.6 amps, Ipk(sine)=7.8 amps



SM162BE
Vbus=170VDC, Ics (sine)=5.1 amps, Ipk(sine)=15.2 amps



CONTINUOUS PEAK (170 VAC)

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Size 23, Encoder Feedback, Specifications*

Parameter	Symbol	Units	SM230A	SM230B	SM231A	SM231B	SM232A	SM232B	SM233A	SM233B
Stall Torque Continous[1]	T_{cs}	lb-in	1.7	1.6	3.8	3.4	6.6	7.0	10.1	9.7
		oz-in	27	26	61	54	106	111	161	156
		Nm	0.19	0.18	0.43	0.38	0.74	0.78	1.13	1.09
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	2.7	5.5	2.9	5.5	2.8	5.4	2.7	5.3
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.4	4.7	2.5	4.8	2.4	4.7	2.4	4.5
Peak Torque[6]	T_{pk}	lb-in	5.1	4.9	11.3	10.0	19.8	20.9	30.2	29.2
		oz-in	82	78	181	160	316	334	483	467
		Nm	0.57	0.55	1.27	1.12	2.21	2.34	3.38	3.27
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	8.2	16.4	8.8	16.6	8.3	16.1	8.1	15.8
Peak Current[6,7]	I_{pk}(trap)	Amps DC	7.1	14.2	7.6	14.3	7.2	14.0	7.1	13.6
Rated Speed[2]	ω_r	rpm	7500	7500	7500	7500	7500	7500	5800	5800
Current@Rated Speed	I_r(sine)	Amps	2.4	4.9	2.5	4.8	2.3	4.5	2.4	4.6
Current@Rated Speed	I_r(trap)	Amps	2.1	4.2	2.2	4.2	2.0	3.9	2.0	4.0
Torque@Rated Speed	T_r	lb-in	1.4	1.3	2.9	2.8	5.1	5.4	8.1	7.6
		oz-in	22	21	47	44	81	86	129	121
		Nm	0.15	0.15	0.33	0.31	0.57	0.60	0.90	0.85
Shaft Power@Rated Speed	P_o	watts	122	116	261	244	449	477	553	519
Voltage Constant[3,4]	K_b	Volts/rad/s	0.081	0.039	0.169	0.079	0.310	0.169	0.484	0.242
Voltage Constant[3,4]	K_e	Volts/KRPM	8.48	4.09	17.70	8.27	32.46	17.70	50.68	25.34
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	9.93	4.79	20.72	9.69	38.02	20.72	59.35	29.68
		Nm/Amp Peak	0.070	0.034	0.145	0.068	0.266	0.145	0.415	0.208
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	11.47	5.54	23.93	11.19	43.90	23.93	68.53	34.27
		Nm/Amp DC	0.080	0.039	0.168	0.078	0.307	0.168	0.480	0.240
Resistance[3]	R	Ohms	4.43	1.12	5.22	1.46	7.50	2.00	9.65	2.58
Inductance[5]	L	mH	1.19	0.28	1.64	0.44	2.90	0.78	4.08	1.06
Maximum Bus Voltage	V_m	Volts DC	100	100	170	170	340	170	340	170
Therm. Resistance Wind-Amb	R_{th} w-a	°C/watt	2.67	2.67	2.00	2.00	1.54	1.54	1.25	1.25
Motor Constant	K_m	oz-in/√watt	5.45	5.23	10.47	9.26	16.03	16.92	22.06	21.33
		Nm/√watt	0.038	0.037	0.073	0.065	0.112	0.118	0.154	0.149
Viscous Damping	B	oz-in/Krpm	0.160	0.160	0.250	0.250	0.360	0.360	0.540	0.540
		Nm/Krpm	1.12 E-3	1.12 E-3	1.75 E-3	1.75 E-3	2.52 E-3	2.52 E-3	3.78 E-3	3.78 E-3
Static Friction	T_f	oz-in	0.20	0.20	0.30	0.30	0.70	0.70	1.00	1.00
		Nm	1.40 E-3	1.40 E-3	2.10 E-3	2.10 E-3	4.90 E-3	4.90 E-3	7.00 E-3	7.00 E-3
Motor Thermal Time Constant	τ_{th}	minutes	18.3	18.3	20	20	21.6	21.6	23.3	23.3
Electrical Time Constant	τ_{elec}	millisecs	0.27	0.25	0.31	0.30	0.39	0.39	0.42	0.41
Mechanical Time Constant	τ_{mch}	millisecs	18.3	19.9	9.5	12.2	7.2	6.5	5.4	5.8
Intermittent Torque Duration[10]	T_{2x}	seconds	11	11	11	11	18	18	20	20
Peak Torque Duration[11]	T_{3x}	seconds	5	5	4	4	6	6	7	7
Rotor Inertia	J	lb-in-sec²	2.4 E-4	2.4 E-4	4.6 E-4	4.6 E-4	8.2 E-4	8.2 E-4	1.2 E-3	1.2 E-3
		kg-m²	2.7 E-5	2.7 E-5	5.2 E-5	5.2 E-5	9.3 E-5	9.3 E-5	1.3 E-4	1.3 E-4
Number of Poles	Np		4	4	4	4	4	4	4	4
Weight	#	lbs	1.2	1.2	2.1	2.1	3.0	3.0	3.9	3.9
		kg	0.5	0.5	1.0	1.0	1.4	1.4	1.8	1.8
Winding Class			H	H	H	H	H	H	H	H

* SM & SE Series specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate, @40°C ambient derate phase currents and torques by 12%.*

2 *Maximum speed is 7500RPM. For higher speed operation please call the factory.*

3 *Measured Line to Line, ±10% line-to-line*

4 *Value is mesured peak of sine wave.*

5 *±30%, Line-to-Line, inductance bridge measurement @ 1 kHz*

6 *Initial winding temperature must be 60°C or less before peak current is applied.*

7 *DC current through a pair of motor phases of a trapezoidally (six state) commutated motor.*

8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*

9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*

10 *Maximum Time duration with 2 times rated applied with initial winding temp at 60°C.*

11 *Maximum Time duration with 3 times rated applied with initial winding temp at 60°C..*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

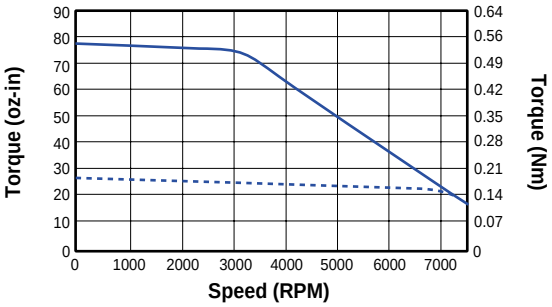
Preliminary

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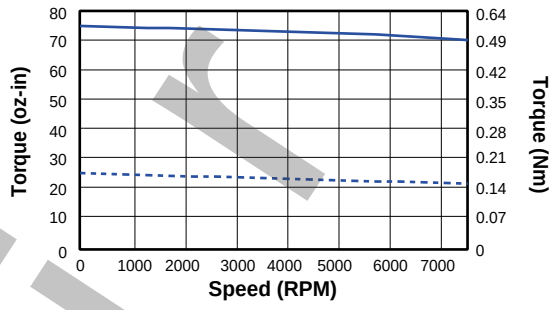
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Size 23, Encoder Feedback, Performance Curves
(SM & SE Series data are identical unless otherwise noted)

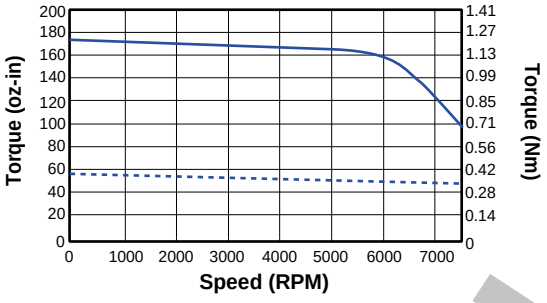
SM230AE
Vbus=75VDC, Ics (sine)=2.7 amps, Ipk(sine)=8.2 amps



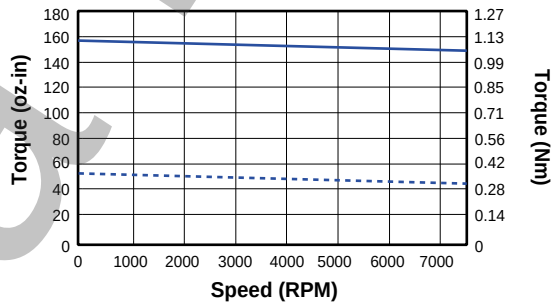
SM230BE
Vbus=75VDC, Ics (sine)=5.5 amps, Ipk(sine)=16.4 amps



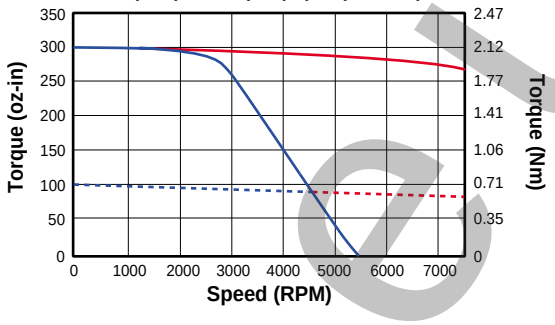
SM231AE
Ics (sine)=2.9 amps, Ipk(sine)=8.8 amps



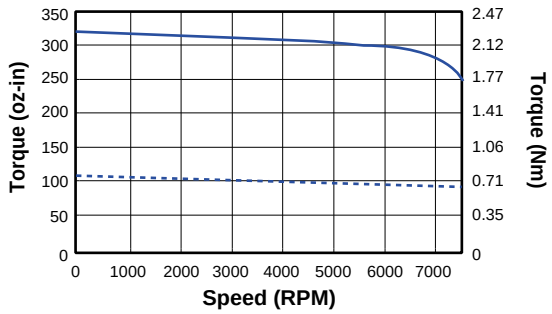
SM231BE
Ics (sine)=5.5 amps, Ipk(sine)=16.6 amps



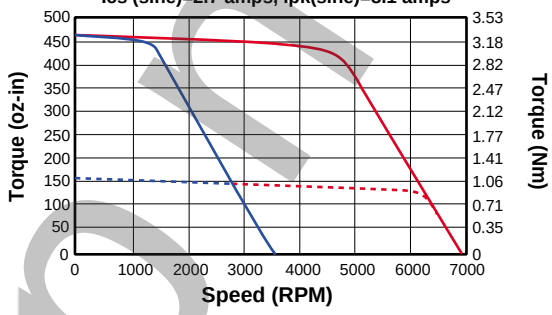
SM232AE
Ics (sine)=2.8 amps, Ipk(sine)=8.3 amps



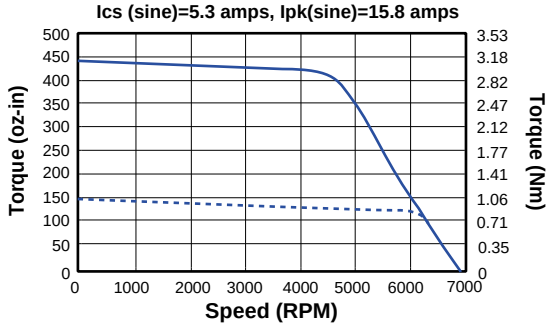
SM232BE
Ics (sine)=5.4 amps, Ipk(sine)=16.1 amps



SM233AE
Ics (sine)=2.7 amps, Ipk(sine)=8.1 amps



SM233BE
Ics (sine)=5.3 amps, Ipk(sine)=15.8 amps





170 VDC 340 VDC

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Size 23, Resolver Feedback, Specifications*

Parameter	Symbol	Units	SM231A	SM231B	SM232A	SM232B	SM233A	SM233B
Stall Torque Continous[1]	T_{cs}	lb-in	4.3	3.8	7.4	7.8	11.3	10.9
		oz-in	68	60	118	125	180	174
		Nm	0.48	0.42	0.83	0.88	1.26	1.22
Stall Current Continuous[1,4,7]	I_{cs}(sine)	Amps Peak	3.3	6.2	3.1	6.0	3.0	5.9
Peak Torque[6]	T_{pk}	lb-in	12.7	11.2	22.1	23.3	33.8	32.7
		oz-in	203	179	354	373	540	523
		Nm	1.42	1.25	2.48	2.61	3.78	3.66
Peak Current[4,6,7]	I_{pk}(sine)	Amps Peak	9.8	18.5	9.3	18.0	9.1	17.6
Rated Speed[2]	ω_r	rpm	7500	7500	7500	7500	6000	6000
Current@Rated Speed	I_r(sine)	Amps	2.9	5.5	2.7	5.3	2.7	5.3
Current@Rated Speed	I_r(trap)	Amps	2.5	4.8	2.4	4.6	2.4	4.6
Torque@Rated Speed	T_r	lb-in	3.4	3.1	6.0	6.1	9.0	8.8
		oz-in	54	50	96	98	144	140
		Nm	0.38	0.35	0.67	0.69	1.01	0.98
Shaft Power@Rated Speed	P_o	watts	300	277	533	544	639	621
Voltage Constant[3,4]	K_b	Volts/rad/s	0.169	0.079	0.310	0.169	0.484	0.242
Voltage Constant[3,4]	K_e	Volts/KRPM	17.70	8.27	32.46	17.70	50.68	25.34
Torque Constant[8]	K_t(sine)	oz-in/Amp Peak	20.72	9.69	38.02	20.72	59.35	29.68
		Nm/Amp Peak	0.145	0.068	0.266	0.145	0.415	0.208
Resistance[3]	R	Ohms	5.22	1.46	7.50	2.00	9.65	2.58
Inductance[5]	L	mH	1.64	0.44	2.90	0.78	4.08	1.06
Maximum Bus Voltage	V_m	Volts DC	170	170	340	170	340	170
Therm. Resistance Wind-Amb	R_{th} w-a	°C/watt	2.00	2.00	1.54	1.54	1.25	1.25
Motor Constant	K_m	oz-in/√watt	10.47	9.26	16.03	16.92	22.06	21.33
		Nm/√watt	0.073	0.065	0.112	0.118	0.154	0.149
Viscous Damping	B	oz-in/Krpm	0.25	0.25	0.36	0.36	0.54	0.54
		Nm/Krpm	1.75 E-3	1.75 E-3	2.52 E-3	2.52 E-3	3.78 E-3	3.78 E-3
Static Friction	T_f	oz-in	0.30	0.30	0.70	0.70	1.00	1.00
		Nm	2.10 E-3	2.10 E-3	4.90 E-3	4.90 E-3	7.00 E-3	7.00 E-3
Motor Thermal Time Constant	τ_{th}	minutes	20	20	21.6	21.6	23.3	23.3
Electrical Time Constant	τ_{elec}	millisecs	0.31	0.30	0.39	0.39	0.42	0.41
Mechanical Time Constant	τ_{mch}	millisecs	9.5	12.2	7.2	6.5	5.4	5.8
Intermittent Torque Duration[9]	T_{2x}	seconds	11	11	18	18	20	20
Peak Torque Duration[10]	T_{3x}	seconds	4	4	6	6	7	7
Rotor Inertia	J	lb-in-sec^2	4.8 E-4	4.8 E-4	8.4 E-4	8.4 E-4	1.2 E-3	1.2 E-3
		kg-m^2	5.4 E-5	5.4 E-5	9.5 E-5	9.5 E-5	1.3 E-4	1.3 E-4
Number of Poles	Np		4	4	4	4	4	4
Weight	#	lbs	2.1	2.1	3.0	3.0	3.9	3.9
		kg	1.0	1.0	1.4	1.4	1.8	1.8
Winding Class			H	H	H	H	H	H

* SE Series not available with resolver.

1 *@ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate, @40°C ambient derate phase currents and torques by 12%.*
2 *Maximum speed is 7500RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, ±10% line-to-line*
4 *Value is mesured peak of sine wave.*
5 *±30%, Line-to-Line, inductance bridge measurement @ 1 kHz*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
8 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
9 *Maximum Time duration with 2 times rated applied with initial winding temp at 60°C.*
10 *Maximum Time duration with 3 times rated applied with initial winding temp at 60°C.*

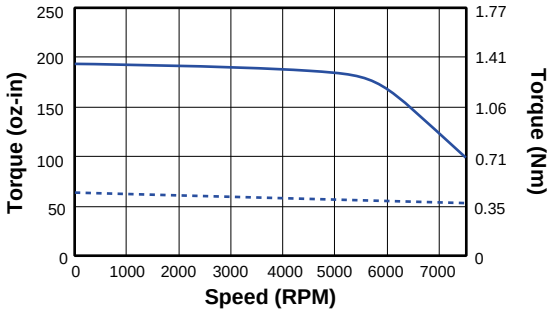
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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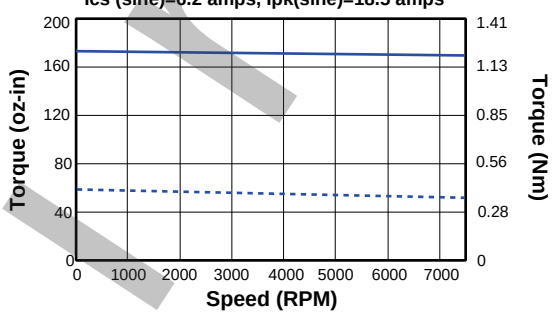
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Size 23, Resolver Feedback, Performance Curves
(SM Series only

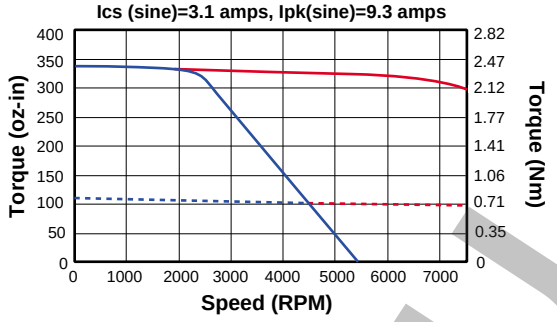
SM231AR
Ics (sine)=3.3 amps, Ipk(sine)=9.8 amps



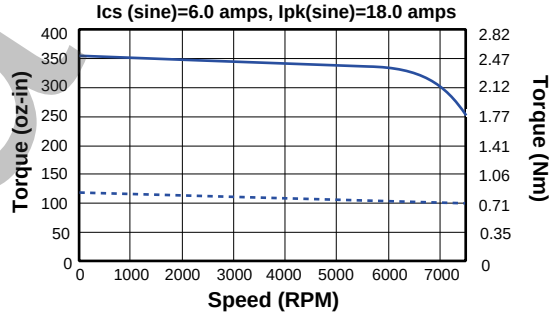
SM231BR
Ics (sine)=6.2 amps, Ipk(sine)=18.5 amps



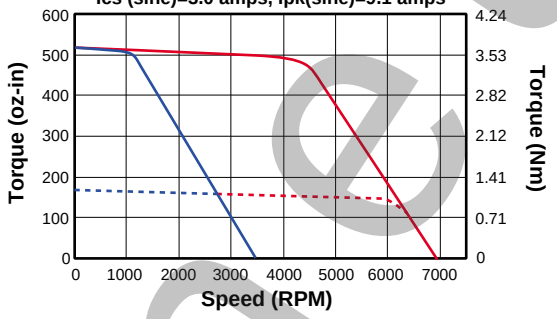
SM232AR
Ics (sine)=3.1 amps, Ipk(sine)=9.3 amps



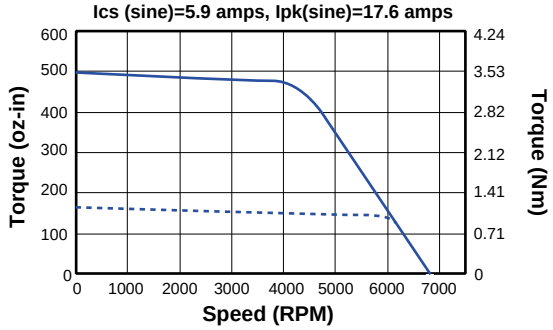
SM232BR
Ics (sine)=6.0 amps, Ipk(sine)=18.0 amps

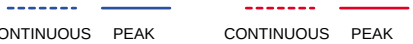


SM233AR
Ics (sine)=3.0 amps, Ipk(sine)=9.1 amps



SM233BR
Ics (sine)=5.9 amps, Ipk(sine)=17.6 amps





170 VDC 340 VDC

preview

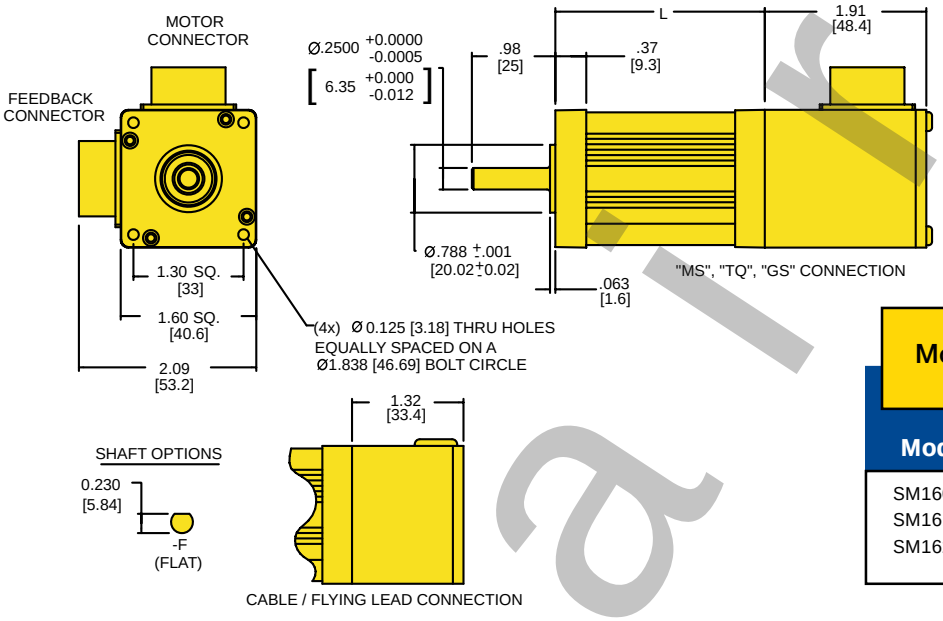
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SM Series Dimensional Drawings

Size 16, Dimensional Drawing

Dimensions in inches (mm)

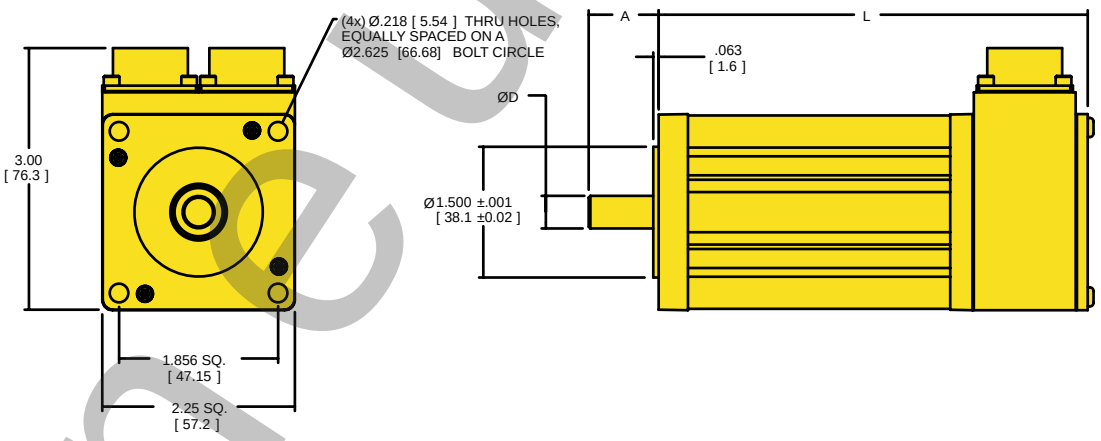


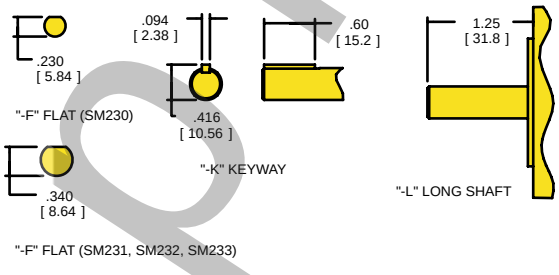
Motor Sizes

Model	Motor Length "L"
SM160	1.97 [50.0]
SM161	2.47 [62.7]
SM162	3.47 [88.1]

Size 23, Dimensional Drawing

Dimensions in inches (mm)





Motor Sizes

Model	Motor Length "L"	Shaft Length "A"	Shaft Diameter "D"
SM230	3.36 [85.3]	.78 [19.8]	.2500 +.0000/-.0005 [6.350 +0.000/-0.013]
SM231	3.98 [101.1]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]
SM232	4.98 [126.5]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]
SM233	5.98 [151.9]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]

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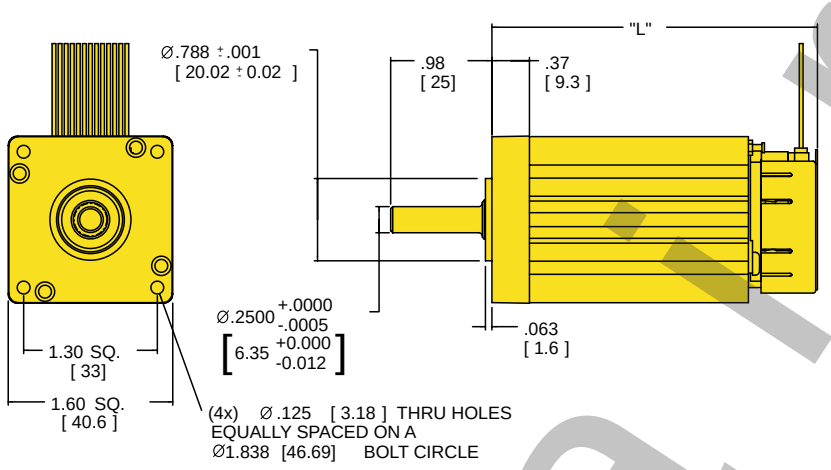
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SE Series Dimensional Drawings

Size 16, Dimensional Drawing

Dimensions in inches (mm)

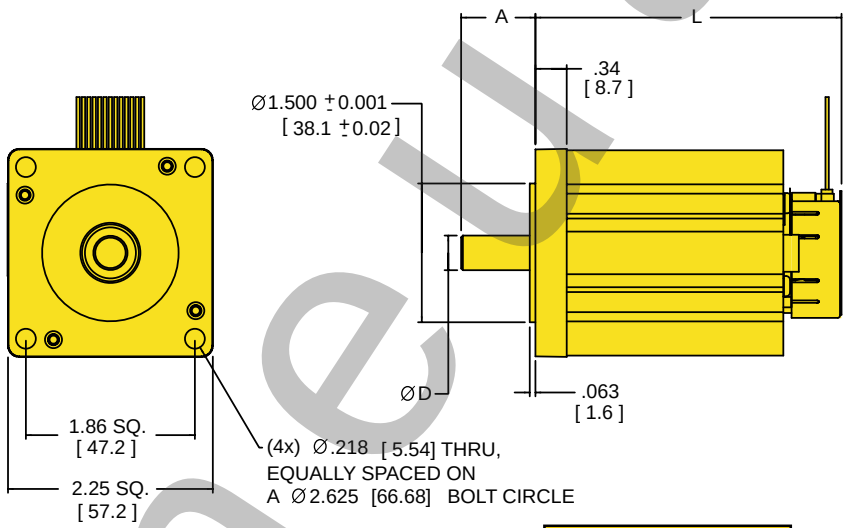


Motor Sizes

Model	Motor Length "L"
SE160	2.67 [67.8]
SE161	3.17 [80.5]
SE162	4.17 [105.9]

Size 23, Dimensional Drawing

Dimensions in inches (mm)



Motor Sizes

Model	Motor Length "L"	Shaft Length "A"	Shaft Diameter "D"
SE230	2.70 [68.6]	.78 [19.8]	.2500 +.0000/-.0005 [6.350 +0.000/-0.013]
SE231	3.36 [85.3]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]
SE232	4.36 [110.7]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]
SE233	5.36 [136.1]	.82 [20.8]	.3750 +.0000/-.0005 [9.525 +0.000/-0.013]

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Feedback Specifications

Encoder Specifications

Mechanical

Electrical

Accuracy	±2 min of arc
Input power	5 VDC ±5%, 135 mA
Operating frequency	100 kHz max
Output device	26LS31
Sink/Source, nominal	20 mA
Suggested user interface	26LS32

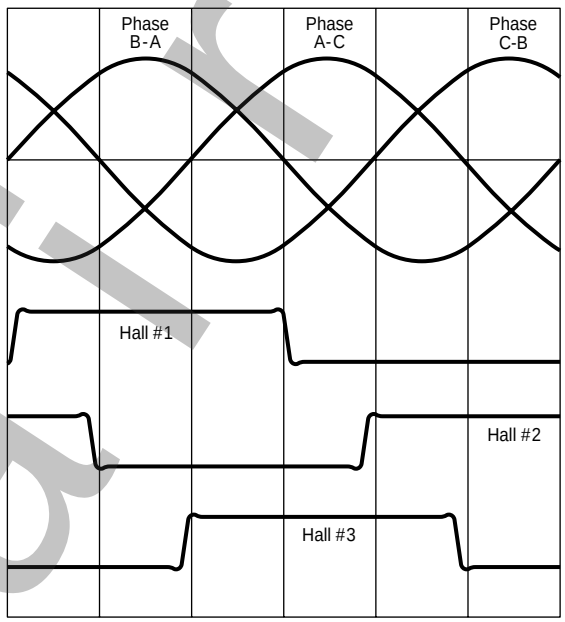
Hall-Effect Specifications

Electrical

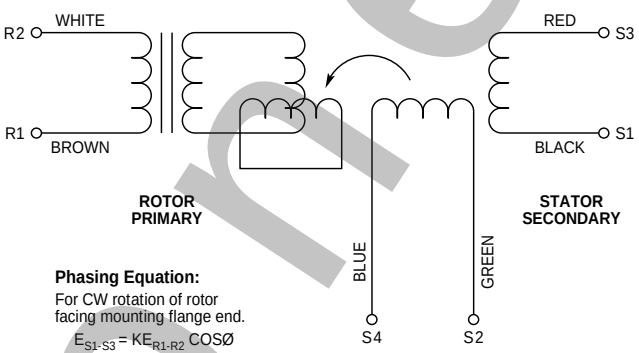
Input power	5 VDC ±5%, 80 mA
Output device (open collector)	LM339
Maximum pull up	12 VDC
Sink	16 mA

Commutation Chart

Clockwise rotation as viewed from front shaft.



Resolver Schematic Diagram for SM



Phasing Equation:
For CW rotation of rotor facing mounting flange end.

$E_{S1\text{-}S3} = KE_{R1\text{-}R2}\ COS\emptyset$

$E_{S2\text{-}S4} = KE_{R1\text{-}R2}\ SIN\emptyset$

Resolver Specifications

Parameter	Value
Input voltage @ 7 kHz	4.25 volts
Input current, max	55 mA
Input power, nominal	0.12 watts
Impedance ZSO (@ 90°)	58+j145 ohms
Impedance ZRO	53+j72 ohms
Impedance ZRS	42+j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
DC rotor resistance	23 ±10% ohms
DC stator resistance	19 ±10% ohms
Sensitivity	35 mV/degree
Max error from EZ	±10 minutes
Phase shift, open circuit	5° leading, ±3"
Null voltage, total	20 mV rms
Impedance ZSS	50+j128 ohms
Inertia	Incl. with motor spec.

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Wiring and Cable Specifications

Flying Leads, Cabled and "MS" Connection

Options

The **"FL" (Flying Lead) connection** option for the SM Series motors features 18" leads extending from the motor body. Wire color codes are the same as listed below for the "MS" connection option.

The **"10" and "25" connection** option for the SM Series motors consist of either 10 feet or 25 feet of jacketed cable extending from the motor body. These cables terminate in flying leads. Wire color codes are the same as listed below for the "MS" connection option.

The **"MS" connection** option for the SM Series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. With the "MS" connection option, the motor phase and temperature switch wires are in one cable/conector, and the hall and encoder signals are in the other cable/connector. This option works well when using an amplifier with a built-in controller, or when all cables enter into a cabinet or enclosure and then are wired into a terminal strip. When specifying the "R" (resolver) feedback option, the motor phase wires reside in one connector, the resolver signal and temperature switch wires in the other.

Encoder/Hall Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Hall Ground	K	White/Green
Hall +5	M	White/Blue
Hall 1	T	White/Brown
Hall 2	U	White/Orange
Hall 3	P	White/Violet
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue
Shield	N.C.	Clear
N.C.	N.C.	Orange/Yellow
N.C.	N.C.	Orange/Yellow

Motor Connection

Designation	Pin Number MS14-12	Wire Color
Phase A	J	Red/Yellow
Phase B	K	White/Yellow
Phase C	L	Black/Yellow
Ground	M	Green/Yellow
Temp[2]	G	Orange/Yellow or Yellow
Temp[2]	H	Orange/Yellow or Yellow
Shield	N.C.	Clear

Resolver Feedback Connection

Designation	Pin Number MS14-18	Wire Color
S1, COS +	E	Black
S2, SIN +	L	Green
S3, COS -	J	Red
S4, SIN -	G	Blue
R1, EXC +	C	Brown
R2, EXC -	U	White
Temp[2]	R	Orange/Yellow or Yellow
Temp[2]	N	Orange/Yellow or Yellow
Brake[1]	S	Red/Blue
Brake[1]	T	Red/Blue
Shield	N.C.	Clear

1 *Brake will operate regardless of polarity connection*
2 *For motors with the "R" (resolver) feedback option, the temperature switch is connected to leads in the feedback cable/connector*

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Wiring and Cable Specifications (Continued)

"GS" Connection Option

The **"GS"** connection option for the SM Series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. Wiring for the "GS" connection option for SM motors is similar to the "MS" option, except the temperature switch leads have been moved to the feedback connector. This connection option should be selected when operating the SM motors with the Gemini family of amplifiers.

Motor Connection

Designation	Pin Number MS14-12	Wire Color
Phase A	J	Black 1
Phase B	K	Black 2
Phase C	L	Black 3
Ground	M	Green/Yellow

Encoder/Hall Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Hall Ground	K	White/Green
Hall +5	M	White/Blue
Hall 1	T	White/Brown
Hall 2	U	White/Orange
Hall 3	P	White/Violet
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue
Temp	L	Orange/Yellow
Temp	N	Orange/Yellow

1 Brake will operate regardless of polarity connection

"TQ" Connection Option

The **"TQ"** connection option for the SM Series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. The "TQ" connection option joins the motor phase, hall effect and temperature switch wires in one connector. The second connector has only encoder signals. This connection option applies well in applications where the hall and motor phase wires connect directly to an amplifier, while the encoder signals connect directly to a controller.

Motor/HallConnection

Designation	Pin Number MS14-12	Wire Color
Phase A	J	Red/Yellow
Phase B	K	White/Yellow
Phase C	L	Black/Yellow
Ground	M	Green/Yellow
Temp	G	Orange/Yellow or Yellow
Temp	H	Orange/Yellow or Yellow
Hall Ground	F	White/Green
Hall +5	B	White/Blue
Hall 1	C	White/Brown
Hall 2	D	White/Orange
Hall 3	E	White/Violet
Shield	N.C.	Clear

Encoder Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue
Shield	N.C.	Clear

1 Brake will operate regardless of polarity of connection

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BE Series Motors



High-Torque Design, Low-Cost Package

Compumotor's BE Series brushless servo motors produce high continuous stall torque in a cost-reduced package.

The increased torque of the BE Series motors is the result of an increased number of magnetic poles on the rotor. Traditional motors in these frame sizes have four magnetic poles on the rotor, while the BE Series motors have eight poles.

The cost reduction of the BE Series motors is achieved from their open lamination design. Unlike traditional servo motors, the BE Series motors do not have a metal housing. Instead, the laminations of the motor stator are shaped into the body of the motor. This design reduces both material costs and time required assembling the motor.

The BE Series motors are created using Compumotor's proven bridged stator design. This two-piece lamination design simplifies the manufacturing process, creating further cost savings. The bridged stator construction also results in less audible noise being generated by the motor.

The BE Series servo motors are available with integrated planetary gearheads in ratios up to 100:1. Our unique package integrates the gearhead pinion into the motor shaft, reducing the overall package length by up to 2 inches.

Features

- Size 16, 23 and 34
- 1.4 to 46 lb-in continuous torque
- Brushless construction
- High torque density packaging
- Bridged stator design - quiet operation
- High performance neodymium magnets
- Thermoswitch protection
- 2000 line encoder standard
- Resolver feedback option
- Connectorization choices
- 10-day deliveries
- Two year warranty
- CAD (.dxf) drawings available
- CE compliant

Part Numbering System

BE	342	H	J-	N	MS	N
BE Series	*Frame, Magnet Length* 161 230 341 162 231 342 163 232 343 164 233 344	*Winding* Identifying character C, D, F, J, K, L, etc.	*Feedback* J - 2000 ppr encoder R - Resolver[3]	*Shafting* N - Normal F - Flat K - Keyway[3]	*Connection* FO[1] - Flying leads w/ plastic encoder cover FL[1] - Flying leads w/ connector housing 10[1] - 10' cable MS[2] - Military style TQ[1,2] - Trap drive	*Options* N - None B - Brake[3] GXX - Gearhead[3,4]

1 *Encoder feedback motors only*
2 *Refer to "Wiring and Cable Specifications" section for connector wiring*
3 *Not available on size 16*
4 *Specify "K" shaft option with gearheads*

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Size 16, Encoder Feedback, Specifications

Parameter	Symbol	Units	BE161C	BE161D	BE161F	BE162C	BE162D	BE162F
Stall Torque Continous[1]	T_{cs}	lb-in	1.3	1.4	1.4	2.3	2.5	2.4
		oz-in	21	23	22	37	39	39
		Nm	0.15	0.16	0.15	0.26	0.28	0.27
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	2.9	4.6	6.9	3.0	4.5	6.8
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.5	4.0	6.0	2.6	3.9	5.9
Peak Torque[6]	T_{pk}	lb-in	4.0	4.2	4.1	6.9	7.4	7.2
		oz-in	64	68	66	111	118	116
		Nm	0.45	0.47	0.46	0.78	0.83	0.81
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	8.6	13.7	20.8	9.1	13.4	20.4
Peak Current[6,7]	I_{pk}(trap)	Amps DC	7.4	11.9	18.0	7.9	11.6	17.7
Rated Speed[2]	w_r	rpm	5000	5000	5000	5000	5000	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	2.8	4.5	6.9	3.0	4.4	6.7
Current @ Rated Speed	I_r(trap)	Amps	2.5	3.9	5.9	2.6	3.8	5.8
Torque @ Rated Speed	T_r	lb-in	1.3	1.4	1.3	2.2	2.4	2.4
		oz-in	21	22	21	36	38	38
		Nm	0.14	0.15	0.15	0.25	0.27	0.26
Shaft Power @ Rated Speed	P_o	watts	76	80	78	131	140	140
Voltage Constant[3,4]	K_b	Volts/rad/s	0.061	0.040	0.026	0.100	0.072	0.046
Voltage Constant[3,4]	K_e	Volts/Krpm	6.38	4.22	2.69	10.42	7.55	4.85
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	7.47	4.94	3.15	12.20	8.84	5.68
		Nm/Amp Peak	0.052	0.035	0.022	0.085	0.062	0.040
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	8.62	5.71	3.64	14.09	10.21	6.56
		Nm/Amp DC	0.060	0.040	0.025	0.099	0.071	0.046
Resistance[3]	R	Ohms	4.31	1.71	0.74	4.38	2.03	0.87
Inductance[5]	L	mH	12.10	5.30	2.16	16.14	8.46	3.50
Maximum Bus Voltage	V_m	Volts DC	170	170	170	170	170	170
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	2.70	2.70	2.70	2.37	2.37	2.37
Motor Constant	K_m	oz-in/√watt	4.15	4.36	4.23	6.73	7.17	7.03
		Nm/√watt	0.029	0.031	0.030	0.047	0.050	0.049
Viscous Damping	B	oz-in/Krpm	0.050	0.050	0.050	0.060	0.060	0.060
		Nm/Krpm	3.5E-04	3.5E-04	3.5E-04	4.2E-04	4.2E-04	4.2E-04
Static Friction	T_f	oz-in	0.25	0.25	0.25	0.40	0.40	0.40
		Nm	1.8E-03	1.8E-03	1.8E-03	2.8E-03	2.8E-03	2.8E-03
Motor Thermal Time Constant	t_{th}	minutes	8.3	8.3	8.3	8.3	8.3	8.3
Electrical Time Constant	t_{elec}	millisecs	2.81	3.10	2.92	3.68	4.17	4.02
Mechanical Time Constant	t_{mch}	millisecs	1.4	1.3	1.4	0.9	0.8	0.8
Intermittent Torque Duration[10]	T_{2x}	seconds	27	27	27	39	39	39
Peak Torque Duration[11]	T_{3x}	seconds	11	11	11	16	16	16
Rotor Inertia	J	lb-in-sec^2	1.1E-05	1.1E-05	1.1E-05	1.8E-05	1.8E-05	1.8E-05
		kg-m^2	1.2E-06	1.2E-06	1.2E-06	2.0E-06	2.0E-06	2.0E-06
Number of Poles	Np		8	8	8	8	8	8
Motor Weight	#	lbs	0.6	0.6	0.6	0.8	0.8	0.8
		kg	0.3	0.3	0.3	0.3	0.3	0.3
Winding Class			H	H	H	H	H	H

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 6%.*
2 *Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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Size 16, Encoder Feedback, Specifications

Parameter	Symbol	Units	BE163C	BE163D	BE163F	BE164C	BE164D	BE164F
Stall Torque Continous[1]	T_{cs}	lb-in	2.9	3.0	3.0	3.6	3.8	3.8
		oz-in	47	48	48	58	61	61
		Nm	0.33	0.34	0.33	0.40	0.43	0.42
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	2.9	4.0	6.3	3.0	3.8	6.0
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.5	3.5	5.4	2.6	3.3	5.2
Peak Torque[6]	T_{pk}	lb-in	8.8	9.1	8.9	10.8	11.4	11.4
		oz-in	142	145	143	173	183	182
		Nm	0.99	1.01	1.00	1.21	1.28	1.27
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	8.6	12.1	18.8	9.1	11.4	18.0
Peak Current[6,7]	I_{pk}(trap)	Amps DC	7.5	10.5	16.3	7.9	9.9	15.6
Rated Speed[2]	w_r	rpm	5000	5000	5000	5000	5000	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	2.8	3.9	6.1	2.9	3.7	5.8
Current @ Rated Speed	I_r(trap)	Amps	2.4	3.4	5.3	2.5	3.2	5.0
Torque @ Rated Speed	T_r	lb-in	2.8	2.9	2.8	3.4	3.6	3.6
		oz-in	45	46	45	54	57	57
		Nm	0.31	0.32	0.32	0.38	0.40	0.40
Shaft Power @ Rated Speed	P_o	watts	165	169	166	200	212	211
Voltage Constant[3,4]	K_b	Volts/rad/s	0.134	0.098	0.062	0.154	0.130	0.082
Voltage Constant[3,4]	K_e	Volts/Krpm	14.01	10.24	6.47	16.17	13.66	8.63
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	16.41	11.99	7.58	18.93	15.99	10.10
		Nm/Amp Peak	0.115	0.084	0.053	0.133	0.112	0.071
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	18.95	13.85	8.75	21.86	18.46	11.67
		Nm/Amp DC	0.133	0.097	0.061	0.153	0.129	0.082
Resistance[3]	R	Ohms	4.77	2.42	1.00	4.65	2.98	1.20
Inductance[5]	L	mH	19.45	10.39	4.15	19.43	13.86	5.53
Maximum Bus Voltage	V_m	Volts DC	170	170	170	170	170	170
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	2.43	2.43	2.43	2.21	2.21	2.21
Motor Constant	K_m	oz-in/√watt	8.67	8.90	8.75	10.14	10.70	10.65
		Nm/√watt	0.061	0.062	0.061	0.071	0.075	0.075
Viscous Damping	B	oz-in/Krpm	0.070	0.070	0.070	0.080	0.080	0.080
		Nm/Krpm	4.9E-04	4.9E-04	4.9E-04	5.6E-04	5.6E-04	5.6E-04
Static Friction	T_f	oz-in	0.60	0.60	0.60	0.80	0.80	0.80
		Nm	4.2E-03	4.2E-03	4.2E-03	5.6E-03	5.6E-03	5.6E-03
Motor Thermal Time Constant	t_{th}	minutes	10.0	10.0	10.0	11.6	11.6	11.6
Electrical Time Constant	t_{elec}	millisecs	4.08	4.29	4.15	4.18	4.65	4.61
Mechanical Time Constant	t_{mch}	millisecs	0.7	0.7	0.7	0.7	0.6	0.6
Intermittent Torque Duration[10]	T_{2x}	seconds	52	52	52	58	58	58
Peak Torque Duration[11]	T_{3x}	seconds	20	20	20	23	23	23
Rotor Inertia	J	lb-in-sec^2	2.4E-05	2.4E-05	2.4E-05	3.1E-05	3.1E-05	3.1E-05
		kg-m^2	2.7E-06	2.7E-06	2.7E-06	3.5E-06	3.5E-06	3.5E-06
Number of Poles	Np		8	8	8	8	8	8
Motor Weight	#	lbs	1.1	1.1	1.1	1.3	1.3	1.3
		kg	0.5	0.5	0.5	0.6	0.6	0.6
Winding Class			H	H	H	H	H	H

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 6%.*
2 *Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

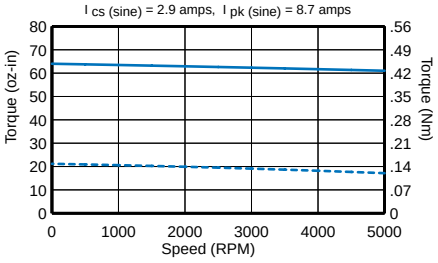
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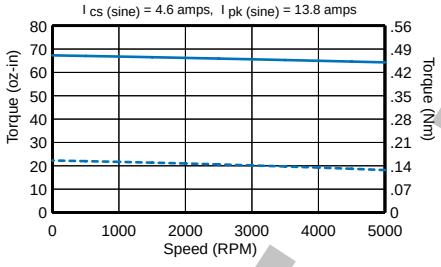
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Size 16, Encoder Feedback, Performance Curves

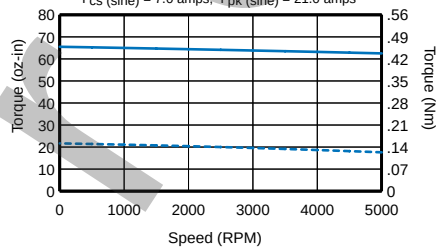
BE161CJ
$I_{cs\ (sine)}$ = 2.9 amps, $I_{pk\ (sine)}$ = 8.7 amps



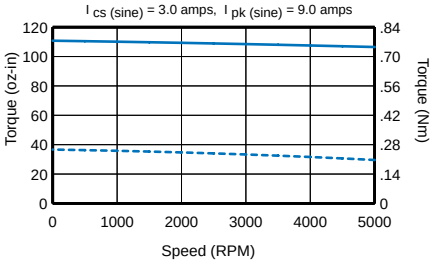
BE161DJ
$I_{cs\ (sine)}$ = 4.6 amps, $I_{pk\ (sine)}$ = 13.8 amps



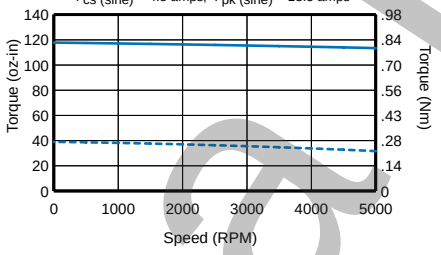
BE161FJ
$I_{cs\ (sine)}$ = 7.0 amps, $I_{pk\ (sine)}$ = 21.0 amps



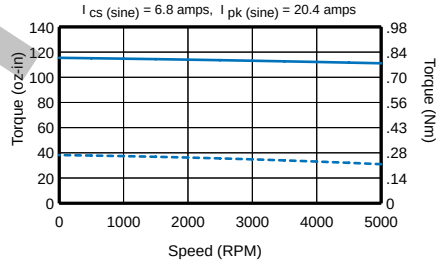
BE162CJ
$I_{cs\ (sine)}$ = 3.0 amps, $I_{pk\ (sine)}$ = 9.0 amps



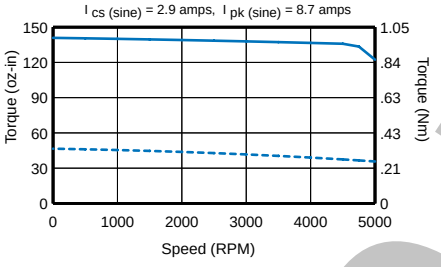
BE162DJ
$I_{cs\ (sine)}$ = 4.5 amps, $I_{pk\ (sine)}$ = 13.5 amps



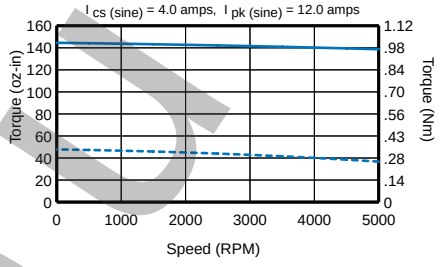
BE162FJ
$I_{cs\ (sine)}$ = 6.8 amps, $I_{pk\ (sine)}$ = 20.4 amps



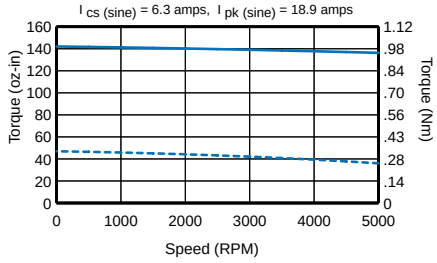
BE163CJ
$I_{cs\ (sine)}$ = 2.9 amps, $I_{pk\ (sine)}$ = 8.7 amps



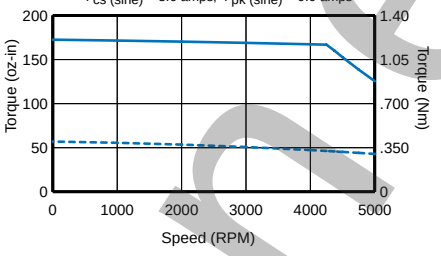
BE163DJ
$I_{cs\ (sine)}$ = 4.0 amps, $I_{pk\ (sine)}$ = 12.0 amps



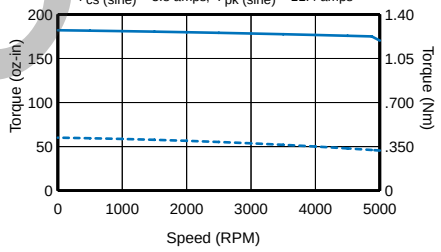
BE163FJ
$I_{cs\ (sine)}$ = 6.3 amps, $I_{pk\ (sine)}$ = 18.9 amps



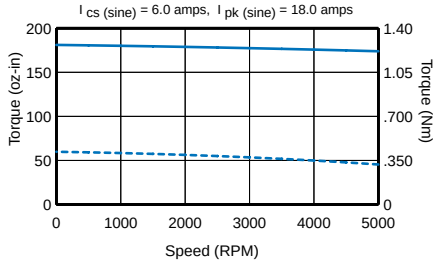
BE164CJ
$I_{cs\ (sine)}$ = 3.0 amps, $I_{pk\ (sine)}$ = 9.0 amps



BE164DJ
$I_{cs\ (sine)}$ = 3.8 amps, $I_{pk\ (sine)}$ = 11.4 amps



BE164FJ
$I_{cs\ (sine)}$ = 6.0 amps, $I_{pk\ (sine)}$ = 18.0 amps



CONTINUOUS (170VDC) PEAK

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Size 23, Encoder Feedback, Specifications

Parameter	Symbol	Units	BE230D	BE230F	BE231D	BE231F	BE232D	BE232F	BE233D	BE233F
Stall Torque Continous[1]	T_{cs}	lb-in	3.4	3.3	6.0	5.9	9.9	9.7	13.0	13.3
		oz-in	54	53	96	94	159	155	207	213
		Nm	0.38	0.37	0.67	0.66	1.11	1.08	1.45	1.49
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	3.1	6.1	2.8	5.3	2.8	5.4	2.5	4.9
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.7	5.3	2.4	4.6	2.4	4.7	2.2	4.2
Peak Torque[6]	T_{pk}	lb-in	10.1	10.0	18.0	17.7	29.7	29.0	38.9	40.0
		oz-in	161	160	289	283	476	464	622	640
		Nm	1.13	1.12	2.02	1.98	3.33	3.25	4.35	4.48
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	9.4	18.2	8.2	15.9	8.4	16.3	7.4	14.6
Peak Current[6,7]	I_{pk}(trap)	Amps DC	8.1	15.8	7.1	13.8	7.3	14.1	6.5	12.7
Rated Speed[2]	ω_r	rpm	5000	5000	5000	5000	5000	5000	3750	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	2.9	5.6	2.5	4.7	2.4	4.7	2.2	4.0
Current @ Rated Speed	I_r(trap)	Amps	2.5	4.8	2.1	4.1	2.1	4.1	1.9	3.5
Torque @ Rated Speed	T_r	lb-in	2.9	2.9	5.2	5.1	8.2	8.0	11.3	10.7
		oz-in	47	47	83	81	131	128	180	171
		Nm	0.33	0.33	0.58	0.57	0.92	0.90	1.26	1.20
Shaft Power @ Rated Speed	P_o	watts	174	174	307	300	484	473	499	632
Voltage Constant[3,4]	K_b	Volts/rad/s	0.140	0.072	0.286	0.145	0.461	0.232	0.681	0.357
Voltage Constant[3,4]	K_e	Volts/Krpm	14.66	7.53	29.90	15.18	48.28	24.29	71.30	37.41
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	17.17	8.82	35.01	17.78	56.53	28.45	83.50	43.80
		Nm/Amp Peak	0.120	0.062	0.245	0.124	0.396	0.199	0.584	0.307
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	19.82	10.18	40.43	20.53	65.28	32.85	96.42	50.58
		Nm/Amp DC	0.139	0.071	0.283	0.144	0.457	0.230	0.675	0.354
Resistance[3]	R	Ohms	4.57	1.22	6.97	1.86	7.72	2.05	10.98	2.85
Inductance[5]	L	mH	15.43	4.10	32.30	8.65	42.66	11.12	61.39	16.28
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	2.14	2.14	1.82	1.82	1.58	1.58	1.41	1.41
Motor Constant	K_m	oz-in/√watt	9.27	9.22	15.31	15.05	23.49	22.94	29.10	29.96
		Nm/√watt	0.065	0.065	0.107	0.105	0.164	0.161	0.204	0.210
Viscous Damping	B	oz-in/Krpm	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.7
		Nm/Krpm	1.8E-03	1.8E-03	2.5E-03	2.5E-03	3.5E-03	3.5E-03	4.9E-03	4.9E-03
Static Friction	T_f	oz-in	0.8	0.8	1.3	1.3	2.0	2.0	2.5	2.5
		Nm	5.3E-03	5.3E-03	8.8E-03	8.8E-03	1.4E-02	1.4E-02	1.8E-02	1.8E-02
Motor Thermal Time Constant	τ_{th}	minutes	11.6	11.6	13.3	13.3	15.0	15.0	20.0	20.0
Electrical Time Constant	τ_{elec}	millisecs	3.38	3.36	4.63	4.65	5.53	5.42	5.59	5.71
Mechanical Time Constant	τ_{mch}	millisecs	1.2	1.2	0.8	0.8	0.6	0.6	0.6	0.5
Intermittent Torque Duration[10]	T_{2x}	seconds	37	37	47	47	58	58	62	62
Peak Torque Duration[11]	T_{3x}	seconds	15	15	18	18	22	22	23	23
Rotor Inertia	J	lb-in-sec²	4.6E-05	4.6E-05	8.0E-05	8.0E-05	1.5E-04	1.5E-04	2.1E-04	2.1E-04
		kg-m²	5.2E-06	5.2E-06	9.0E-06	9.0E-06	1.7E-05	1.7E-05	2.4E-05	2.4E-05
Number of Poles	Np		8	8	8	8	8	8	8	8
Motor Weight	#	lbs	1.5	1.5	2.0	2.0	3.1	3.1	4.2	4.2
		kg	0.7	0.7	0.9	0.9	1.4	1.4	1.9	1.9
Winding Class			H	H	H	H	H	H	H	H

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 12%.*
2 *Operation with 340 VDC bus. Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusiodal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

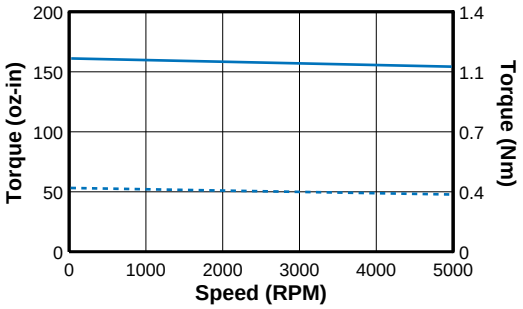
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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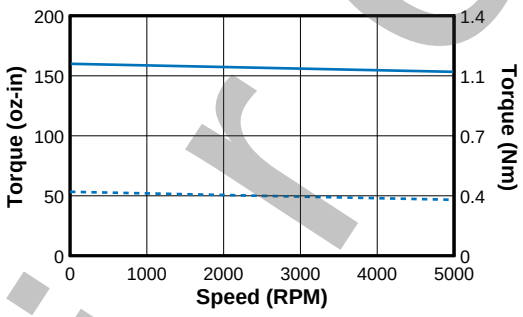
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Size 23, Encoder Feedback, Performance Curves

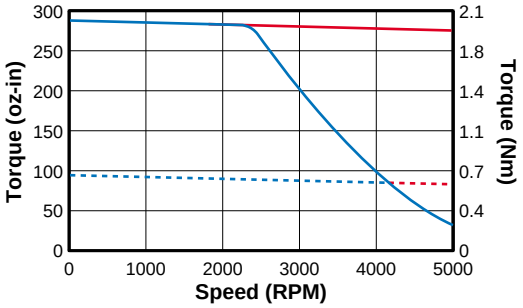
BE230DJ
Ics (sine)=3.1 amps, Ipk(sine)=9.4 amps



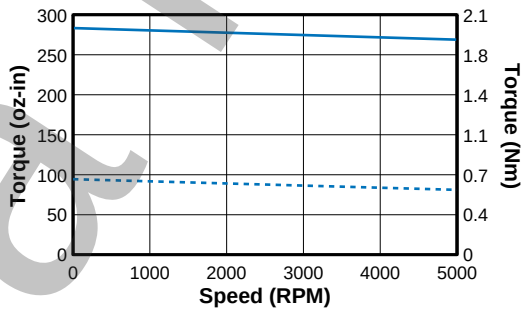
BE230FJ
Ics (sine)=6.1 amps, Ipk(sine)=18.2 amps



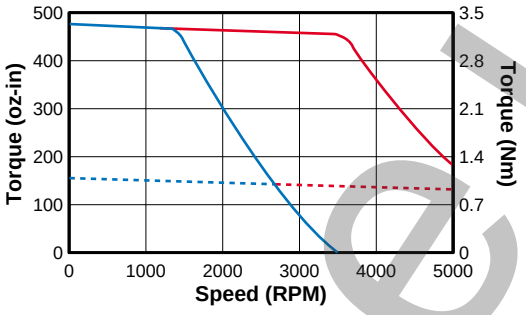
BE231DJ
Ics (sine)=2.8 amps, Ipk(sine)=8.2 amps



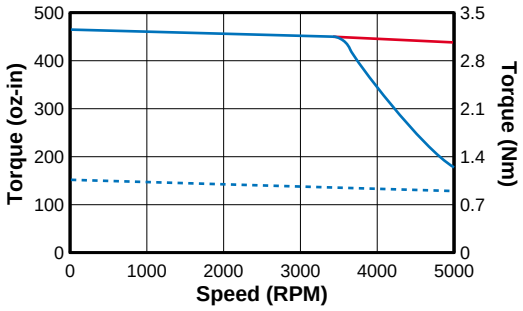
BE231FJ
Ics (sine)=5.3 amps, Ipk(sine)=15.9 amps



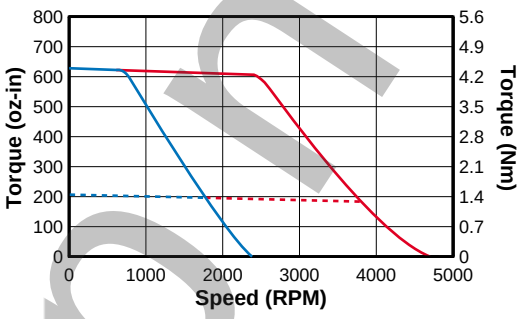
BE232DJ
Ics (sine)=2.8 amps, Ipk(sine)=8.4 amps



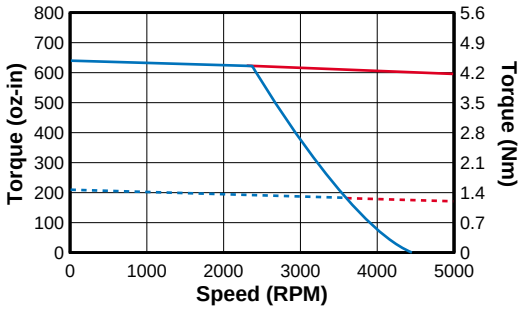
BE232FJ
Ics (sine)=5.4 amps, Ipk(sine)=16.3 amps



BE233DJ
Ics (sine)=2.5 amps, Ipk(sine)=7.5 amps



BE233FJ
Ics (sine)=4.9 amps, Ipk(sine)=14.6 amps





170 VDC 340 VDC

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Size 23, Resolver Feedback, Specifications

Parameter	Symbol	Units	BE230D	BE230F	BE231D	BE231F	BE232D	BE232F	BE233D	BE233F
Stall Torque Continous[1]	T_{cs}	lb-in	3.6	3.6	6.5	6.4	10.7	10.5	14.0	14.4
		oz-in	58	58	104	102	171	167	225	231
		Nm	0.41	0.40	0.73	0.71	1.20	1.17	1.57	1.61
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	3.4	6.6	3.0	5.7	3.0	5.9	2.7	5.3
Peak Torque[6]	T_{pk}	lb-in	10.9	10.8	19.5	19.1	32.1	31.4	42.1	43.2
		oz-in	174	173	312	306	513	502	674	692
		Nm	1.22	1.21	2.18	2.14	3.59	3.51	4.72	4.84
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	10.1	19.7	8.9	17.2	9.1	17.6	8.1	15.8
Rated Speed[2]	ω_r	rpm	5000	5000	5000	5000	5000	5000	3625	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	3.2	6.1	2.7	5.3	2.7	5.2	2.5	4.6
Torque @ Rated Speed	T_r	lb-in	3.3	3.3	5.8	5.6	9.3	9.0	12.6	12.1
		oz-in	52	52	92	90	148	144	201	194
		Nm	0.36	0.36	0.64	0.63	1.04	1.01	1.41	1.36
Shaft Power @ Rated Speed	P_o	watts	192	192	340	333	547	533	539	717
Voltage Constant[3,4]	K_b	Volts/rad/s	0.140	0.072	0.286	0.145	0.461	0.232	0.681	0.357
Voltage Constant[3,4]	K_e	Volts/Krpm	14.66	7.53	29.90	15.18	48.28	24.29	71.30	37.41
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	17.17	8.82	35.01	17.78	56.53	28.45	83.50	43.80
		Nm/Amp Peak	0.120	0.062	0.245	0.124	0.396	0.199	0.584	0.307
Resistance[3]	R	Ohms	4.57	1.22	6.97	1.86	7.72	2.05	10.98	2.85
Inductance[5]	L	mH	15.43	4.10	32.30	8.65	42.66	11.12	61.39	16.28
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	2.14	2.14	1.82	1.82	1.58	1.58	1.41	1.41
Motor Constant	K_m	oz-in/√watt	9.27	9.22	15.31	15.05	23.49	22.94	29.10	29.96
		Nm/√watt	0.065	0.065	0.107	0.105	0.164	0.161	0.204	0.210
Viscous Damping	B	oz-in/Krpm	0.3	0.3	0.4	0.4	0.5	0.5	0.7	0.7
		Nm/Krpm	1.8E-03	1.8E-03	2.5E-03	2.5E-03	3.5E-03	3.5E-03	4.9E-03	4.9E-03
Static Friction	T_f	oz-in	0.8	0.8	1.3	1.3	2.0	2.0	2.5	2.5
		Nm	5.3E-03	5.3E-03	8.8E-03	8.8E-03	1.4E-02	1.4E-02	1.8E-02	1.8E-02
Motor Thermal Time Constant	τ_{th}	minutes	11.6	11.6	13.3	13.3	15.0	15.0	20.0	20.0
Electrical Time Constant	τ_{elec}	millisecs	3.38	3.36	4.63	4.65	5.53	5.42	5.59	5.71
Mechanical Time Const.	τ_{mch}	millisecs	1.2	1.2	0.8	0.8	0.6	0.6	0.6	0.5
Intermittent Torque Duration[10]	T_{2x}	seconds	37	37	47	47	58	58	62	62
Peak Torque Duration[11]	T_{3x}	seconds	15	15	18	18	22	22	23	23
Rotor Inertia	J	lb-in-sec^2	4.6E-05	4.6E-05	8.0E-05	8.0E-05	1.5E-04	1.5E-04	2.1E-04	2.1E-04
		kg-m^2	5.2E-06	5.2E-06	9.0E-06	9.0E-06	1.7E-05	1.7E-05	2.4E-05	2.4E-05
Number of Poles	Np		8	8	8	8	8	8	8	8
Motor Weight	#	lbs	1.5	1.5	2.0	2.0	3.1	3.1	4.2	4.2
		kg	0.7	0.7	0.9	0.9	1.4	1.4	1.9	1.9
Winding Class			H	H	H	H	H	H	H	H

1 *@ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 12%.*
2 *Operation with 340 VDC bus. Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before Peak Current is Applied.*
7 *Peak of the sinusiodal current in any phase for a sinusiodally comutated motor.*
8 *Total motor torque per peak of the sinusiodal amps measured in any phase, +/-10%.*
9 *Maximum Time duration with 2 times rated current applied with initial winding temp at 60°C.*
10 *Maximum Time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

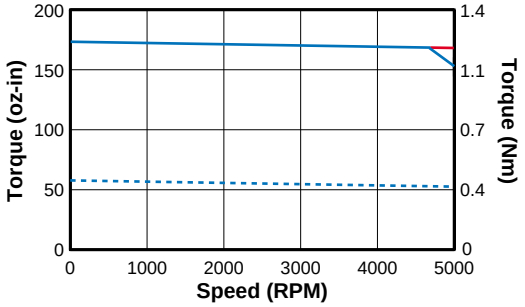
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Size 23, Resolver Feedback, Performance Curves

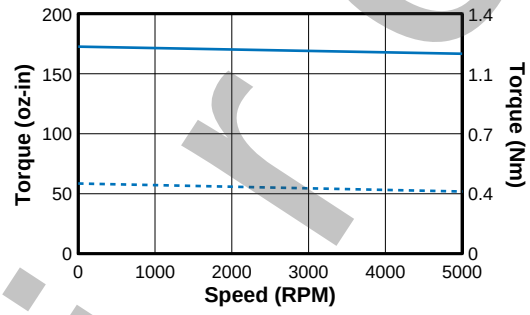
BE230DR

Ics (sine)=3.4 amps, Ipk(sine)=10.1 amps



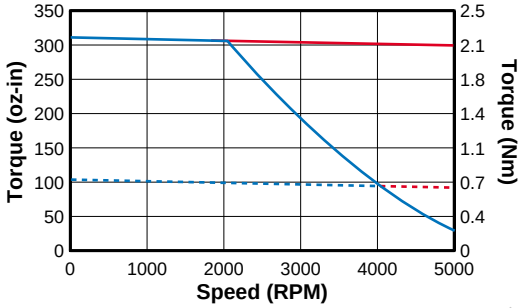
BE230FR

Ics (sine)=6.6 amps, Ipk(sine)=19.7 amps



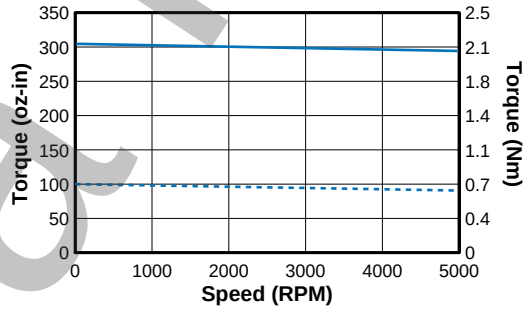
BE231DR

Ics (sine)=3.0 amps, Ipk(sine)=8.9 amps



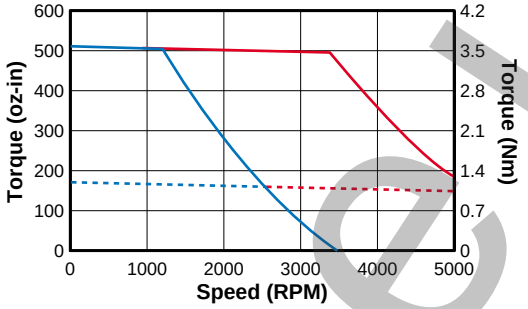
BE231FR

Ics (sine)=5.7 amps, Ipk(sine)=17.2 amps



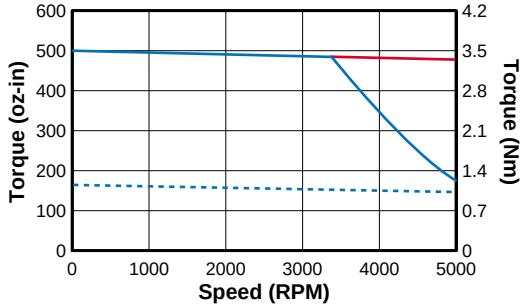
BE232DR

Ics (sine)=3.0 amps, Ipk(sine)=9.1 amps



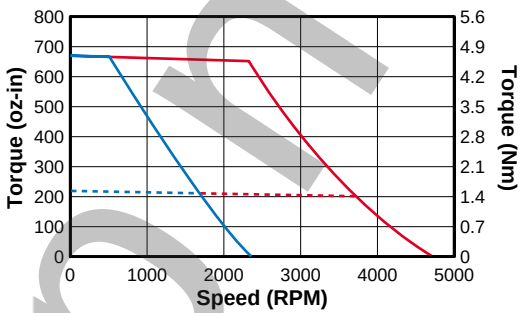
BE232FR

Ics (sine)=5.9 amps, Ipk(sine)=17.6 amps



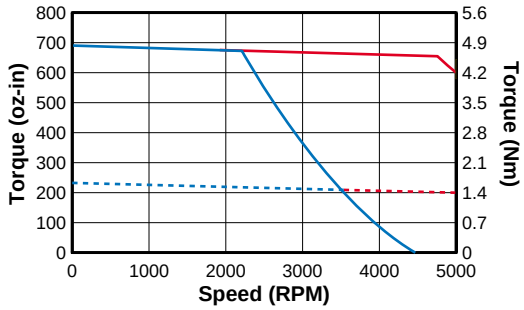
BE233DR

Ics (sine)=2.7 amps, Ipk(sine)=8.1 amps



BE233FR

Ics (sine)=5.3 amps, Ipk(sine)=15.8 amps



CONTINUOUS PEAK — **170 VDC**

CONTINUOUS PEAK — **340 VDC**

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Size 34, Encoder Feedback, Specifications

Parameter	Symbol	Units	BE341F	BE341J	BE342H	BE342K	BE343J	BE343L	BE344J	BE344L
Stall Torque Continous[1]	T_{cs}	lb-in	15.0	14.9	25.3	25.7	35.6	35.4	43.3	42.9
		oz-in	241	239	406	411	570	566	693	686
		Nm	1.68	1.67	2.84	2.88	3.99	3.96	4.85	4.80
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	5.1	10.4	6.9	13.5	9.9	15.8	9.1	14.3
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	4.5	9.0	5.9	11.7	8.6	13.7	7.8	12.4
Peak Torque[6]	T_{pk}	lb-in	45.1	44.8	76.0	77.1	106.9	106.1	129.9	128.6
		oz-in	722	717	1217	1233	1710	1697	2078	2058
		Nm	5.05	5.02	8.52	8.63	11.97	11.88	14.55	14.40
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	15.4	31.3	20.6	40.4	29.8	47.4	27.2	43.0
Peak Current[6,7]	I_{pk}(trap)	Amps DC	13.4	27.1	17.8	35.0	25.8	41.0	23.5	37.3
Rated Speed[2]	ω_r	rpm	4625	5000	4500	5000	4375	5000	3500	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	4.2	8.3	5.5	10.3	7.8	11.5	7.6	9.9
Current @ Rated Speed	I_r(trap)	Amps	3.7	7.2	4.8	8.9	6.8	9.9	6.6	8.5
Torque @ Rated Speed	T_r	lb-in	11.9	11.4	20.3	19.1	27.7	24.8	35.6	28.5
		oz-in	191	182	325	305	443	397	569	456
		Nm	1.34	1.27	2.28	2.14	3.10	2.78	3.98	3.19
Shaft Power @ Rated Speed	P_o	watts	653	673	1082	1128	1434	1468	1473	1686
Voltage Constant[3,4]	K_b	Volts/rad/s	0.382	0.187	0.483	0.249	0.468	0.292	0.624	0.390
Voltage Constant[3,4]	K_e	Volts/Krpm	40.00	19.58	50.58	26.08	49.01	30.58	65.35	40.84
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	46.84	22.93	59.23	30.53	57.39	35.81	76.52	47.83
		Nm/Amp Peak	0.328	0.161	0.415	0.214	0.402	0.251	0.536	0.335
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	54.09	26.48	68.39	35.26	66.27	41.35	88.36	55.22
		Nm/Amp DC	0.379	0.185	0.479	0.247	0.464	0.289	0.619	0.387
Resistance[3]	R	Ohms	2.59	0.63	1.70	0.44	0.96	0.38	1.23	0.49
Inductance[5]	L	mH	35.40	7.07	21.50	5.84	15.09	6.86	20.17	7.32
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.40	1.40	1.20	1.20	1.01	1.01	0.95	0.95
Motor Constant	K_m	oz-in/√watt	33.61	33.36	52.45	53.15	67.64	67.07	79.67	78.89
		Nm/√watt	0.235	0.234	0.367	0.372	0.473	0.470	0.558	0.552
Viscous Damping	B	oz-in/Krpm	1.1	1.1	1.3	1.3	1.7	1.7	2.0	2.0
		Nm/Krpm	7.6E-03	7.6E-03	9.3E-03	9.3E-03	1.2E-02	1.2E-02	1.4E-02	1.4E-02
Static Friction	T_f	oz-in	1.7	1.7	2.7	2.7	4.2	4.2	5.0	5.0
		Nm	1.2E-02	1.2E-02	1.9E-02	1.9E-02	2.9E-02	2.9E-02	3.5E-02	3.5E-02
Motor Thermal Time Constant	τ_{th}	minutes	21.6	21.6	25.0	25.0	28.3	28.3	33.3	33.3
Electrical Time Constant	τ_{elec}	millisecs	13.67	11.22	12.65	13.27	15.72	18.05	16.40	14.94
Mechanical Time Constant	τ_{mch}	millisecs	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3
Intermittent Torque Duration[10]	T_{2x}	seconds	65	65	78	78	116	116	127	127
Peak Torque Duration[11]	T_{3x}	seconds	24	24	27	27	37	37	38	38
Rotor Inertia	J	lb-in-sec^2	2.7E-04	2.7E-04	4.4E-04	4.4E-04	6.1E-04	6.1E-04	7.2E-04	7.2E-04
		kg-m^2	3.1E-05	3.1E-05	5.0E-05	5.0E-05	6.9E-05	6.9E-05	8.1E-05	8.1E-05
Number of Poles	Np		8	8	8	8	8	8	8	8
Motor Weight	#	lbs	4.8	4.8	7.1	7.1	9.4	9.4	11.7	11.7
		kg	2.2	2.2	3.2	3.2	4.3	4.3	5.3	5.3
Winding Class			H	H	H	H	H	H	H	H

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 12%.*
2 *Operation with 340 VDC bus. Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

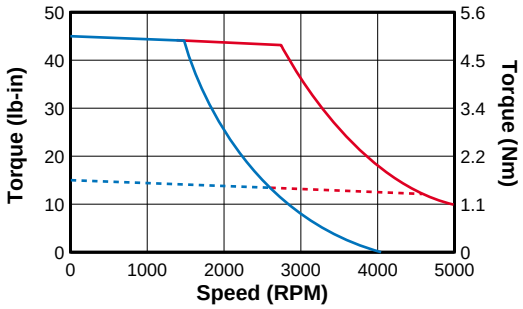
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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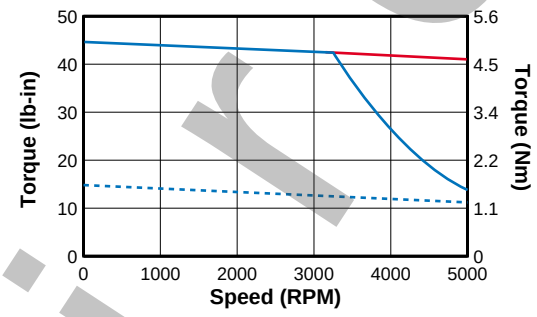
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Size 34, Encoder Feedback, Performance Curves

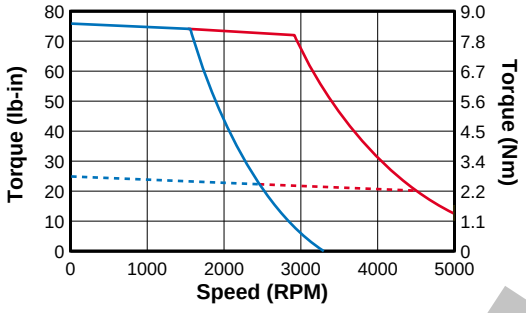
BE341FJ
Ics (sine)=5.1 amps, Ipk(sine)=15.4 amps



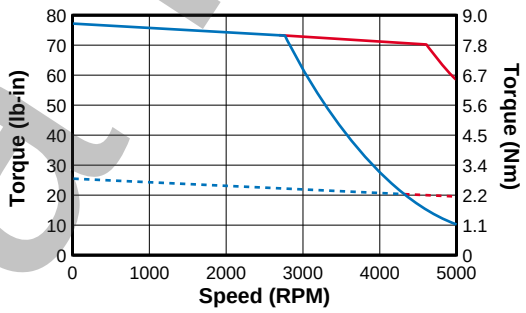
BE341JJ
Ics (sine)=10.4 amps, Ipk(sine)=31.3 amps



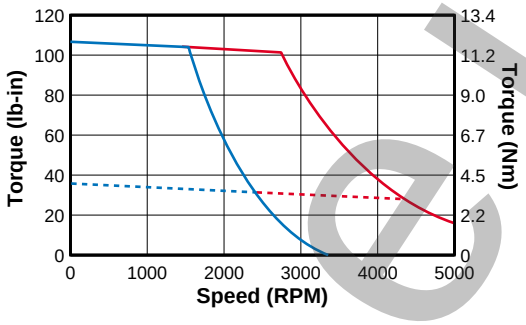
BE342HJ
Ics (sine)=6.9 amps, Ipk(sine)=20.6 amps



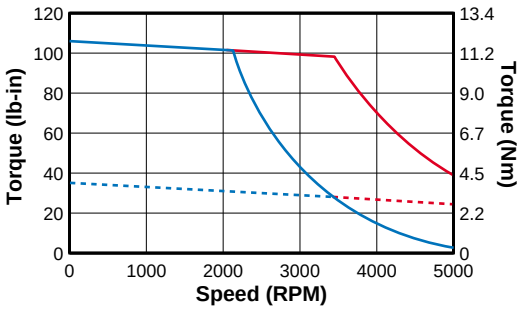
BE342KJ
Ics (sine)=13.5 amps, Ipk(sine)=40.4 amps



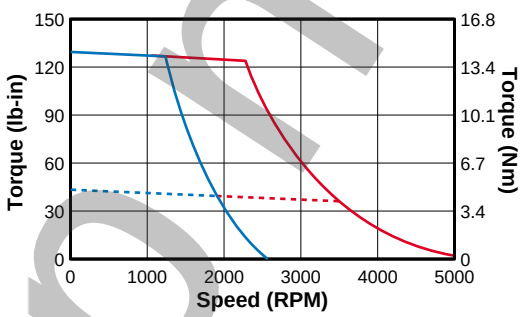
BE343JJ
Ics (sine)=9.9 amps, Ipk(sine)=29.8 amps



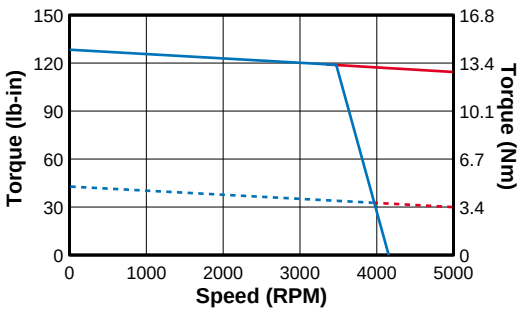
BE343LJ
Ics (sine)=15.8 amps, Ipk(sine)=47.4 amps



BE344JJ
Ics (sine)=9.1 amps, Ipk(sine)=27.2 amps



BE344L
Ics (sine)=14.3 amps, Ipk(sine)=43.0 amps





170 VDC 340 VDC

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Size 34, Resolver Feedback, Specifications

Parameter	Symbol	Units	BE341F	BE341J	BE342H	BE342K	BE343J	BE343L	BE344J	BE344L
Stall Torque Continous[1]	T_{cs}	lb-in	16.3	16.1	27.4	27.8	38.5	38.2	46.8	46.3
		oz-in	260	258	438	444	616	611	748	741
		Nm	1.82	1.81	3.07	3.11	4.31	4.28	5.24	5.19
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	5.6	11.3	7.4	14.6	10.7	17.1	9.8	15.5
Peak Torque[6]	T_{pk}	lb-in	48.8	48.4	82.2	83.3	115.6	114.6	140.3	139.0
		oz-in	781	775	1315	1333	1849	1833	2245	2223
		Nm	5.46	5.42	9.21	9.33	12.94	12.83	15.72	15.56
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	16.7	33.8	22.2	43.6	32.2	51.2	29.3	46.5
Rated Speed[2]	ω_r	rpm	4625	5000	4500	5000	4375	5000	3500	5000
Current @ Rated Speed	I_r(sine)	Amps Peak	4.8	9.5	6.3	11.9	9.0	13.4	8.5	11.8
Torque @ Rated Speed	T_r	lb-in	13.8	10.0	23.8	22.1	32.7	29.3	35.6	27.3
		oz-in	220	160	381	354	523	469	570	436
		Nm	1.54	1.12	2.67	2.48	3.66	3.28	3.99	3.05
Shaft Power @ Rated Speed	P_o	watts	753	592	1268	1309	1692	1734	1476	1612
Voltage Constant[3,4]	K_b	Volts/rad/s	0.382	0.187	0.483	0.249	0.468	0.292	0.624	0.390
Voltage Constant[3,4]	K_e	Volts/Krpm	40.00	19.58	50.58	26.08	49.01	30.58	65.35	40.84
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	46.84	22.93	59.23	30.53	57.39	35.81	76.52	47.83
		Nm/Amp Peak	0.328	0.161	0.415	0.214	0.402	0.251	0.536	0.335
Resistance[3]	R	Ohms	2.59	0.63	1.70	0.44	0.96	0.38	1.23	0.49
Inductance[5]	L	mH	35.40	7.07	21.50	5.84	15.09	6.86	20.17	7.30
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.40	1.40	1.20	1.20	1.01	1.01	0.95	0.95
Motor Constant	K_m	oz-in/√watt	33.61	33.36	52.45	53.15	67.64	67.07	79.67	78.89
		Nm/√watt	0.235	0.234	0.367	0.372	0.473	0.470	0.558	0.552
Viscous Damping	B	oz-in/Krpm	1.1	1.1	1.3	1.3	1.7	1.7	2.0	2.0
		Nm/Krpm	7.6E-03	7.6E-03	9.3E-03	9.3E-03	1.2E-02	1.2E-02	1.4E-02	1.4E-02
Static Friction	T_f	oz-in	1.7	1.7	2.7	2.7	4.2	4.2	5.0	5.0
		Nm	1.2E-02	1.2E-02	1.9E-02	1.9E-02	2.9E-02	2.9E-02	3.5E-02	3.5E-02
Motor Thermal Time Constant	τ_{th}	minutes	21.6	21.6	25.0	25.0	28.3	28.3	33.3	33.3
Electrical Time Constant	τ_{elec}	millisecs	13.67	11.22	12.65	13.27	15.72	18.05	16.40	14.94
Mechanical Time Constant	τ_{mch}	millisecs	0.6	0.6	0.4	0.4	0.3	0.3	0.3	0.3
Intermittent Torque Duration[10]	T_{2x}	seconds	65	65	78	78	116	116	127	127
Peak Torque Duration[11]	T_{3x}	seconds	24	24	27	27	37	37	38	38
Rotor Inertia	J	lb-in-sec^2	2.9E-04	2.9E-04	4.6E-04	4.6E-04	6.3E-04	6.3E-04	8.0E-04	8.0E-04
		kg-m^2	3.3E-05	3.3E-05	5.2E-05	5.2E-05	7.1E-05	7.1E-05	9.0E-05	9.0E-05
Number of Poles	Np		8	8	8	8	8	8	8	8
Motor Weight	#	lbs	4.8	4.8	7.1	7.1	9.4	9.4	11.7	11.7
		kg	2.2	2.2	3.2	3.2	4.3	4.3	5.3	5.3
Winding Class			H	H	H	H	H	H	H	H

1 *@ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40C ambient derate phase currents and torques by 12%.*
2 *Operation with 340 VDC bus. Maximum speed is 5000 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
8 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
9 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
10 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

Please

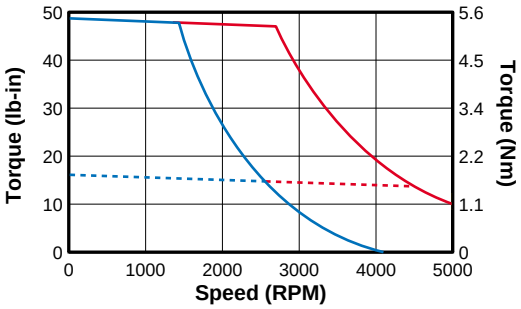
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Size 34, Resolver Feedback, Performance Curves

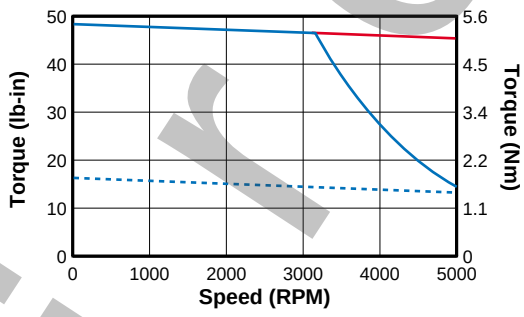
BE341FR

Ics (sine)=5.6 amps, Ipk(sine)=16.7 amps



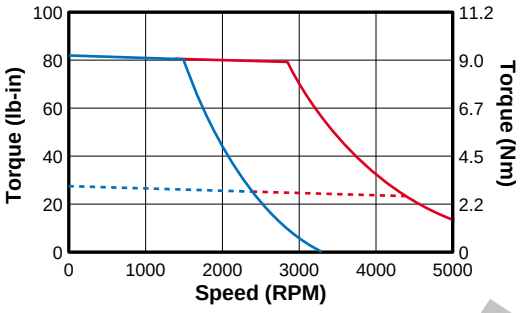
BE341JR

Ics (sine)=11.3 amps, Ipk(sine)=33.8 amps



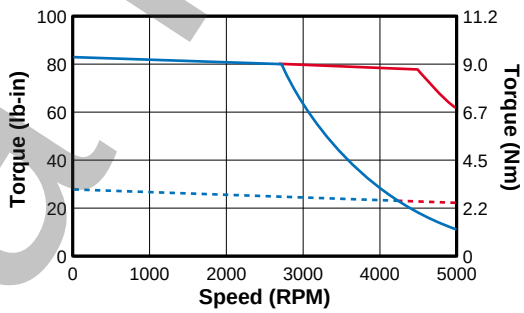
BE342HR

Ics (sine)=7.4 amps, Ipk(sine)=22.2 amps



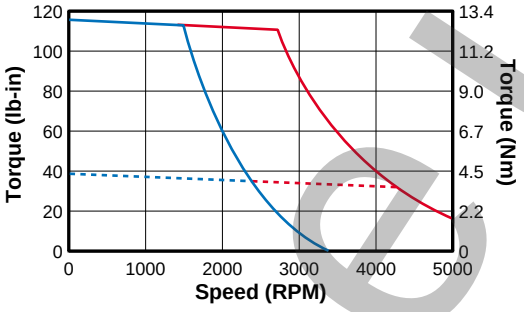
BE342KR

Ics (sine)=14.6 amps, Ipk(sine)=43.6 amps



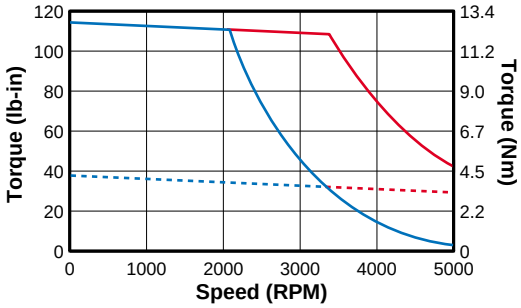
BE343JR

Ics (sine)=10.7 amps, Ipk(sine)=32.2 amps



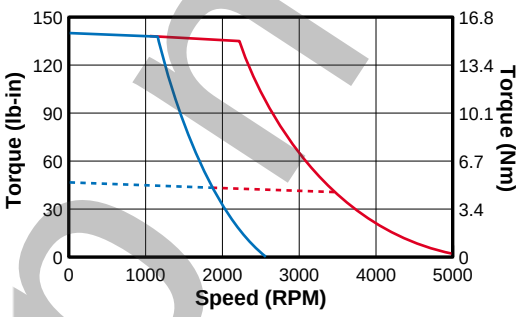
BE343LR

Ics (sine)=17.1 amps, Ipk(sine)=51.2 amps



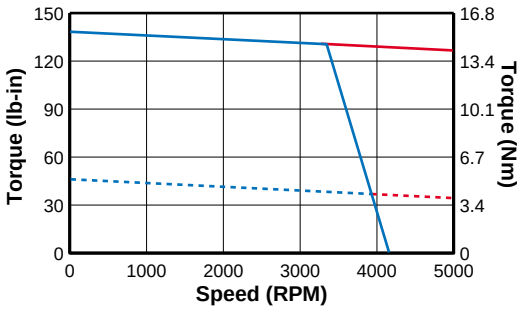
BE344JR

Ics (sine)=9.8 amps, Ipk(sine)=29.3 amps



BE344LR

Ics (sine)=15.5 amps, Ipk(sine)=46.5 amps





170 VDC 340 VDC

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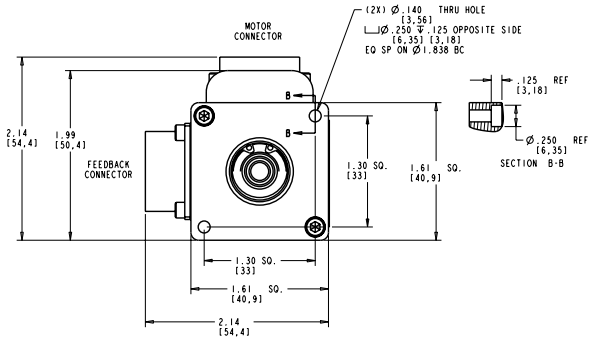
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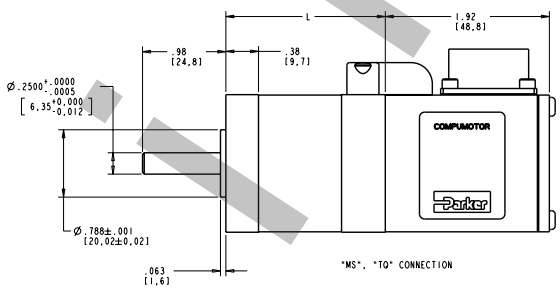
BE Series Dimensional Drawings

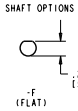
Size 16 Dimensional Drawing

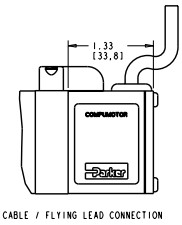
Dimensions in inches (mm)

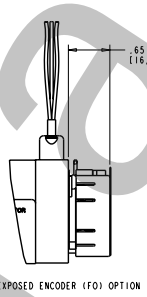
Motor Length			
Model	Standard	FO Option	Brake
BE161	3.29 (83.6)	2.02 (51.20)	2.70 (68.6)
BE162	3.79 (96.3)	2.52 (63.90)	3.20 (81.3)
BE163	4.29 (109.0)	3.02 (76.6)	3.70 (94.0)
BE164	4.79 (121.70)	3.52 (89.3)	4.20 (106.7)









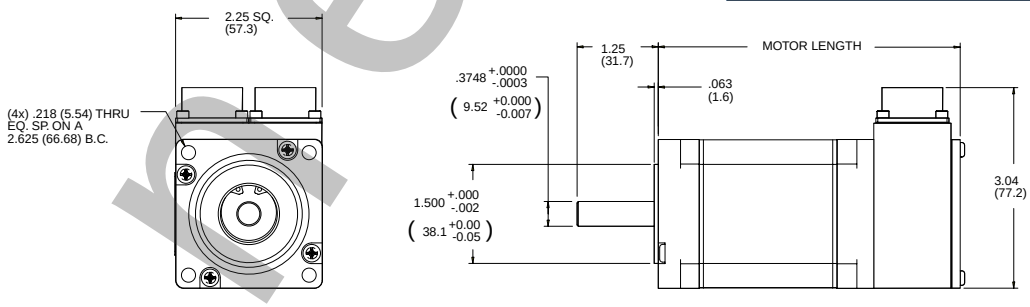


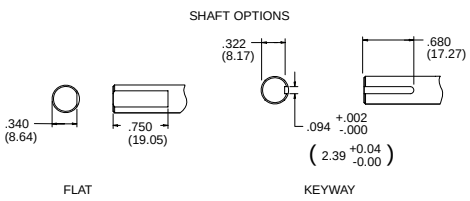
Motor Sizes	
Model	L
BE161	1.37 (34.8)
BE162	1.87 (47.5)
BE163	2.37 (60.2)
BE164	2.87 (72.9)

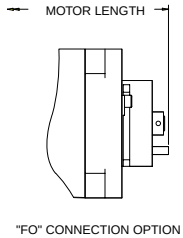
Size 23 Dimensional Drawing

Dimensions in inches (mm)

Motor Length			
Model	Standard	FO Option	Brake
BE230	3.15 (80)	2.50 (93)	4.51 (115)
BE231	3.65 (93)	3.00 (77)	5.01 (127)
BE232	4.65 (118)	4.00 (102)	6.01 (153)
BE233	5.65 (143)	5.00 (128)	7.01 (178)







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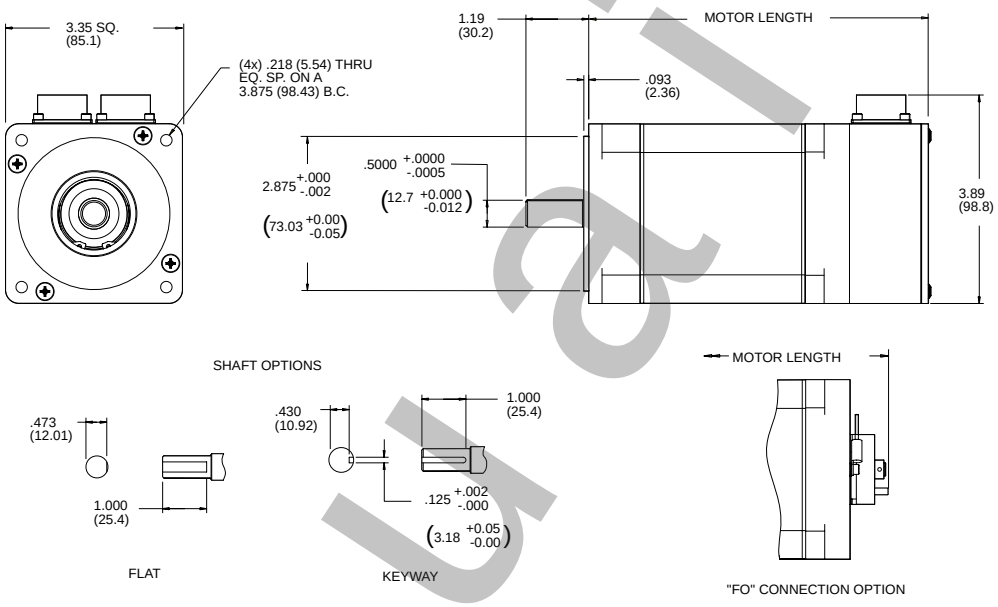
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BE Series Dimensional Drawings

Size 34 Dimensional Drawing

Dimensions in inches (mm)

Model	Motor Length Standard	FO Option	Brake
BE341	4.42 (112)	3.65 (93)	5.65 (144)
BE342	5.42 (138)	4.65 (118)	6.65 (169)
BE343	6.42 (163)	5.65 (144)	7.65 (194)
BE344	7.42 (188)	6.65 (169)	8.65 (220)



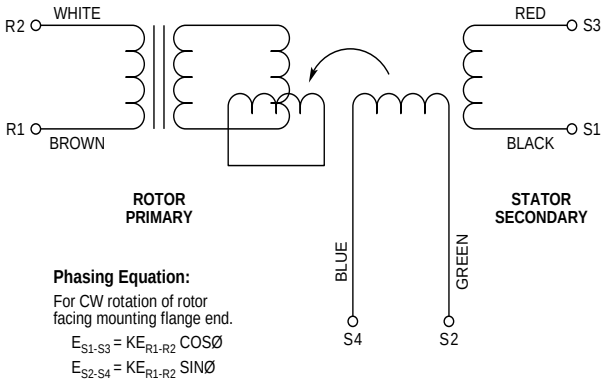
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BE Series, Feedback Specifications

Resolver Schematic Diagram



Phasing Equation:
For CW rotation of rotor facing mounting flange end.

$E_{S1-S3} = KE_{R1-R2} \cos\emptyset$

$E_{S2-S4} = KE_{R1-R2} \sin\emptyset$

Resolver Specifications

Parameter	Value
Input voltage @ 7 kHz	4.25 volts
Input current, max	55 mA
Input power, nominal	0.12 watts
Impedance ZSO (@ 90°)	58+j145 ohms
Impedance ZRO	53+j72 ohms
Impedance ZRS	42+j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
DC rotor resistance	23 ±10% ohms
DC stator resistance	19 ±10% ohms
Sensitivity	35 mV/degree
Max error from EZ	±10 minutes
Phase shift, open circuit	5° leading, ±3"
Null voltage, total	20 mV rms
Impedance ZSS	50+j128 ohms
Inertia	Incl. with motor spec.

Encoder Specifications

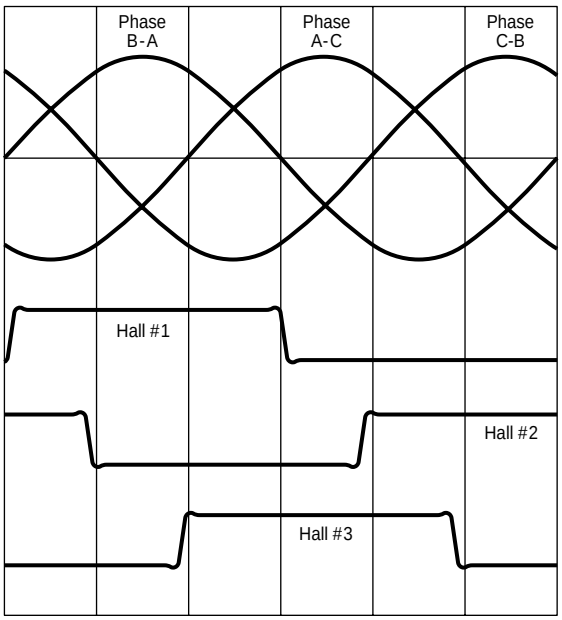
Mechanical		
	Accuracy	±2 min of arc
Electrical		
	Input power	5 VDC ±5%, 135 mA
	Operating frequency	250 kHz max
	Output device	26LS31
	Sink/Source, nominal	20 mA
	Suggested user interface	26LS32

Hall-Effect Specifications

Electrical		
	Input power	5 VDC ±5%, 80 mA
	Output device	LM339
	open collector	
	Maximum pull up	12 VDC
	Sink	16 mA

Commutation Chart

Clockwise rotation as viewed from front shaft.



Electrically Released Brakes

Brakes	Size 23	Size 34
Static rated torque	10 in-lb	40 in-lb
Coil voltage	24 VDC	24 VDC
Coil current	0.38 amps	0.7 amps
Weight	0.7 lbs	1.2 lbs
Inertia	1.87 E-05 lb-in-sec^2	1.14E-04 lb-in-sec^2
Engage/Disengage	10/20 msec	20/40 msec

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Wiring and Cable Specifications

Flying Leads, Cabled and "MS" Connection Options

The **"FO" connection** option for the BE Series motors features 18" leads extending from the motor body. This option features a plastic encoder cover and no connector housing. Wire color codes are the same as listed below for "MS" wired BE Series motors. The "FO" option is only available on motors with encoder feedback.

The **"FL" connection** option for the BE Series motors features 18" leads extending from the motor body. This option features an extruded aluminum housing. Wire color codes are the same as listed below for "MS" wired BE Series motors. The "FL" option is only available on motors with encoder feedback.

The **"10" connection** option for the BE Series motors consists of 10 feet of hard-wired cable extending from the motor body. These cables terminate in flying leads. Wire color codes are the same as listed below for the "MS" connection option. The "10" option is only available on motors with encoder feedback.

The **"MS" connection** option for the BE Series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. With the "MS" connection option, the motor phase wires are in one connector, and the hall, encoder, temperature switch, and brake wires are in the other connector. This option works well when using an amplifier with a built-in controller, or when all cables enter into a cabinet or enclosure and then are wired into a terminal strip. When specifying the "R" (resolver) feedback option, the motor phase wires reside in one connector, the resolver signal, temperature switch, and brake wires in the other.

Motor Connection

Designation	Pin Number MS14-12[1]	Wire Color "MS"/"RS" Cables	Wire Color "GS/GB" Cables
Phase A	J	Red/Yellow	Black 1
Phase B	K	White/Yelow	Black 2
Phase C	L	Black/Yellow	Black 3
Ground	M	Green/Yellow	Green/Yellow
Shield	N.C.	Clear	N.C.

Encoder/Hall Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Hall Ground	K	White/Green
Hall +5	M	White/Blue
Hall 1	T	White/Brown
Hall 2	U	White/Orange
Hall 3	P	White/Violet
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue
Temp	L	Orange/Yellow
Temp	N	Orange/Yellow
Shield	N.C.	Clear

1 Brake will operate regardless of polarity of connection

Resolver Feedback Connection

Designation	Pin Number MS14-18	Wire Color
S1, COS +	E	Black
S2, SIN +	L	Green
S3, COS -	J	Red
S4, SIN -	G	Blue
R1, EXC +	C	Brown
R2, EXC -	U	White
Temp	R	Orange/Yellow or Yellow
Temp	N	Orange/Yellow or Yellow
Brake[2]	S	Red/Blue
Brake[2]	T	Red/Blue
Shield	N.C.	Clear

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Wiring and Cable Specifications (continued)

"TQ" Connection Option

The **"TQ" Connection** option for the BE series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. The "TQ" connection option joins the motor phase wires, temperature switch, and hall effect signals in one connector. The second connector has only encoder signals. This connection option applies well in applications where the hall and motor phase wires connect directly to an amplifier, while the encoder signals connect directly to a controller.

Motor/Hall Connection

Designation	Pin Number MS14-12	Wire Color
Phase A	J	Red/Yellow
Phase B	K	White/Yellow
Phase C	L	Black/Yellow
Ground	M	Green/Yellow
Temp	G	Orange/Yellow or Yellow
Temp	H	Orange/Yellow or Yellow
Shield	N.C.	Clear
Hall Ground	F	White/Green
Hall +5	B	White/Blue
Hall 1	C	White/Brown
Hall 2	D	White/Orange
Hall 3	E	White/Violet

Encoder Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue

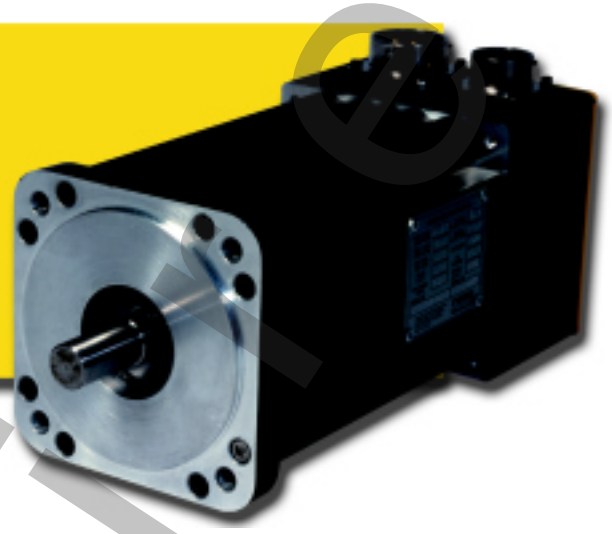
[1] *Brake will operate regardless of polarity of connection*

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NeoMetric & J Series Motors



Innovative Bridged Stator Design

The NeoMetric and J Series brushless servo motors feature a bridged stator design. This state-of-the-art motor design establishes industry-leading torque to inertia ratios in a very compact package size.

The bridged stator construction also reduces audible noise generated by the motor. Conventional motor designs allow magnetic forces to act upon the stator teeth, creating movement in them much like a cantilever beam. The "bridges" between the teeth in the NeoMetric design effectively stiffen the teeth, reducing movement.

This same design principle also allows advanced manufacturing techniques. The two-piece stator lamination of the bridged stator design allows the slot opening, traditionally on the inside diameter, to be transferred to the outside diameter, simplifying winding insertion.

The NeoMetric Series brushless servo motors provide extremely high torque to inertia ratios. For applications involving a high inertial load, a larger rotor inertia may be desirable. The J Series motors were designed specifically for these types of applications. The J Series motors provide the same performance as the NeoMetric Series, but feature a higher rotor inertia.

The size 34 NeoMetric Series and J Series servo motors are available with integrated planetary gearheads in ratios up to 100:1. Our unique package integrates the gearhead pinion into the motor shaft, reducing the overall package length by up to 2 inches.

Features

- 70mm, 92mm, and size 34
- 6 to 61 lb-in continuous torque
- Brushless construction
- High torque density packaging
- Outstanding torque-to-inertia ratios
- Bridged stator design - quiet operation
- High performance neodymium magnets
- Thermoswitch protection
- TENV housing, IP65 option
- Resolver, encoder, Hall feedback options
- 10-day deliveries
- Two year warranty
- CAD (.dxf) drawings available
- CE Compliant

Part Numbering System

N	0923	H	R-	N	MS	B
Series	*Frame, Magnet Length*	*Winding*	*Feedback*	*Shafting*	*Connections*	*Options*
N: NeoMetric Series J: Medium Inertia Series[4]	0701 0341 0921 0702 0342 0922 0703 0343 0923 0704 0344 0924	Identifying character D, E, F, etc.	D - 500 ppr encoder[2] E - 1000 ppr encoder H - Hall-effect only R - Resolver	N - Normal F - Flat K - Keyway	FL - Flying leads[2] 10 - 10' cable[2] PT - Pipe Thread Taps[1] TQ - Trap drive MS - Military style	N - None B - Brake V - Shaft seal[5] GXX - Gearhead[3]

1 92 mm motors only
2 70mm and 34 frame only
3 34 & 92 frame motors only. Specify "K" shaft option with gearheads
4 Four stack motor lengths not available with J Series
5 With MS or TQ connectors, IP65.

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70 mm or Size 34, Encoder Feedback, Specifications*

Parameter	Symbol	Units	N0701D N0341D	N0701F N0341F	N0702E N0342E	N0702F N0342F	N0703F N0343F	N0703G N0343G	N0704F N0344F	N0704G N0344G
Stall Torque Continous[1]	T_{cs}	lb-in	5.7	5.6	10.4	10.4	15.8	15.8	19.5	19.5
		oz-in	91	90	167	166	252	252	311	312
		Nm	0.63	0.63	1.17	1.16	1.77	1.77	2.18	2.19
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	3.3	5.2	3.8	5.4	5.2	7.3	5.4	7.5
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	2.9	4.5	3.3	4.6	4.5	6.3	4.7	6.5
Peak Torque[6]	T_{pk}	lb-in	17.0	16.8	31.2	31.1	47.3	47.3	58.4	58.6
		oz-in	272	269	500	498	757	757	934	937
		Nm	1.90	1.88	3.50	3.49	5.30	5.30	6.54	6.56
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	10.0	15.6	11.5	16.1	15.7	21.9	16.3	22.6
Peak Current[6,7]	I_{pk}(trap)	Amps DC	8.7	13.5	10.0	13.9	13.6	19.0	14.1	19.6
Rated Speed[2]	ω_r	rpm	7500	7500	7500	7500	6800	7500	5500	7500
Current @ Rated Speed	I_r(sine)	Amps	3.0	4.7	3.2	4.5	4.4	5.8	4.6	5.6
Current @ Rated Speed	I_r(trap)	Amps	2.6	4.1	2.8	3.9	3.8	5.0	4.0	4.9
Torque @ Rated Speed	T_r	lb-in	4.7	4.6	7.1	7.9	10.8	11.4	14.1	12.6
		oz-in	75	74	114	126	173	182	226	201
		Nm	0.53	0.52	0.80	0.88	1.21	1.27	1.58	1.41
Shaft Power @ Rated Speed	P_o	watts	416	411	632	699	870	1010	919	1115
Voltage Constant[3,4]	K_b	Volts/rad/s	0.221	0.140	0.353	0.253	0.392	0.282	0.468	0.338
Voltage Constant[3,4]	K_e	Volts/KRPM	23.14	14.66	36.97	26.49	41.05	29.53	49.01	35.40
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	27.10	17.17	43.29	31.03	48.07	34.58	57.39	41.45
		Nm/Amp Peak	0.190	0.120	0.303	0.217	0.336	0.242	0.402	0.290
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	31.29	19.82	49.98	35.82	55.51	39.93	66.27	47.86
		Nm/Amp DC	0.219	0.139	0.350	0.251	0.389	0.280	0.464	0.335
Resistance[3]	R	Ohms	5.52	2.27	5.22	2.70	3.36	1.74	3.47	1.80
Inductance[5]	L	mH	12.98	5.23	15.80	8.16	12.13	6.30	14.50	7.55
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.44	1.44	1.15	1.15	0.96	0.96	0.87	0.87
Motor Constant	K_m	oz-in/$\sqrt{}$watt	13.32	13.16	21.88	21.80	30.28	30.27	35.57	35.67
		Nm/$\sqrt{}$watt	0.093	0.092	0.153	0.153	0.212	0.212	0.249	0.250
Viscous Damping	B	oz-in/Krpm	0.2	0.2	0.4	0.4	0.6	0.6	0.8	0.8
		Nm/krpm	1.4 E-3	1.4 E-3	2.8 E-3	2.8 E-3	4.2 E-3	4.2 E-3	5.6 E-3	5.6 E-3
Static Friction	T_f	oz-in	0.8	0.8	1.6	1.6	2.4	2.4	3.2	3.2
		Nm	5.6 E-3	5.6 E-3	1.2 E-2	1.2 E-2	1.7 E-2	1.7 E-2	2.2 E-2	2.2 E-2
Motor Thermal Time Constant	τ_{th}	minutes	16.6	16.6	21.7	21.7	22.5	22.5	23.3	23.3
Electrical Time Constant	τ_{elec}	millisecs	2.35	2.30	3.03	3.02	3.61	3.62	4.18	4.19
NeoMetric Mech. Time Const.	τ_{mch}	millisecs	1.6	1.7	0.6	0.6	0.6	0.6	0.6	0.6
J Series Mech. Time Const.	τ_{mch}	millisecs	14.7	14.7	5.7	5.7	3.2	3.2	N/A	N/A
Intermittent Torque Duration[10]	T_{2x}	seconds	22	22	32	32	39	39	38	38
Peak Torque Duration[11]	T_{3x}	seconds	9	9	11	11	13	13	12	12
NeoMetric Rotor Inertia	J	lb-in-sec^2	1.1 E-4	1.1 E-4	1.7 E-4	1.7 E-4	2.4 E-4	2.4 E-4	3.1 E-4	3.1 E-4
		kg-m^2	1.2 E-5	1.2 E-5	2.0 E-5	2.0 E-5	2.7 E-5	2.7 E-5	3.5 E-5	3.5 E-5
J Series Rotor Inertia	J	lb-in-sec^2	1.1 E-3	1.1 E-3	1.2 E-3	1.2 E-3	1.3 E-3	1.3 E-3	N/A	N/A
		kg-m^2	1.3 E-4	1.3 E-4	1.4 E-4	1.4 E-4	1.5 E-4	1.5 E-4	N/A	N/A
Number of Poles	Np		4	4	4	4	4	4	4	4
NeoMetric Weight	#	lbs	3.5	3.5	4.5	4.5	6.0	6.0	7.3	7.3
		kg	1.6	1.6	2.1	2.1	2.7	2.7	3.3	3.3
J Series Weight	#	lbs	4.4	4.4	5.4	5.4	6.9	6.9	N/A	N/A
		kg	2.0	2.0	2.5	2.5	3.1	3.1	N/A	N/A
Winding Class			H	H	H	H	H	H	H	H

* NeoMetric and J Series Specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 12%.*

2 *Maximum speed is 7500 RPM. For higher speed operation please call the factory.*

3 *Measured Line to Line, +/- 10%.*

4 *Value is measured peak of sine wave.*

5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*

6 *Initial winding temperature must be 60°C or less before peak current is Applied.*

7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*

8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*

9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*

10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*

11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

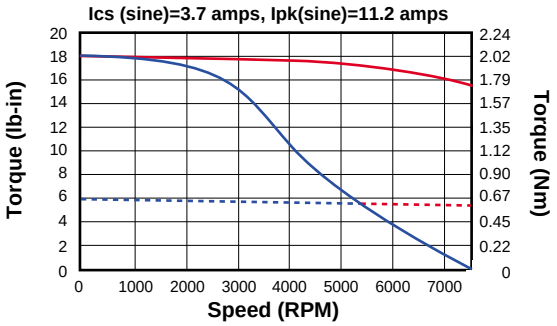
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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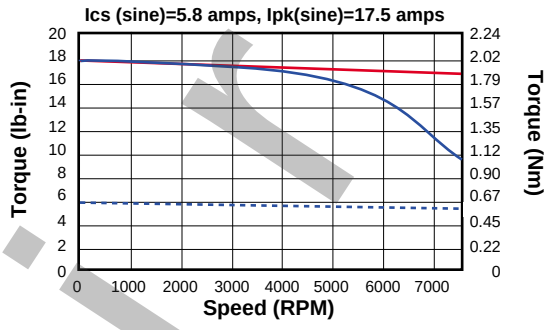
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70 mm or Size 34, Encoder Feedback, Performance Curves (Neometric & J Series data are identical unless otherwise noted)

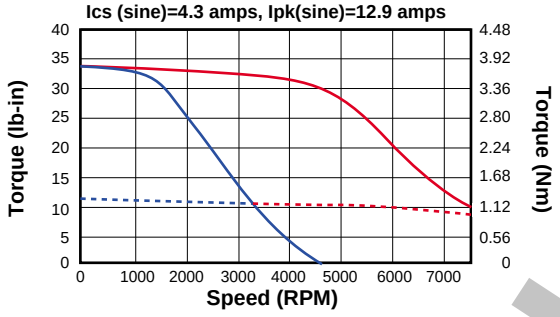
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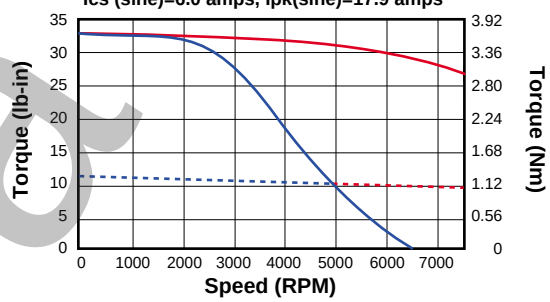
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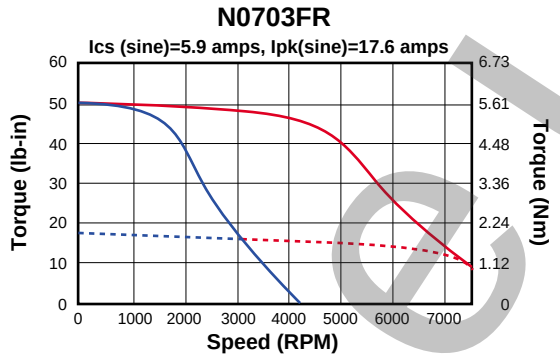
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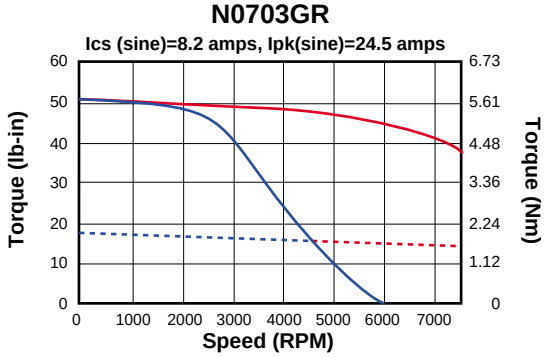
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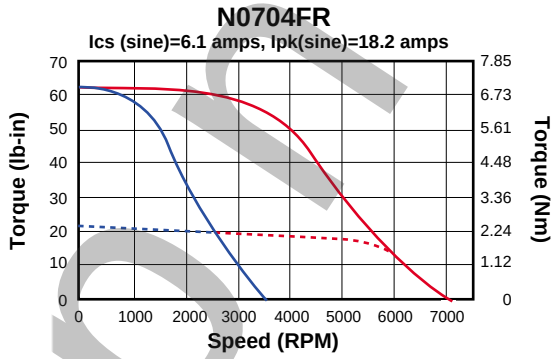
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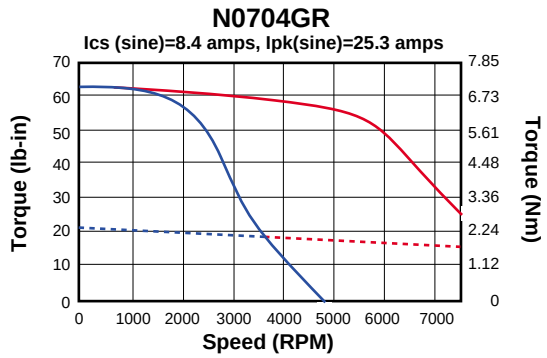
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170 VDC 340 VDC

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70 mm or Size 34, Resolver Feedback, Specifications*

Parameter	Symbol	Units	N0701D N0341D	N0701F N0341F	N0702E N0342E	N0702F N0342F	N0703F N0343F	N0703G N0343G	N0704F N0344F	N0704G N0344G
Stall Torque Continous[1]	T_{cs}	lb-in	6.3	6.3	11.6	11.6	17.6	17.6	21.8	21.8
		oz-in	101	100	186	186	282	282	348	349
		Nm	0.71	0.70	1.30	1.30	1.97	1.97	2.44	2.44
Stall Current Continuous[1,4,7]	I_{cs}(sine)	Amps Peak	3.7	5.8	4.3	6.0	5.9	8.2	6.1	8.4
Peak Torque[6]	T_{pk}	lb-in	19.0	18.8	34.9	34.8	52.9	52.9	65.3	65.4
		oz-in	304	300	559	557	846	846	1045	1047
		Nm	2.13	2.10	3.91	3.90	5.92	5.92	7.32	7.33
Peak Current[4,6,7]	I_{pk}(sine)	Amps Peak	11.2	17.5	12.9	17.9	17.6	24.5	18.2	25.3
Rated Speed[2]	ω_r	rpm	7500	7500	7100	7500	6600	7500	5500	7500
Current @ Rated Speed	I_r(sine)	Amps	3.5	5.4	3.8	5.2	5.1	6.9	5.4	6.8
Torque @ Rated Speed	T_r	lb-in	5.4	5.3	8.6	9.3	12.8	13.6	16.1	15.0
		oz-in	86	85	138	149	205	217	257	240
		Nm	0.60	0.60	0.97	1.04	1.44	1.52	1.80	1.68
Shaft Power @ Rated Speed	P_o	watts	477	472	725	827	1001	1204	1045	1331
Voltage Constant[3,4]	K_b	Volts/rad/s	0.221	0.140	0.353	0.253	0.392	0.282	0.468	0.338
Voltage Constant[3,4]	K_e	Volts/KRPM	23.14	14.66	36.97	26.49	41.05	29.53	49.01	35.40
Torque Constant[8]	K_t(sine)	oz-in/Amp Peak	27.10	17.17	43.29	31.03	48.07	34.58	57.39	41.45
		Nm/Amp Peak	0.190	0.120	0.303	0.217	0.336	0.242	0.402	0.290
Resistance[3]	R	Ohms	5.52	2.27	5.22	2.70	3.36	1.74	3.47	1.80
Inductance[5]	L	mH	12.98	5.23	15.80	8.16	12.13	6.30	14.50	7.55
Maximum Bus Voltage	Vm	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.44	1.44	1.15	1.15	0.96	0.96	0.87	0.87
Motor Constant	K_m	oz-in/√watt	13.32	13.16	21.88	21.80	30.28	30.27	35.57	35.67
		Nm/√watt	0.093	0.092	0.153	0.153	0.212	0.212	0.249	0.250
Viscous Damping	B	oz-in/Krpm	0.2	0.2	0.4	0.4	0.6	0.6	0.8	0.8
		Nm/krpm	1.4 E-3	1.4 E-3	2.8 E-3	2.8 E-3	4.2 E-3	4.2 E-3	5.6 E-3	5.6 E-3
Static Friction	T_f	oz-in	0.8	0.8	1.6	1.6	2.4	2.4	3.2	3.2
		Nm	5.6 E-3	5.6 E-3	1.2 E-2	1.2 E-2	1.7 E-2	1.7 E-2	2.2 E-2	2.2 E-2
Motor Thermal Time Constant	τ_{th}	minutes	16.6	16.6	21.7	21.7	22.5	22.5	23.3	23.3
Electrical Time Constant	τ_{elec}	millisecs	2.35	2.30	3.03	3.02	3.61	3.62	4.18	4.19
NeoMetric Mech. Time Constant	τ_{mch}	millisecs	1.6	1.7	0.9	0.9	0.6	0.6	0.6	0.6
J Series Mech. Time Constant	τ_{mch}	millisecs	14.7	14.7	5.7	5.7	3.2	3.2	N/A	N/A
Intermittent Torque Duration[9]	T_{2x}	seconds	22	22	32	32	39	39	38	38
Peak Torque Duration[10]	T_{3x}	seconds	9	9	11	11	13	13	12	12
NeoMetric Rotor Inertia	J	lb-in-sec^2	1.3 E-4	1.3 E-4	2.0 E-4	2.0 E-4	2.6 E-4	2.6 E-4	3.3 E-4	3.3 E-4
		kg-m^2	1.5 E-5	1.5 E-5	2.2 E-5	2.2 E-5	3.0 E-5	3.0 E-5	3.7 E-5	3.7 E-5
J Series Rotor Inertia	J	lb-in-sec^2	1.1 E-3	1.1 E-3	1.2 E-3	1.2 E-3	1.3 E-3	1.3 E-3	N/A	N/A
		kg-m^2	1.3 E-4	1.3 E-4	1.4 E-4	1.4 E-4	1.5 E-4	1.5 E-4	N/A	N/A
Number of Poles	Np	#	4	4	4	4	4	4	4	4
NeoMetric Weight	#	lbs	3.5	3.5	4.5	4.5	6.0	6.0	7.3	7.3
		kg	1.6	1.6	2.1	2.1	2.7	2.7	3.3	3.3
J Series Weight	#	lbs	4.4	4.4	5.4	5.4	6.9	6.9	N/A	N/A
		kg	2.0	2.0	2.5	2.5	3.1	3.1	N/A	N/A
Winding Class			H	H	H	H	H	H	H	H

* NeoMetric and J Series Specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate." @40°C ambient derate phase currents and torques by 12%.*
2 *Maximum speed is 7500 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is Applied.*
7 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
8 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
9 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
10 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

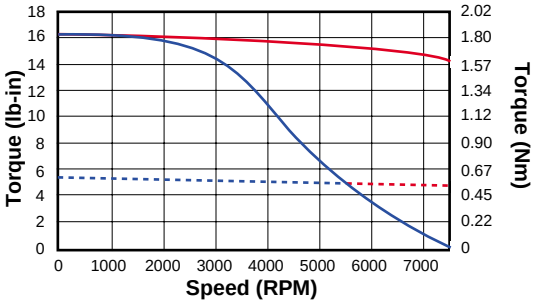
Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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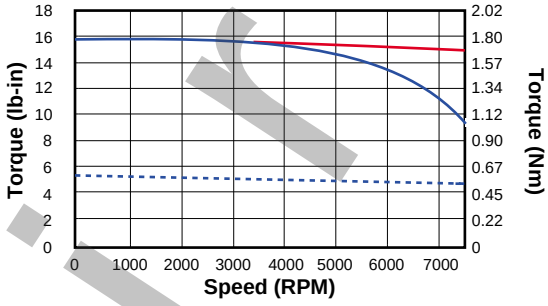
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70mm or Size 34, Resolver Feedback, Performance Curves (Neometric & J Series data are identical unless otherwise noted)

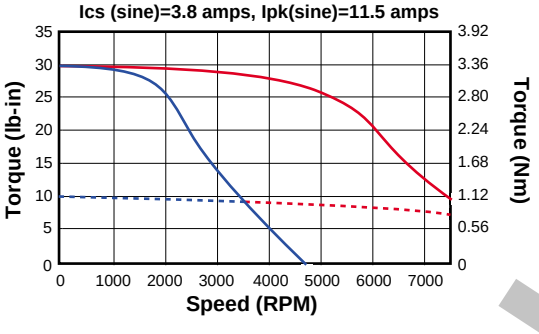
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Ics (sine)=3.3 amps, Ipk(sine)=10.0 amps



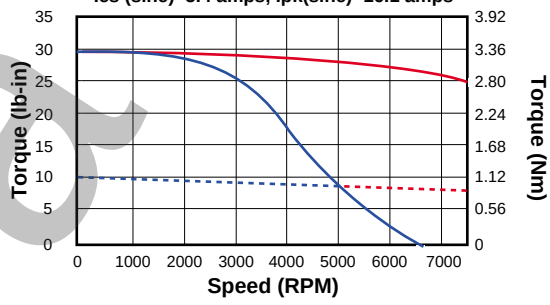
N0701FE
Ics (sine)=5.2 amps, Ipk(sine)=15.6 amps



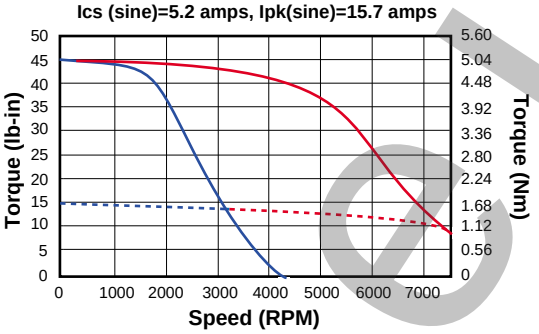
N0702EE
Ics (sine)=3.8 amps, Ipk(sine)=11.5 amps



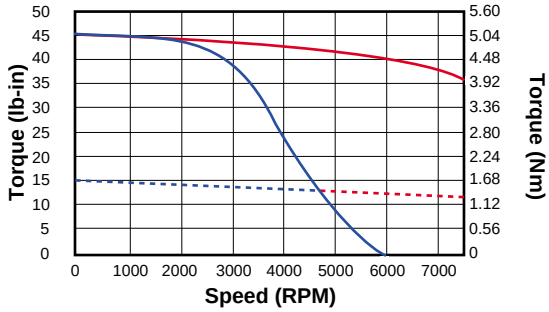
N0702FE
Ics (sine)=5.4 amps, Ipk(sine)=16.1 amps



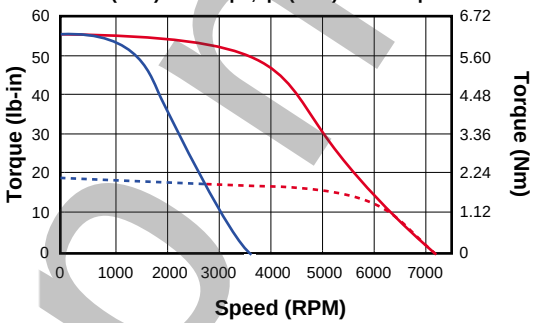
N0703FE
Ics (sine)=5.2 amps, Ipk(sine)=15.7 amps



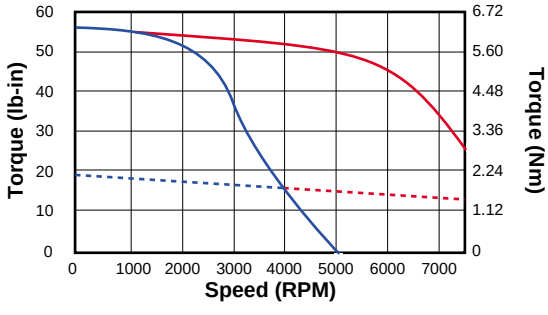
N0703GE
Ics (sine)=7.3 amps, Ipk(sine)=21.9 amps



N0704FE
Ics (sine)=5.4 amps, Ipk(sine)=16.3 amps



N0704GE
Ics (sine)=7.5 amps, Ipk(sine)=22.6 amps



CONTINUOUS PEAK — 170 VDC
CONTINUOUS PEAK — 340 VDC

preuaire

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92 mm, Encoder Feedback, Specifications*

Parameter	Symbol	Units	N0921F	N0921G	N0922G	N0922J	N0923H	N0923K	N0924J	N0924K
Stall Torque Continous[1]	T_{cs}	lb-in	15.5	15.6	27.6	28.3	41.3	40.6	54.6	54.8
		oz-in	249	249	442	453	660	650	873	876
		Nm	1.74	1.74	3.09	3.17	4.62	4.55	6.11	6.14
Stall Current Continuous[1,4,8]	I_{cs}(sine)	Amps Peak	4.7	6.6	6.5	10.1	10.0	17.4	10.8	15.2
Stall Current Continuous[1,7]	I_{cs}(trap)	Amps DC	4.1	5.7	5.6	8.7	8.6	15.1	9.4	13.2
Peak Torque[6]	T_{pk}	lb-in	46.6	46.7	82.9	83.5	123.7	121.9	163.8	164.3
		oz-in	746	747	1327	1336	1979	1951	2620	2629
		Nm	5.22	5.23	9.29	9.35	13.85	13.66	18.34	18.41
Peak Current[4,6,8]	I_{pk}(sine)	Amps Peak	14.2	19.7	19.5	30.3	29.9	52.2	32.5	45.6
Peak Current[6,7]	I_{pk}(trap)	Amps DC	12.3	17.1	26.9	26.2	25.9	45.2	28.2	39.5
Rated Speed[2]	ω_r	rpm	6000	7500	4650	7300	4700	7500	3750	5250
Current @ Rated Speed	I_r(sine)	Amps	4.1	5.2	5.6	7.0	8.6	11.9	9.7	12.4
Current @ Rated Speed	I_r(trap)	Amps	3.5	4.5	4.8	6.0	7.4	10.3	8.4	10.7
Torque @ Rated Speed	T_r	lb-in	11.8	11.3	20.4	16.3	30.4	28.8	41.0	39.1
		oz-in	188	181	326	260	487	461	656	626
		Nm	1.32	1.27	2.28	1.82	3.41	3.23	4.59	4.38
Shaft Power @ Rated Speed	P_o	watts	834	1004	1121	1404	1689	2557	1820	2431
Voltage Constant[3,4]	K_b	Volts/rad/s	0.427	0.309	0.556	0.360	0.540	0.305	0.657	0.470
Voltage Constant[3,4]	K_e	Volts/KRPM	44.72	32.36	58.22	37.70	56.55	31.94	68.80	49.22
Torque Constant[9]	K_t(sine)	oz-in/Amp Peak	52.36	37.89	68.18	44.15	66.22	37.40	80.57	57.64
		Nm/Amp Peak	0.367	0.265	0.477	0.309	0.464	0.262	0.564	0.403
Torque Constant[3,4]	K_t(trap)	oz-in/Amp DC	60.46	43.75	78.73	50.98	76.46	43.19	93.03	66.55
		Nm/Amp DC	0.423	0.306	0.551	0.357	0.535	0.302	0.651	0.466
Resistance[3]	R	Ohms	3.72	1.94	2.32	0.96	1.28	0.42	1.22	0.62
Inductance[5]	L	mH	17.11	8.99	14.72	6.18	14.95	4.78	20.60	10.51
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.06	1.06	0.91	0.91	0.7	0.7	0.62	0.62
Motor Constant	K_m	oz-in/$\sqrt{}$watt	31.35	31.41	51.69	52.03	67.59	66.64	84.23	84.52
		Nm/$\sqrt{}$watt	0.219	0.220	0.362	0.364	0.473	0.466	0.590	0.592
Viscous Damping	B	oz-in/Krpm	0.5	0.5	0.8	0.8	1.1	1.1	1.4	1.4
		Nm/krpm	3.5 E-3	3.5 E-3	5.6 E-3	5.6 E-3	7.7 E-3	7.7 E-3	9.8 E-3	9.8 E-3
Static Friction	T_f	oz-in	2.5	2.5	4.8	4.8	5.4	5.4	6.6	6.6
		Nm	1.8 E-2	1.8 E-2	3.4 E-2	3.4 E-2	3.8 E-2	3.8 E-2	4.6 E-2	4.6 E-2
Motor Thermal Time Constant	τ_{th}	minutes	21.6	21.6	30	30	35	35	37	37
Electrical Time Constant	τ_{elec}	millisecs	4.60	4.63	6.34	6.44	11.68	11.38	16.89	16.95
NeoMetric Mech. Time Constant	τ_{mch}	millisecs	0.8	0.8	0.5	0.5	0.4	0.5	0.4	0.4
J Series Mech. Time Constant	τ_{mch}	millisecs	10.0	10.0	3.9	3.9	2.4	2.4	N/A	N/A
Intermittent Torque Duration[10]	T_{2x}	seconds	48	48	39	39	61	61	61	61
Peak Torque Duration[11]	T_{3x}	seconds	17	17	13	13	16	16	15	15
NeoMetric Rotor Inertia	J	lb-in-sec^2	3.6 E-4	3.6 E-4	6.2 E-4	6.2 E-4	8.8 E-4	8.8 E-4	1.1 E-3	1.1 E-3
		kg-m^2	4.1 E-5	4.1 E-5	7.0 E-5	7.0 E-5	1.0 E-4	1.0 E-4	1.3 E-4	1.3 E-4
J Series Rotor Inertia	J	lb-in-sec^2	4.2 E-3	4.2 E-3	4.5 E-3	4.5 E-3	4.8 E-3	4.8 E-3	N/A	N/A
		kg-m^2	4.8 E-4	4.8 E-4	5.1 E-4	5.1 E-4	5.4 E-4	5.4 E-4	N/A	N/A
Number of Poles	Np		4	4	4	4	4	4	4	4
NeoMetric Weight	#	lbs	8.1	8.1	11.7	11.7	15.1	15.1	18.0	18.0
		kg	3.7	3.7	5.3	5.3	6.9	6.9	8.2	8.2
J Series Weight	#	lbs	9.9	9.9	13.5	13.5	16.9	16.9	N/A	N/A
		kg	4.5	4.5	6.1	6.1	7.7	7.7	N/A	N/A
Winding Class			H	H	H	H	H	H	H	H

* NeoMetric and J Series Specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 125°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40°C ambient derate phase currents and torques by 12%.*
2 *Maximum speed is 7500 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is Applied.*
7 *DC current through a pair of motor phases of a trapazoidally (six state) commutated motor.*
8 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
9 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
10 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
11 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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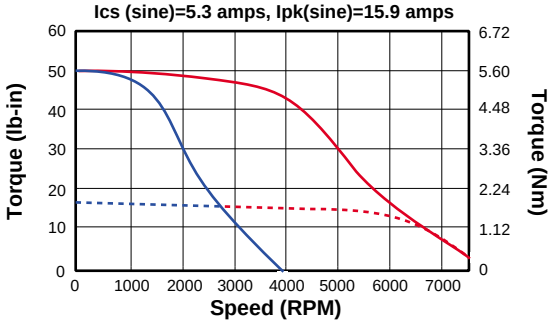
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92 mm, Encoder Feedback, Performance Curves

(Neometric & J Series data are identical unless otherwise noted)

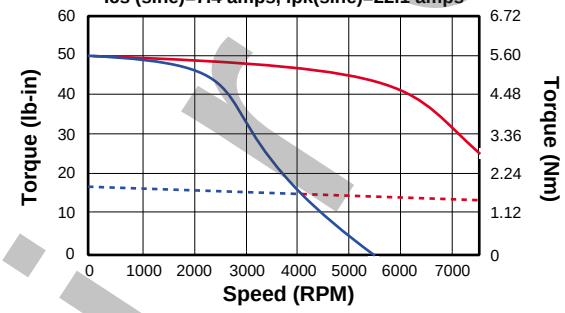
N0921FR

Ics (sine)=5.3 amps, Ipk(sine)=15.9 amps



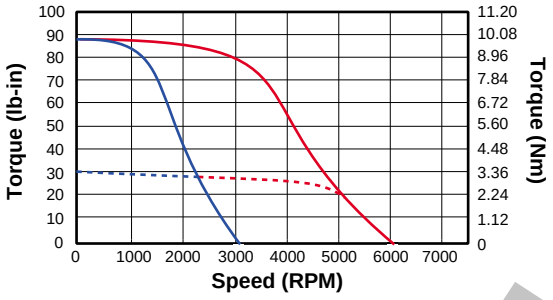
N0921GR

Ics (sine)=7.4 amps, Ipk(sine)=22.1 amps



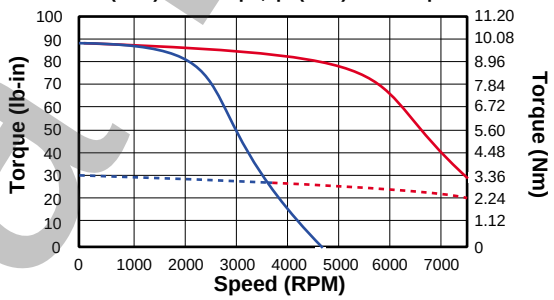
N0922GR

Ics (sine)=7.3 amps, Ipk(sine)=21.8 amps



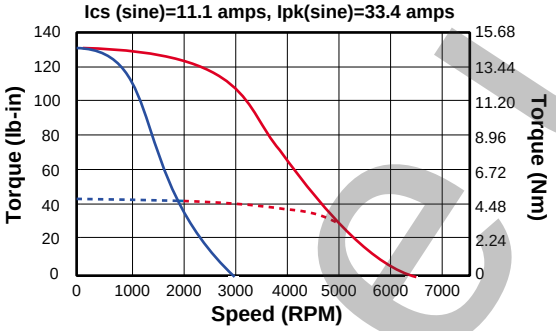
N0922JR

Ics (sine)=11.3 amps, Ipk(sine)=33.8 amps



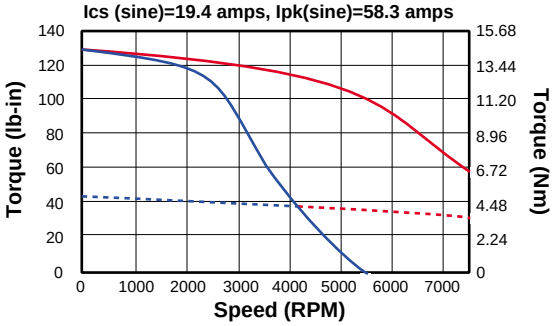
N0923HR

Ics (sine)=11.1 amps, Ipk(sine)=33.4 amps



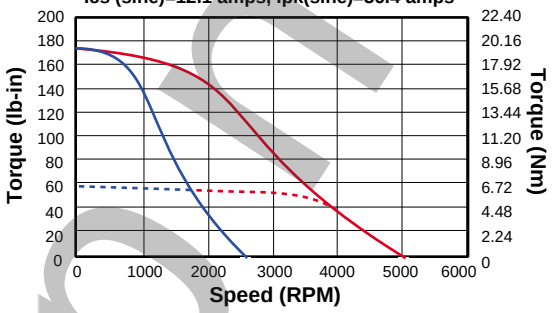
N0923KR

Ics (sine)=19.4 amps, Ipk(sine)=58.3 amps



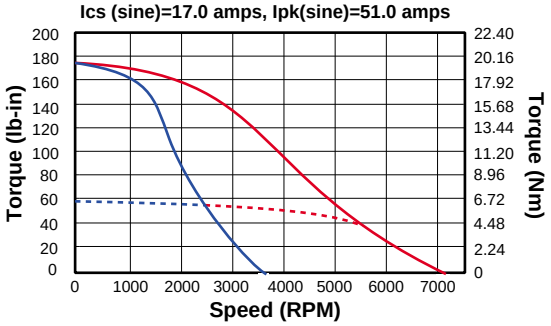
N0924JR

Ics (sine)=12.1 amps, Ipk(sine)=36.4 amps



N0924KR

Ics (sine)=17.0 amps, Ipk(sine)=51.0 amps





170 VDC 340 VDC

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92 mm, Resolver Feedback, Specifications*

Parameter	Symbol	Units	N0921F	N0921G	N0922G	N0922J	N0923H	N0923K	N0924J	N0924K
Stall Torque Continous[1]	T_{cs}	lb-in	17.4	17.4	30.9	31.1	46.1	45.4	61.1	61.3
		oz-in	278	279	495	498	737	727	977	980
		Nm	1.95	1.95	3.47	3.49	5.16	5.09	6.84	6.86
Stall Current Continuous[1,4,7]	I_{cs}(sine)	Amps Peak	5.3	7.4	7.3	11.3	11.1	19.4	12.1	17.0
Peak Torque[6]	T_{pk}	lb-in	52.1	52.3	92.8	93.4	138.3	136.3	183.1	183.8
		oz-in	834	836	1484	1494	2212	2181	2929	2940
		Nm	5.84	5.85	10.39	10.46	15.48	15.27	20.50	20.58
Peak Current[4,6,7]	I_{pk}(sine)	Amps Peak	15.9	22.1	21.8	33.8	33.4	58.3	36.4	51.0
Rated Speed[2]	ω_r	rpm	6000	7500	4700	7100	4500	7500	3600	5200
Current @ Rated Speed	I_r(sine)	Amps	4.7	6.2	6.5	8.7	10.0	14.7	11.2	14.6
Torque @ Rated Speed	T_r	lb-in	12.7	12.9	25.9	23.3	34.1	30.1	46.3	42.7
		oz-in	203	207	414	372	545	481	740	683
		Nm	1.42	1.45	2.90	2.60	3.82	3.37	5.18	4.78
Shaft Power @ Rated Speed	P_o	watts	901	1148	1378	1954	1814	2668	1970	2627
Voltage Constant[3,4]	K_b	Volts/rad/s	0.427	0.309	0.556	0.360	0.540	0.305	0.657	0.470
Voltage Constant[3,4]	K_e	Volts/KRPM	44.72	32.36	58.22	37.70	56.55	31.94	68.80	49.22
Torque Constant[8]	K_t(sine)	oz-in/Amp Peak	52.36	37.89	68.18	44.15	66.22	37.40	80.57	57.64
		Nm/Amp Peak	0.367	0.265	0.477	0.309	0.464	0.262	0.564	0.403
Resistance[3]	R	Ohms	3.72	1.94	2.32	0.96	1.28	0.42	1.22	0.62
Inductance[5]	L	mH	17.11	8.99	14.72	6.18	14.95	4.78	20.60	10.51
Maximum Bus Voltage	V_m	Volts DC	340	340	340	340	340	340	340	340
Thermal Res Wind-Amb	R_{th} w-a	°C/watt	1.06	1.06	0.91	0.91	0.7	0.7	0.62	0.62
Motor Constant	K_m	oz-in/√watt	31.35	31.41	51.69	52.03	67.59	66.64	84.23	84.52
		Nm/√watt	0.219	0.220	0.362	0.364	0.473	0.466	0.590	0.592
Viscous Damping	B	oz-in/Krpm	0.5	0.5	0.8	0.8	1.1	1.1	1.4	1.4
		Nm/krpm	3.5 E-3	3.5 E-3	5.6 E-3	5.6 E-3	7.7 E-3	7.7 E-3	9.8 E-3	9.8 E-3
Static Friction	T_f	oz-in	2.5	2.5	4.8	4.8	5.4	5.4	6.6	6.6
		Nm	1.8 E-2	1.8 E-2	3.4 E-2	3.4 E-2	3.8 E-2	3.8 E-2	4.6 E-2	4.6 E-2
Motor Thermal Time Constant	τ_{th}	minutes	21.6	21.6	30	30	35	35	36.6	36.6
Electrical Time Constant	τ_{elec}	millisecs	4.60	4.63	6.34	6.44	11.68	11.38	16.89	16.95
NeoMetric Mech. Time Const.	τ_{mch}	millisecs	1.2	1.2	0.7	0.7	0.5	0.5	0.4	0.4
J Series Mech. Time Constant	τ_{mch}	millisecs	10.0	10.0	3.9	3.9	2.4	2.4	N/A	N/A
Intermittent Torque Duration[9]	T_{2x}	seconds	48	48	39	39	61	61	61	61
Peak Torque Duration[10]	T_{3x}	seconds	17	17	13	13	16	16	15	15
NeoMetric Rotor Inertia	J	lb-in-sec^2	5.3 E-4	5.3 E-4	7.9 E-4	7.9 E-4	1.1 E-3	1.1 E-3	1.3 E-3	1.3 E-3
		kg-m^2	6.0 E-5	6.0 E-5	9.0 E-5	09.0 E-5	1.2 E-4	1.2 E-4	1.5 E-4	1.5 E-4
J Series Rotor Inertia	J	lb-in-sec^2	4.4 E-3	4.4 E-3	4.7 E-3	4.7 E-3	5.0 E-3	5.0 E-3	N/A	N/A
		kg-m^2	4.9 E-4	4.9 E-4	5.3 E-4	5.3 E-4	5.7 E-4	5.7 E-4	N/A	N/A
Number of Poles	Np		4	4	4	4	4	4	4	4
NeoMetric Weight	#	lbs	8.1	8.1	11.7	11.7	15.1	15.1	18.0	18.0
		kg	3.7	3.7	5.3	5.3	6.9	6.9	8.2	8.2
J Series Weight	#	lbs	9.9	9.9	13.5	13.5	16.9	16.9	N/A	N/A
		kg	4.5	4.5	6.1	6.1	7.7	7.7	N/A	N/A
Winding Class			H	H	H	H	H	H	H	H

* NeoMetric and J Series Specifications are identical unless otherwise noted.

1 *@ 25°C ambient, 150°C winding temperature, motor connected to a 10"x10"x1/4" aluminum mounting plate. @40C ambient derate phase currents and torques by 12%.*
2 *Maximum speed is 7500 RPM. For higher speed operation please call the factory.*
3 *Measured Line to Line, +/- 10%.*
4 *Value is measured peak of sine wave.*
5 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
6 *Initial winding temperature must be 60°C or less before peak current is applied.*
7 *Peak of the sinusoidal current in any phase for a sinusoidally commutated motor.*
8 *Total motor torque per peak of the sinusoidal amps measured in any phase, +/-10%.*
9 *Maximum time duration with 2 times rated current applied with initial winding temp at 60°C.*
10 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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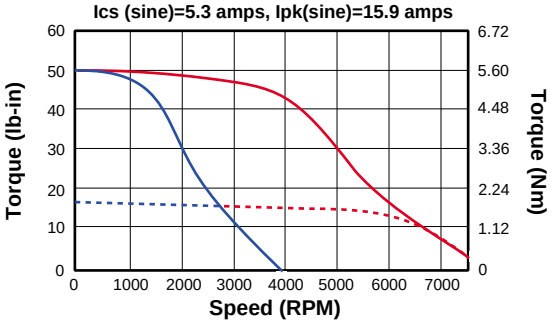
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92 mm, Resolver Feedback, Performance Curves

(Neometric & J Series data are identical unless otherwise noted)

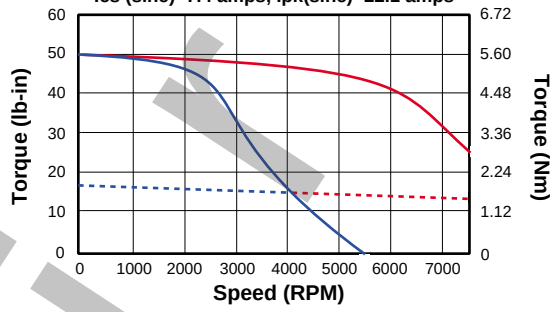
N0921FR

Ics (sine)=5.3 amps, Ipk(sine)=15.9 amps



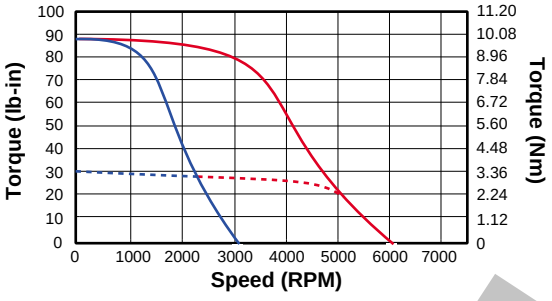
N0921GR

Ics (sine)=7.4 amps, Ipk(sine)=22.1 amps



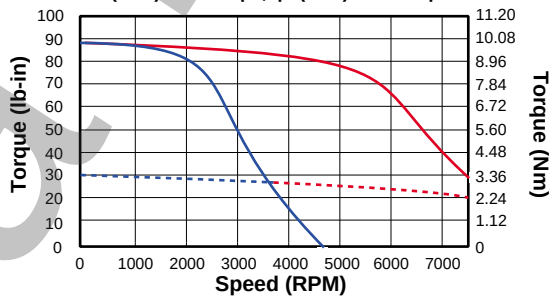
N0922GR

Ics (sine)=7.3 amps, Ipk(sine)=21.8 amps



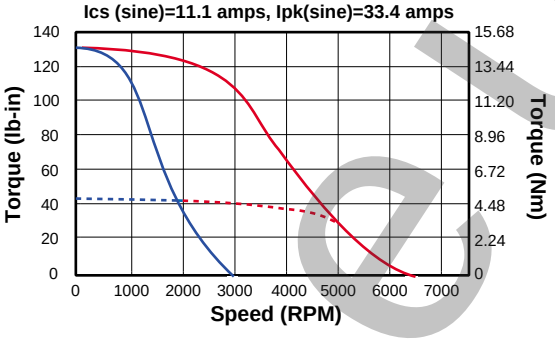
N0922JR

Ics (sine)=11.3 amps, Ipk(sine)=33.8 amps



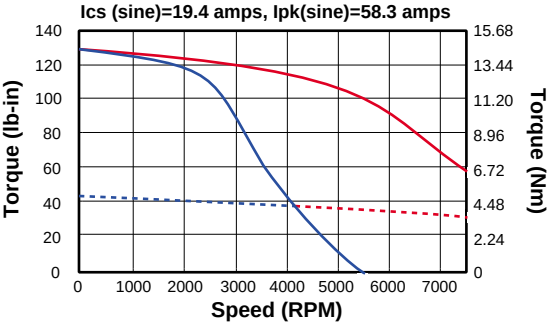
N0923HR

Ics (sine)=11.1 amps, Ipk(sine)=33.4 amps



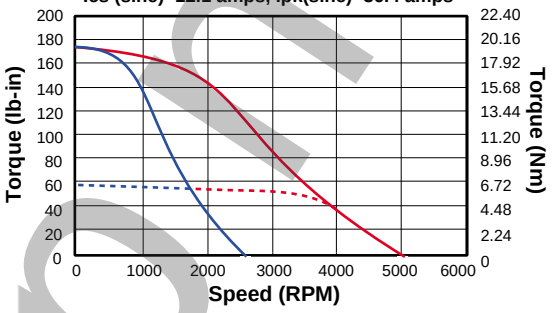
N0923KR

Ics (sine)=19.4 amps, Ipk(sine)=58.3 amps



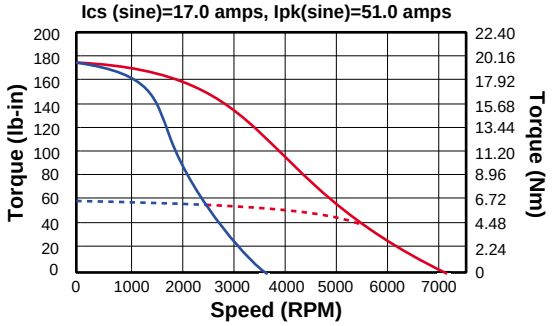
N0924JR

Ics (sine)=12.1 amps, Ipk(sine)=36.4 amps



N0924KR

Ics (sine)=17.0 amps, Ipk(sine)=51.0 amps





170 VDC 340 VDC

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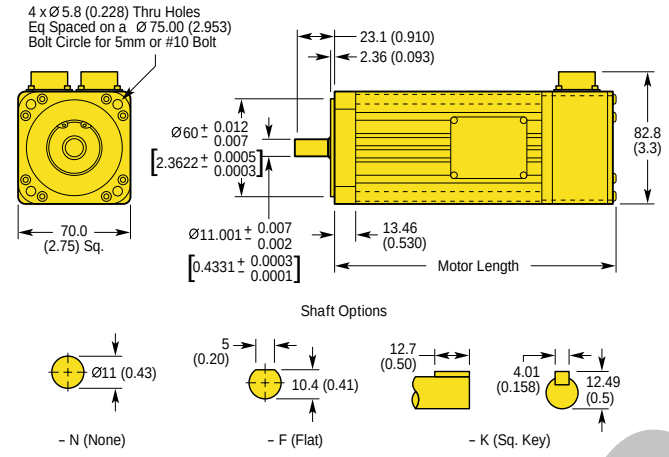
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NeoMetric & J Series Dimensional Drawings

70 mm Dimensional Drawing

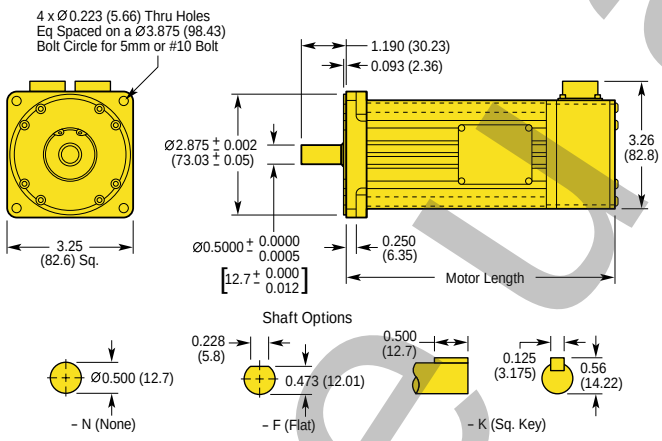
Dimensions in mm (inches)



Motor Sizes		
Model		**Motor Length**
N0701		125.5 (4.94)
N0702	J0701	150.9 (5.94)
N0703	J0702	176.3 (6.94)
N0704	J0703	201.7 (7.94)
N0701 w/ Brake		177.8 (7.00)
N0702 w/ Brake	J0701 w/ Brake	203.2 (8.00)
N0703 w/ Brake	J0702 w/ Brake	228.6 (9.00)
N0704 w/ Brake	J0703 w/ Brake	254.0 (10.00)

Size 34, Dimensional Drawing

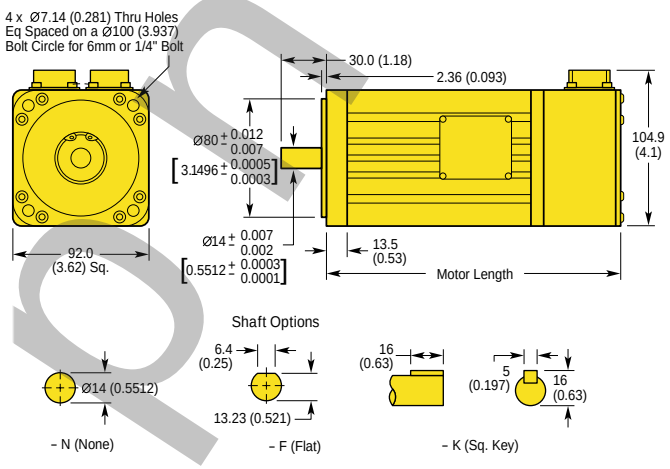
Dimensions in inches (mm)



Motor Sizes		
Model		**Motor Length**
N0341		4.94 (125.5)
N0342	J0341	5.94 (150.9)
N0343	J0342	6.94 (176.3)
N0344	J0343	7.94 (201.7)
N0341 w/ Brake		7.00 (177.8)
N0342 w/ Brake	J0341 w/ Brake	8.00 (203.2)
N0343 w/ Brake	J0342 w/ Brake	9.00 (228.6)
N0344 w/ Brake	J0343 w/ Brake	10.00 (254.0)

92 mm Dimensional Drawing

Dimensions in mm (inches)



Motor Sizes		
Model		**Motor Length**
N0921		168.4 (6.63)
N0922	J0921	206.5 (8.13)
N0923	J0922	244.6 (9.63)
N0924	J0923	282.7 (11.13)
N0921 w/ Brake		228.6 (9.00)
N0922 w/ Brake	J0921 w/ Brake	266.7 (10.50)
N0923 w/ Brake	J0922 w/ Brake	304.8 (12.00)
N0924 w/ Brake	J0923 w/ Brake	342.9 (13.50)

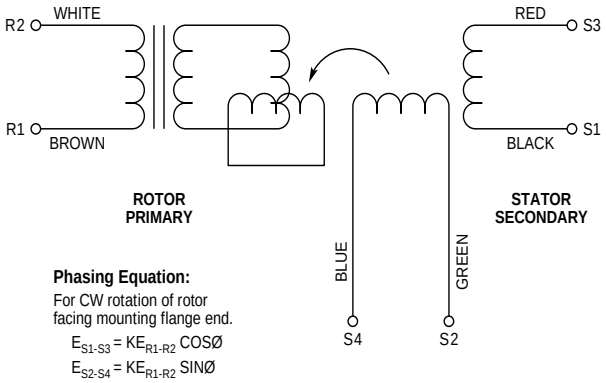
preview

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NeoMetric and J Series, Feedback Specifications

Resolver Schematic Diagram



Phasing Equation:
For CW rotation of rotor facing mounting flange end.

$E_{S1-S3} = KE_{R1-R2} \cos\emptyset$

$E_{S2-S4} = KE_{R1-R2} \sin\emptyset$

Resolver Specifications

Parameter	Value
Input voltage @ 7 kHz	4.25 volts
Input current, max	55 mA
Input power, nominal	0.12 watts
Impedance ZSO (@ 90°)	58+j145 ohms
Impedance ZRO	53+j72 ohms
Impedance ZRS	42+j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
DC rotor resistance	23 ±10% ohms
DC stator resistance	19 ±10% ohms
Sensitivity	35 mV/degree
Max error from EZ	±10 minutes
Phase shift, open circuit	5° leading, ±3" of arc
Null voltage, total	20 mV rms
Impedance ZSS	50+j128 ohms
Inertia	Incl. with motor spec.

Encoder Specifications

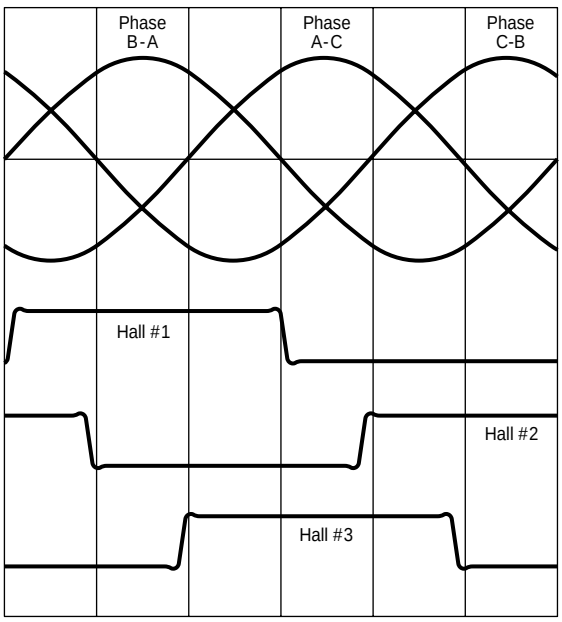
Mechanical		
Electrical	Accuracy	±2 min of arc
	Input power	5 VDC ±5%, 135 mA
	Operating frequency	100 kHz max
	Output device	26LS31
	Sink/Source, nominal	20 mA
	Suggested user interface	26LS32

Hall-Effect Specifications

Electrical		
	Input power	5 VDC ±5%, 80 mA
	Output device open collector	LM339
	Maximum pull up	12 VDC
	Sink	16 mA

Commutation Chart

Clockwise rotation as viewed from front shaft.



Electrically Released Brakes

Brakes	70 mm or 34 Frame	92 mm
Static rated torque	24 in-lb	72 in-lb
Coil voltage	24 VDC	24 VDC
Coil current	0.8 amps	0.52 amps
Weight	1.0 lbs	2.51 lbs
Inertia	0.000038 lb-in-sec^2	0.00015 lb-in-sec^2
Engage/Disengage	100/200 ms	100/250 ms

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Wiring and Cable Specifications

Flying Leads, Cabled and "MS" Connection Options

The **"FL" (Flying Lead) Connection** option for the NeoMetric and J Series motors features 18" leads extending from the motor body. Wire color codes are the same as listed below for "MS" wired NeoMetric and J Series motors. The "FL" option is only available on 70 mm/size 34 motors with encoder feedback.

The **"10" connection** option for the NeoMetric and J Series motors consists of 10 feet of hard-wired cable extending from the motor body. These cables terminate in flying leads. Wire color codes are the same as listed below for the "MS" connection option. The "10" option is only available on 70 mm/size 34 motors with encoder feedback.

The **"MS" connection** option for the NeoMetric and J Series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately . With the "MS" connection option, the motor phase wires are in one connector, and the hall, encoder and temperature switch wires are in the other connector. This option works well when using an amplifier with a built-in controller, or when all cables enter into a cabinet or enclosure and then are wired into a terminal strip. When specifying the "R" (resolver) feedback option, the motor phase wires reside in one connector, the resolver signal and temperature switch wires in the other.

Motor Connection

Designation	Pin Number MS14-12	Wire Color MS/RS Cables	Wire Color GS/GB Cables
Phase A	J	Red/Yellow	Black 1
Phase B	K	White/Yelow	Black 2
Phase C	L	Black/Yellow	Black 3
Ground	M	Green/Yellow	Green/Yellow
Shield	N.C.	Clear	N.C.

1 70 mm/size 34 motor connector is MS14-12. 92 mm motor connector is MS18-5.
2 Brake will operate regardless of polarity of connection.

Encoder/Hall Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Hall Ground	K	White/Green
Hall +5	M	White/Blue
Hall 1	T	White/Brown
Hall 2	U	White/Orange
Hall 3	P	White/Violet
Brake[2]	R	Red/Blue
Brake[2]	S	Red/Blue
Temp	L	Orange/Yellow
Temp	N	Orange/Yellow
Shield	N.C.	Clear

Resolver Feedback Connection

Designation	Pin Number MS14-12	Wire Color
S1, COS +	E	Black
S2, SIN +	L	Green
S3, COS -	J	Red
S4, SIN -	G	Blue
R1, EXC +	C	Brown
R2, EXC -	U	White
Temp	R	Orange/Yellow or Yellow
Temp	N	Orange/Yellow or Yellow
Brake[2]	S	Red/Blue
Brake[2]	T	Red/Blue
Shield	N.C.	Clear

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Wiring and Cable Specifications (continued)

"TQ" Connection Option (70mm/Size 34 Only)

The **"TQ" Connection** option for the NeoMetric or J series motors provides quick disconnect, bayonet style connectors attached to the motor body. Mating cables are specified and ordered separately. The "TQ" connection option joins the motor phase wires, temperature switch, and hall effect signals in one connector. The second connector has only encoder signals. This connection option applies well in applications where the hall and motor phase wires connect directly to an amplifier, while the encoder signals connect directly to a controller.

Motor/Hall Connection

Designation	Pin Number MS14-12	Wire Color
Phase A	J	Red/Yellow
Phase B	K	White/Yellow
Phase C	L	Black/Yellow
Ground	M	Green/Yellow
Temp	G	Orange/Yellow or Yellow
Temp	H	Orange/Yellow or Yellow
Shield	N.C.	Clear
Hall Ground	F	White/Green
Hall +5	B	White/Blue
Hall 1	C	White/Brown
Hall 2	D	White/Orange
Hall 3	E	White/Violet

Encoder Feedback Connection

Designation	Pin Number MS14-18	Wire Color
Encoder +5	H	Red
Encoder Ground	G	Black
CH A +	A	White
CH A -	B	Yellow
CH B +	C	Green
CH B -	D	Blue
Index +	E	Orange
Index -	F	Brown
Brake[1]	R	Red/Blue
Brake[1]	S	Red/Blue

[1] *Brake will operate regardless of polarity of connection*

"PT" Connection Option

The **"PT" connection** option features two 1/2 - 14 NPT threaded holes in the connector housing, and internal screw terminal connections for motor and feedback leads. This connection option is recommended when running cable conduit between the motor and an enclosure containing the amplifier and controller. The "PT" connection option is only available on 92mm motors.

preview

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Low Cost, High Performance

The M Series is Compumotor's newest series of motors. Completing Compumotor's line of servos, the M Series moves innovative design into larger-frame motors, yet they remain affordably priced. An eight-pole design allows for highly dynamic motion while minimizing power loss within the motor itself.

Features

- Size 105, 145 and 205mm diameters
- 53 to 625 lb-in continuous torque
- Brushless construction
- Thermal protection
- IP65 option
- Resolver and encoder feedback options
- Two-year warranty
- CAD (.dxf) drawings available
- CE compliant
- Electrically released brakes available

Part Numbering System

M	1053	K	J-	K	MS	N
M Series	*Frame, Magnet Length* 1053 1453 1455 1054 1454 2052 2053 2054	***Winding*** J, K, L, M, N, P, R, S	***Feedback*** J - 2000 ppr encoder R - Resolver[1]	***Shaft*** N - Normal K - Keyway[3]	***Connection*** MS - Military style PT - Pipe thread[2]	***Options*** N - None V - IP65 B - Brake

1 *Standard resolver not compatible w/ APEX drives. Please contact Compumotor's Custom Servo Motor group for motors compatible with the APEX series of drives*
2 *Pipe thread only available in M2053 and M2054 resolver motors*
3 *Standard*

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105mm, 145mm & 205mm Encoder Feedback Specifications

Parameter	Symbol	Units	M1053K	M1054K	M1453L	M1454N	M1455P	M2052P	M2053R	M2054S
Stall Torque Cont [1]	Tcs	oz-in	1171.2	1438.8	3867.9	5290.6	6454.1	9938.4	13871.77	17842.30
Stall Torque Cont [1]	Tcs	lb-in	73.2	90.0	241.7	330.6	403.4	621.2	867.0	1115.1
Stall Torque Cont [1]	Tcs	Nm	8.3	10.2	27.3	37.4	45.6	70.2	97.96	126.00
Stall Current Cont [1,4,8]	Ics(sine)	Amps peak	20.32	23.70	40.70	55.67	63.64	60.94	85.05	109.40
Stall Current Cont [1]	Ics(RMS)	Amps RMS	14.37	16.76	28.78	39.36	45.00	43.09	60.14	77.36
Peak Torque [6]	Tpk	oz-in	3513.6	4316.4	11603.7	15871.7	19362.3	29815.3	41615.32	53526.90
Peak Torque	Tpk	lb-in	219.6	269.8	725.2	992.0	1210.1	1863.5	2601.0	3345.4
Peak Torque [6]	Tpk	Nm	24.9	30.6	82.3	112.5	137.3	211.4	293.8	377.9
Peak Current [4,6,8]	Ipk(sine)	Amps Peak	61.0	71.1	122.1	167.0	190.9	182.8	255.16	328.20
Peak Current [6]	Ipk(RMS)	Amps RMS	43.1	50.3	86.3	118.1	135.0	129.3	180.43	232.07
Rated Speed [2]	Wr	rpm	5000	5000	3000	3000	3000	1700	3000	3000
Current @ Rated Speed	Ir(sine)	Amps Peak	17.82	18.34	39.11	52.70	59.10	58.77	76.72	97.07
Current @ Rated Speed	Ir(RMS)	Amps RMS	12.60	12.97	27.65	37.27	41.79	41.56	54.25	68.64
Torque @ Rated Speed	Tr	oz-in	1011	1091.7	3700	4980	5960	9526	12425.39	15717.20
Torque @ Rated Speed	Tr	Nm	7.14	7.71	26.13	35.17	42.09	67.27	87.75	111.00
Shaft Power @ Rated Speed	Po	watts	3739	4037	8210	11050	13225	11978	27571.14	34875.44
Voltage Constant [3,4]	Kb	volts/rad/s	0.4700	0.4950	0.7750	0.7750	0.8270	1.3300	1.33	1.33
Voltage Constant [3,4]	Ke	volts/Krpm	49.22	51.84	81.16	81.16	86.60	139.28	139.28	139.28
Torque Constant [3,9]	Kt(sine)	oz-in/ Amps Peak	57.64	60.70	95.04	95.04	101.41	163.10	163.10	163.10
Torque Constant [3,4]	Kt(trap)	oz-in/ Amps DC	66.55	70.09	109.74	109.74	117.10	188.33	188.33	188.33
Torque Constant [3]	Kt(RMS)	oz-in/ Amps RMS	81.51	85.84	134.40	134.40	143.42	230.65	230.65	230.65
Resistance [3]	R	Ohms	0.48	0.36	0.22	0.12	0.097	0.170	0.10	0.10
Inductance [5]	L	mH	2.03	1.67	1.94	1.05	0.79	1.90	1.59	1.27
Max Bus Voltage	Vm	Volts DC	560	560	560	560	560	560	560	560
Thermal Resistance Wind-Amb	Rth w-a	C/watt	0.50	0.49	0.28	0.26	0.252	0.157	0.137	0.118
Motor Constant	Km	oz-in/ sqrt(watt)	96.06	116.82	236.12	312.90	375.80	456.76	595.55	711.81
Viscous Damping	B	oz-in/Krpm	2.4	4.5	3.0	6.3	7.3	17.0	21.0	28
Static Friction	Tf	oz-in	4.0	6.0	7.0	10.0	12.0	21.0	23.5	30
Elect Time Constant	Tau_elec	millsecs	4.23	4.64	8.98	8.54	8.17	11.24	15.90	18.14
Mech Time Constant	Tau_mch	millisecs	1.0	0.9	0.6	0.4	0.4	0.8	0.6	0.4
Rotor Inertia	J	lb-in-sec^2	4.2E-03	5.5E-03	1.4E-02	1.9E-02	2.4E-02	7.1E-02	9.7E-02	9.70E-02
Rotor Inertia	J	kgm^2	4.8E-04	6.2E-04	1.6E-03	2.2E-03	2.7E-03	8.0E-03	1.1E-02	1.10E-02
Rated Winding Temp	WTr	C	125	125	125	125	125	125	125	125
Rated Ambient Temp	Tamb	C	20	20	20	20	20	20	20	20
Rated Case Temp	Tcase	C	106	106	106	89	100	98	98	98
Number of Poles	Np		8	8	8	8	8	8	8	8
Weight	#	lbs	19	22.9	30.80	39.60	48.00	97.00	130	162
Winding Class			H	H	H	H	H	H	H	H

1 @ 40° C ambient, derate phase currents and torques by 7%.
2 For higher-speed operation, please call the factory.
3 Measured line to line, +/- 10%.
4 Value is measured peak of sine wave.
5 +/- 30%, line to line, inductance bridge measurement @ 1Khz.
6 Initial winding temperature mut be 60° C or less before peak current is applied.
7 Direct current through a pair of motor phases of a trapezoidally (six state) commutated motor.
8 Peak of sinusoidal current in any phase for a sinusoidally commutated motor.
9 Total motor torque per peak of the sinusoidal amps measured in any phase, +/- 10%.
10 Maximum time duration with 2 times (or 3 times) rated current applied with initial winding temperature at 60° C.

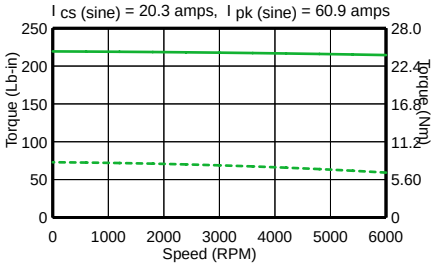
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M Series Performance Curves

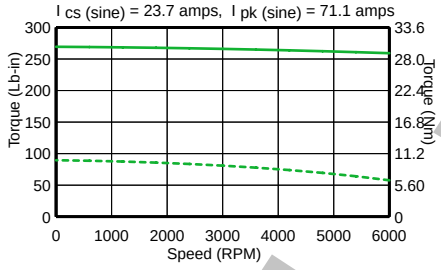
M1053K

I cs (sine) = 20.3 amps, I pk (sine) = 60.9 amps



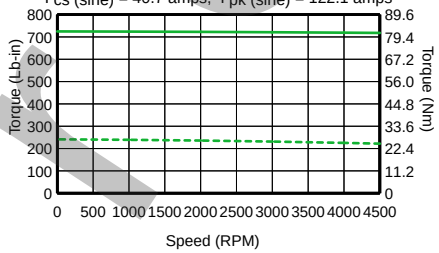
M1054K

I cs (sine) = 23.7 amps, I pk (sine) = 71.1 amps



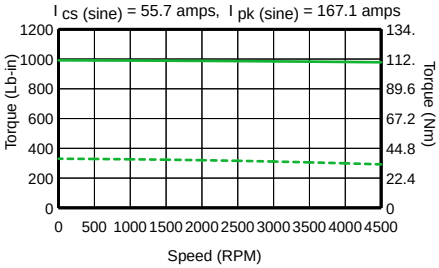
M1453L

I cs (sine) = 40.7 amps, I pk (sine) = 122.1 amps



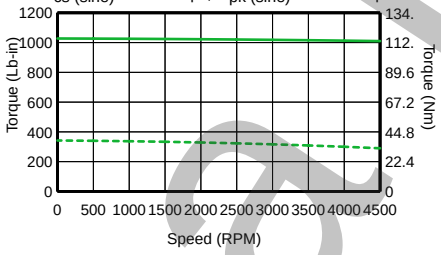
M1454N

I cs (sine) = 55.7 amps, I pk (sine) = 167.1 amps



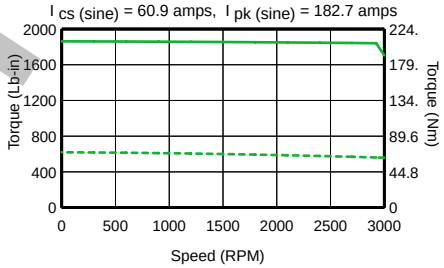
M1455P

I cs (sine) = 63.6 amps, I pk (sine) = 190.8 amps



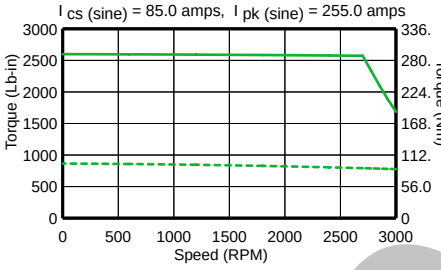
M2052P

I cs (sine) = 60.9 amps, I pk (sine) = 182.7 amps



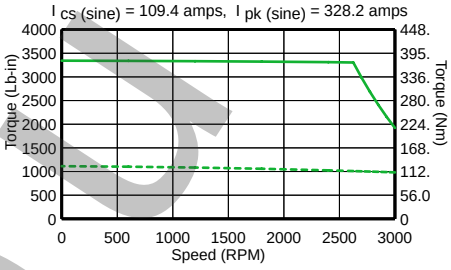
M2053R

I cs (sine) = 85.0 amps, I pk (sine) = 255.0 amps



M2054S

I cs (sine) = 109.4 amps, I pk (sine) = 328.2 amps





(560VDC)

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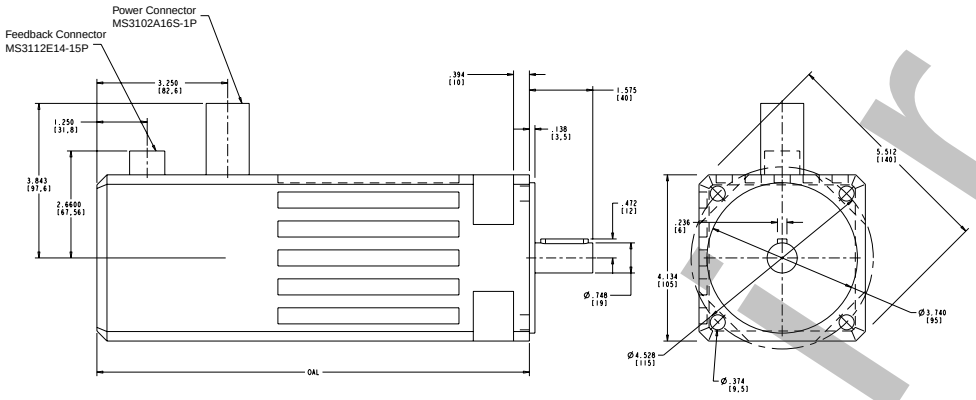
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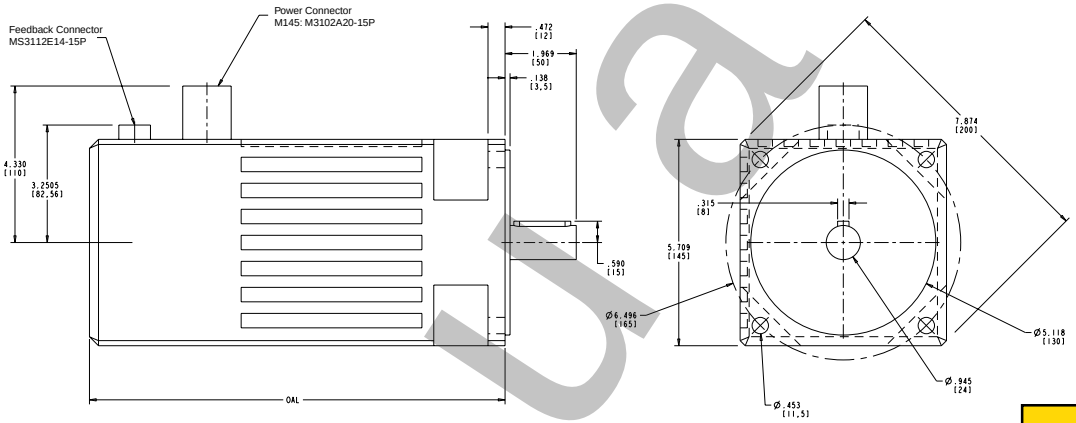
M Series Dimensional Drawings

Dimensions in inches (mm)

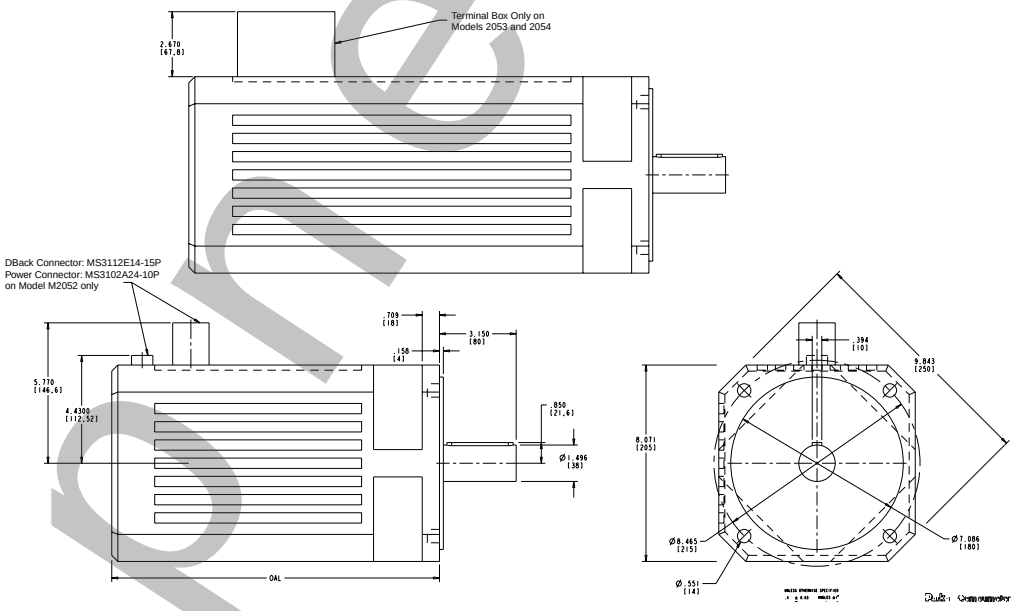
105 mm Dimensional Drawing



145 mm Dimensional Drawing



205 mm Dimensional Drawing



Motor Sizes

Model	Motor Length
M1053	10.75 (273.0)
M1054	12.48 (317.0)
M1453	11.50 (292.0)
M1454	13.94 (354.0)
M1455	16.38 (416.0)
M2052-MS	13.46 (342.0)
M2053-PT	16.18 (411.0)
M2054-PT	18.90 (480.1)

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Wiring and Cable Specifications

"MS" Connection Options

The M Series Motors are available standard with "MS" connectors. These bayonet-style connectors provide quick-disconnect. Mating cables are specified and ordered separately. With the "MS" connection option, the motor phase and brake wires are in one connector, and the hall, encoder, and temperature switch wires are in the other connector. This option works well when using an amplifier with a built-in controller, or when all cables enter into a cabinet or enclosure and then are wired into a terminal strip.

"PT" Connection Options

The M2053 and M2054 motors with resolver feedback are available with the PT connector option due to the high current requirements of these motors. A terminal block is available inside the motor housing to make the required connections.

Motor Connection

Designation	Pin Number	Wire Color
Phase A	A	Black #1
Phase B	B	Black #2
Phase C	C	Black #3
Ground	D/E	Green/Yellow
Shield	Shell	Clear
Brake	F	Red/Blue
Brake	G	Red/Blue

Encoder Connection

Designation	Pin Number	Wire Color
CH A +	C	White
CH A -	D	Yellow
CH B +	A	Green
CH B -	B	Blue
CH Z +	E	Orange
CH Z -	F	Brown
Hall 1	H	White/Brown
Hall 2	J	White/Orange
Hall 3	G	White/Violet
+5V	K	Red
0V	L	Black
Temp	M	Yellow/Orange
Shield	N	Shield
Temp	R	Yellow/Orange

Resolver Connection

Designation	Pin Number	Wire Color
SIN +	A	Green
SIN -	B	Blue
COS +	D	Black
COS -	E	Red
EXC +	G	Brown
EXC -	H	White
Temp	K	Yellow/Orange
Temp	L	Yellow/Orange
Drain	M	

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M Series, Feedback Specifications

Encoder Specifications

Mechanical

Electrical

Accuracy	±2 min of arc
Input power	5 VDC ±5%, 135 mA
Operating frequency	300 kHz max
Output device	26LS31
Sink/Source, nominal	20 mA

Hall-Effect Specifications

Electrical

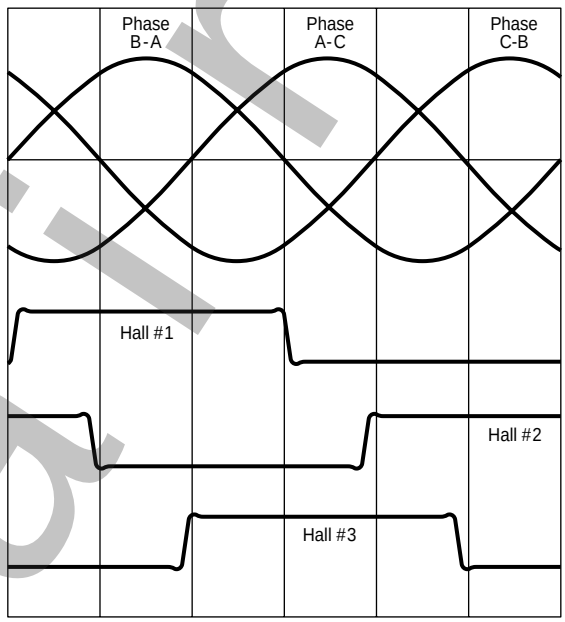
Input power	5 VDC ±5%, 80 mA
Output device open collector	LM2901
Maximum pull up	12 VDC
Sink	16 mA

Resolver Specifications

Parameter	Value
Input voltage @ 7 kHz	4.25 volts
Input current, max	55 mA
Input power, nominal	0.12 watts
Impedance ZSO (@ 90°)	58+j145 ohms
Impedance ZRO	53+j72 ohms
Impedance ZRS	42+j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
DC rotor resistance	23 ±10% ohms
DC stator resistance	19 ±10% ohms
Sensitivity	35 mV/degree
Max error from EZ	±10 minutes
Phase shift, open circuit	5° leading, ±3" of arc
Null voltage, total	20 mV rms
Impedance ZSS	50+j128 ohms
Inertia	Incl. with motor spec.

Commutation Chart

Clockwise rotation as viewed from front shaft.



Brakes

Type	Units	105mm	145mm	205mm
Supply voltage	vdc	24	24	24
Current @ 20C	amps	1.1	1.8	1.65
Resistance @ 20C	ohms	22	13.2	14.5
Max static torque	Nm	10	30	100
Max static torque	in-lb	89.2	267.6	892
Moment of inertia	kgm^2 10E-3	0.0625	0.195	1
Moment of inertia	lb-in-sec^2 10E-3	0.553125	1.72575	8.85

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Slotless Linear Servo Motor

Compumotor's SL Series brushless linear servo motors feature the same slotless winding design made popular by our SM and SE Series rotary servo motors. Along with reduced manufacturing costs, the slotless design creates several performance advantages when compared to traditional ironcore and ironless linear servo motors:

- Single-row magnet bar
- Lower cost and weight (compared to ironless design)
- Better heat dissipation (compared to ironless design)
- More force per package size (compared to ironless design)
- Lighter weight forcer (compared to ironcore design)
- Lower attractive forces (compared to ironcore design)
- Less cogging force (compared to ironcore design)

Forcer Part Numbering System

SL	063	08	A	H -	10	N
SL Series	*Forcer Width* 043 063 102 140	*# of Poles* 04 06 08 10 12	*Winding* A[1]	*Commutation* N - None H - Hall effect	*Connection* FL - Flying Leads 10[2] - 10' Hi-Flex Cable 25[2] - 25' Hi-Flex Cable	*Options* N - None W - Water Cooling[3]

Magnet Bar Part Numbering System

LB	063 -	210
SL Series Magnet Bar	*Forcer Width* 043 063 102 140	*Bar Length* 042: 42mm 084: 84mm 210: 210mm 336: 336mm 462: 462mm 588: 588mm



1 *Special windings can be designed to meet customer specifications. Please consult factory.*

2 *For motors without hall effect commutation, motor phase and temperature switch wires are located in a single cable. For motors with hall effect commutation, motor phase wires are in one cable, hall effect and temperature switch wires are in a second cable.*

3 *Not available on SL043.*

preview

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The Linear Motor Concept

The idea is simple enough. Take a conventional rotary servo motor and unwrap it. What was the stator is now a forcer and the rotor becomes a magnet bar. With this design, the motor is connected directly to the load. Direct linear motion is achieved without any rotary to linear transmission devices. The direct coupling of the forcer to the load provides these performance benefits:

- High Speeds
- Zero Backlash
- Fast Response
- High Precision
- High Stiffness
- Low Maintenance

Summary Chart: Below is a summary of linear motor attributes and how each technology compares to the others.

ATTRIBUTE	IronCore	AirCore	Slotless
Cost	Low	High	Lowest
Attractive Force	Highest	None	Moderate
Cogging	Highest	None	Moderate
Force / Size	Best	Moderate	Good
Thermal Characteristics	Best	Lowest	Good
Forcer Weight	Heaviest	Lightest	Moderate
Forcer Strength	Best	Worst	Good

SL043, Uncooled, Specifications (Preliminary)

Parameter	Symbol	Units	SL04304A	SL04306A	SL04308A	SL04310A	SL04312A
Peak Force[1, 3]	T_{pk}	N	60	81	102	129	168
		lbf	13.5	18	23	29	37.5
Continuous Stall Force[1, 2]	F_{cs}	N	20	27	34	43	56
		lbf	4.5	6	7.5	9.7	12.5

1 *SL043 specifications are preliminary.*
2 *Measured Line to Line, +/- 10%.*
3 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*

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SL063, General Specifications

Parameter	Symbol	Units	SL06304A	SL06306A	SL06308A	SL06310A	SL06312A
Voltage Constant[1,2]	K_b	Volts/m/s	12.8	19.2	25.6	32.0	38.4
		Volts/in/s	0.33	0.49	0.65	0.81	0.98
Force Constant[8]	K_f(sine)	N/Amp Peak	11.09	16.63	22.17	27.71	33.26
		lbf/Amp Peak	2.49	3.74	4.99	6.23	7.48
Resistance[1]	R	Ohms	5.2	7.7	10.3	12.9	15.4
Inductance[3]	L	mH	1.96	2.94	3.92	4.90	5.88
Maxumum Bus Voltage	V_m	Volts DC	340	340	340	340	340
Motor Constant	K_m	N/√watt	5.63	6.90	7.97	8.91	9.79
Motor Thermal Time Constant	τ_{th}	minutes	37	37	37	37	37
Electrical Time Constant	τ_{elec}	millisecs	0.38	0.38	0.38	0.38	0.38
Mechanical Time Constant	τ_{mch}	millisecs	0.013	0.012	0.011	0.010	0.010
Intermittent Force Duration[4]	F_{2x}	seconds	13	13	16	15	17
Peak Force Duration[5]	F_{3x}	seconds	5	5	6	6	6
Magnetic Attraction[6]	F_a	N	223	334	445	556	668
		lbf	50	75	100	125	150
Electrical Pitch[7]	P_e	mm	42	42	42	42	42
Forcer Mass	M_f	kg	0.41	0.55	0.69	0.80	0.95
		lb	0.09	1.2	1.5	1.8	2.1
Rated Winding Temperature	T_{max}	°C	125	125	125	125	125
Winding Class			H	H	H	H	H

SL063, Uncooled, Specifications

Parameter	Symbol	Units	SL06304A	SL06306A	SL06308A	SL06310A	SL06312A
Peak Force[3]	T_{pk}	N	122	183	240	283	342
		lbf	27	41	54	64	77
Continuous Stall Force[1]	F_{cs}	N	41	61	80	94	114
		lbf	9	14	18	21	26
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	11.0	11.0	10.8	10.2	10.3
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	3.7	3.7	3.6	3.4	3.4
Thermal Resistance[1]	R_{th}	°C/watt	1.38	0.92	0.71	0.64	0.53

1 *Measured Line to Line, +/- 10%.*
2 *Value is measured peak of sine wave.*
3 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
4 *Maximum Time duration with 2 times rated current applied with initial winding temp at 60°C.*
5 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*
6 *Measured with a 0.76mm gap*
7 *Distance from the leading edge of a north pole to the leading edge of the next north pole*
8 *Total motor torque per peak of the sinusiodal amps measured in any phase, +/-10%.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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SL063, Air Cooled, Specifications

Parameter	Symbol	Units	SL06304A	SL06306A	SL06308A	SL06310A	SL06312A
Peak Force[3]	T_{pk}	N	122	183	240	283	342
		lbf	27	41	54	64	77
Continuous Stall Force [1]	F_{cs}	N	46	64	86	105	125
		lbf	10.3	14.4	19.3	23.6	28.1
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	11.0	11.0	10.8	10.2	10.3
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	4.1	3.8	3.9	3.8	3.8
Thermal Resistance[1]	R_{th}	°C/watt	1.08	0.84	0.61	0.52	0.44

SL063, Water Cooled, Specifications

Parameter	Symbol	Units	SL06304A	SL06306A	SL06308A	SL06310A	SL06312A
Peak Force[3]	T_{pk}	N	122	183	240	283	342
		lbf	27	41	54	64	77
Continuous Stall Force[1]	F_{cs}	N	53	79	119	148	182
		lbf	10	11.9	17.8	26.7	40.9
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	11.0	11.0	10.8	10.2	10.3
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	4.8	5.2	5.4	5.3	5.5
Thermal Resistance[1]	R_{th}	°C/watt	0.81	0.47	0.32	0.26	0.21

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SL102, General Specifications

Parameter	Symbol	Units	SL10204A	SL10206A	SL10208A	SL10210A	SL10212A
Voltage Constant[1,2]	K_b	Volts/m/s	13.2	19.8	26.4	33	39.6
		Volts/in/s	0.34	0.50	0.67	0.84	1.01
Force Constant[8]	K_f(sine)	N/Amp Peak	11.42	17.13	22.84	28.54	34.26
		lbf/Amp Peak	2.57	3.85	5.13	6.41	7.70
Resistance[1]	R	Ohms	2.5	3.75	5	6.25	7.5
Inductance[3]	L	mH	0.77	1.16	1.54	1.93	2.31
Maxumum Bus Voltage	V_m	Volts DC	340	340	340	340	340
Motor Constant	K_m	N/√watt	8.34	10.21	11.79	13.18	14.45
Motor Thermal Time Constant	τ_{th}	minutes	28.3	31.7	35	36.7	36.7
Electrical Time Constant	τ_{elec}	millisecs	0.31	0.31	0.31	0.31	0.31
Mechanical Time Constant	τ_{mch}	millisecs	0.012	0.011	0.01	0.01	0.009
Intermittent Force Duration[4]	F_{2x}	seconds	26	36	40	45	50
Peak Force Duration[5]	F_{3x}	seconds	10	12	13	14	15
Magnetic Attraction[6]	F_a	N	444.9	667.2	889.6	1112	1334.4
		lbf	99.98	149.93	199.91	249.89	299.87
Electrical Pitch[7]	P_e	mm	42	42	42	42	42
Forcer Mass	M_f	kg	0.86	1.16	1.43	1.66	1.95
		lb	1.89	2.56	3.15	3.66	4.30
Rated Winding Temperature	T_{max}	°C	125	125	125	125	125
Winding Class			H	H	H	H	H

SL102, Uncooled, Specifications

Parameter	Symbol	Units	SL10204A	SL10206A	SL10208A	SL10210A	SL10212A
Peak Force[3]	T_{pk}	N	234.9	318.4	412.5	520.8	625.1
		lbf	52.79	71.55	92.70	117.03	140.47
Continuous Dynamic Force[1, 9]	F_{cs}	N	90.8	121.3	155.3	197.7	239.4
		lbf	20.41	27.27	34.91	44.45	53.82
Continuous Stall Force[1]	F_{cs}	N	78.3	106.1	137.5	173.6	208.4
		lbf	17.60	23.84	30.90	39.01	46.83
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	20.6	18.6	18.1	18.2	18.2
Dynamic Current Continuous[1,2,4,9]	I_{cs}(sine)	Amps Peak	7.94	7.07	6.79	6.92	6.98
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	6.85	6.2	6.02	6.08	6.08
Thermal Resistance[1]	R_{th}	°C/watt	0.815	0.665	0.53	0.414	0.345

1 *Measured Line to Line, +/- 10%.*
2 *Value is measured peak of sine wave.*
3 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
4 *Maximum Time duration with 2 times rated current applied with initial winding temp at 60°C.*
5 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*
6 *Measured with a 0.76mm gap*
7 *Distance from the leading edge of a north pole to the leading edge of the next north pole*
8 *Total motor torque per peak of the sinusiodal amps measured in any phase, +/-10%*
9 *Dynamic force and current measured at a carriage velocity of .5m/s.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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SL102, Air Cooled, Specifications

Parameter	Symbol	Units	SL10204A	SL10206A	SL10208A	SL10210A	SL10212A
Peak Force	T_{pk}	N	233.4	325.5	399.7	476.3	534.2
		lbf	52.45	73.12	89.82	107.03	120.04
Continuous Stall Force	F_{cs}	N	116.7	162.7	199.8	238.2	267.1
		lbf	26.22	36.56	44.90	53.53	60.02
Peak Current	I_{pk}(sine)	Amps Peak	20.4	19	17.5	16.7	15.6
Stall Current Continuous	I_{cs}(sine)	Amps Peak	10.21	9.5	8.75	8.34	7.8
Thermal Resistance	R_{th}	°C/watt	0.367	0.283	0.25	0.22	0.21

SL102, Water Cooled, Specifications

Parameter	Symbol	Units	SL10204A	SL10206A	SL10208A	SL10210A	SL10212A
Peak Force[3]	T_{pk}	N	288.6	412.6	523	644.9	748.3
		lbf	64.85	92.72	117.53	144.92	168.16
Continuous Stall Force[1]	F_{cs}	N	144.3	206.3	261.5	322.5	374.2
		lbf	32.43	46.36	58.76	72.47	84.09
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	25.3	24.1	22.9	22.6	21.8
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	12.63	12.04	11.45	11.3	10.92
Thermal Resistance[1]	R_{th}	°C/watt	0.24	0.176	0.15	0.12	0.107

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SL140, General Specifications

Parameter	Symbol	Units	SL14004A	SL14006A	SL14008A	SL14010A	SL14012A
Voltage Constant[1,2]	K_b	Volts/m/s	22	33	44	55	66
		Volts/in/s	0.56	0.84	1.12	1.40	1.68
Force Constant[8]	K_t(sine)	N/Amp Peak	19.05	28.58	38.1	47.6	57.16
		lbf/Amp Peak	4.28	6.42	8.56	10.70	12.84
Resistance[1]	R	Ohms	4.42	5.13	6.84	8.54	10.25
Inductance[3]	L	mH	1.25	1.87	2.5	3.12	3.74
Maxumum Bus Voltage	V_m	Volts DC	340	340	340	340	340
Motor Constant	K_m	N/√watt	10.46	14.57	16.8	18.82	20.61
Motor Thermal Time Constant	τ_{th}	minutes	18.3	21.7	25	25	25
Electrical Time Constant	τ_{elec}	millisecs	0.28	0.36	0.37	0.37	0.36
Mechanical Time Constant	τ_{mch}	millisecs	0.011	0.008	0.007	0.006	0.006
Intermittent Force Duration[4]	F_{2x}	seconds	181	181	196	187	160
Peak Force Duration[5]	F_{3x}	seconds	73	64	77	73	63
Magnetic Attraction[6]	F_a	N	667.2	1001	1334	1668	2002
		lbf	149.93	224.94	299.78	374.83	449.89
Electrical Pitch[7]	P_e	mm	42	42	42	42	42
Forcer Mass	M_f	kg	1.2	1.6	2	2.3	2.7
		lb	2.64	3.52	4.41	5.07	5.95
Rated Winding Temperature	T_{max}	°C	125	125	125	125	125
Winding Class			H	H	H	H	H

SL140, Uncooled, Specifications

Parameter	Symbol	Units	SL14004A	SL14006A	SL14008A	SL14010A	SL14012A
Peak Force[3]	T_{pk}	N	276	402	491	606	739
		lbf	62.02	90.34	110.34	136.18	166.07
Continuous Dynamic Force[1, 9]	F_{cs}	N	127.3	193.3	238.9	291.1	361.1
		lbf	28.62	43.46	53.71	65.45	81.18
Continuous Stall Force[1]	F_{cs}	N	92	134	164	202	246
		lbf	20.67	30.11	36.85	45.39	55.28
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	14.5	14.1	12.9	12.7	12.9
Dynamic Current Continuous[1,2,4,9]	I_{cs}(sine)	Amps Peak	6.68	6.76	6.27	6.11	6.32
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	4.83	4.69	4.29	4.24	4.31
Thermal Resistance[1]	R_{th}	°C/watt	0.923	0.847	0.76	0.623	0.503

1 *Measured Line to Line, +/- 10%.*
2 *Value is measured peak of sine wave.*
3 *+/-30%, Line-to-Line, inductance bridge measurement @1Khz.*
4 *Maximum Time duration with 2 times rated current applied with initial winding temp at 60°C.*
5 *Maximum time duration with 3 times rated current applied with initial winding temp at 60°C.*
6 *Measured with a 0.76mm gap*
7 *Distance from the leading edge of a north pole to the leading edge of the next north pole*
8 *Total motor torque per peak of the sinusiodal amps measured in any phase, +/-10%*
9 *Dynamic force and current measured at a carriage velocity of .5m/s.*

Note: These specifications are based on theoretical motor performance and are not specific to any amplifier.

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SL140, Air Cooled, Specifications

Parameter	Symbol	Units	SL14004A	SL14006A	SL14008A	SL14010A	SL14012A
Peak Force[3]	T_{pk}	N	307	471	601	722	806
		lbf	68.99	105.84	135.06	162.25	181.12
Continuous Stall Force[1]	F_{cs}	N	153	236	301	361	403
		lbf	34.38	53.03	67.64	81.12	90.56
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	16.1	16.5	15.8	15.2	14.1
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	8	8.25	7.89	7.58	7.05
Thermal Resistance[1]	R_{th}	°C/watt	0.333	0.274	0.23	0.2	0.188

SL140, Water Cooled, Specifications

Parameter	Symbol	Units	SL14004A	SL14006A	SL14008A	SL14010A	SL14012A
Peak Force[3]	T_{pk}	N	397	582	713	852	951
		lbf	89.21	130.79	160.22	191.46	213.71
Continuous Stall Force[1]	F_{cs}	N	198	291	356	426	475
		lbf	44.49	65.39	80.00	95.73	106.74
Peak Current[2,3,4]	I_{pk}(sine)	Amps Peak	20.8	20.4	18.7	17.9	16.6
Stall Current Continuous[1,2,4]	I_{cs}(sine)	Amps Peak	10.4	10.2	9.35	8.95	8.32
Thermal Resistance[1]	R_{th}	°C/watt	0.2	0.18	0.16	0.14	0.135

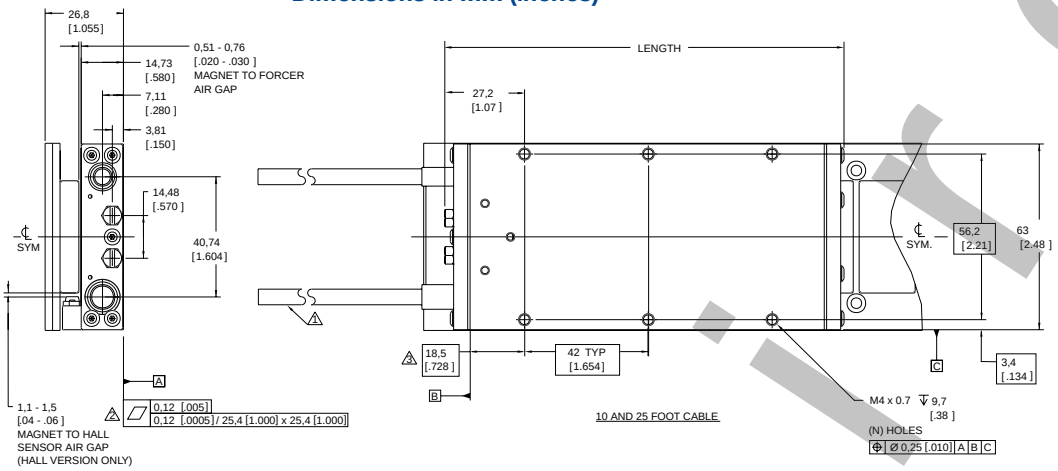
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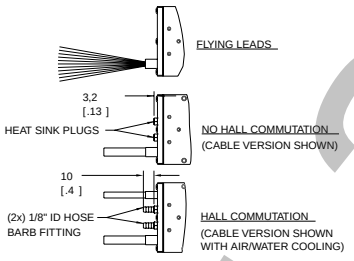
SL063 Dimensional Drawings

Dimensions in mm (inches)



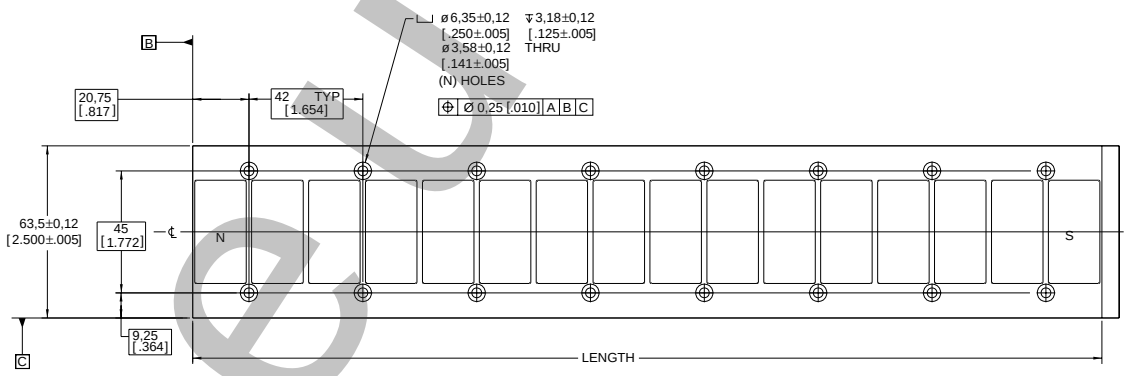
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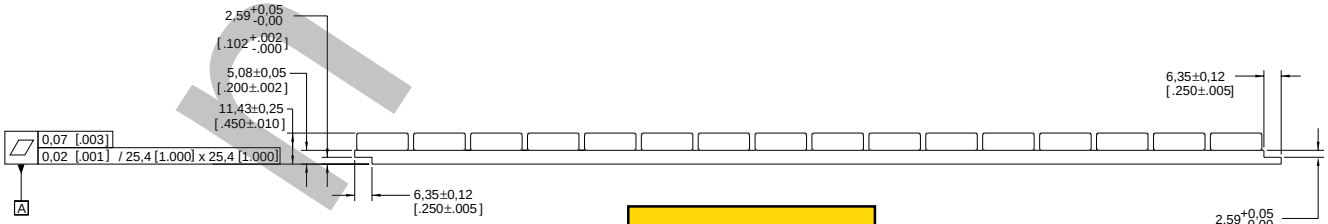
1. FLEX CABLE IS DESIGNED FOR 10 MILLION CYCLES AT A BEND RADIUS > 80 MM. DO NOT FLEX CABLES WITHIN 30 MM OF CABLE EXIT.
2. FORCER MOUNTING SURFACE MUST MEET THIS FLATNESS SPEC.
3. DIMENSION USED TO ESTABLISH POSITIONAL TOLERANCE ON M4 MOUNTING HOLES.



Motor Length

Model	Length	Holes
SL06304	13.5 (5.33)	6
SL06306	177.5 (6.99)	8
SL06308	219.5 (8.64)	10
SL06310	261.5 (10.30)	12
SL06312	303.5 (11.95)	14





Magnet Length

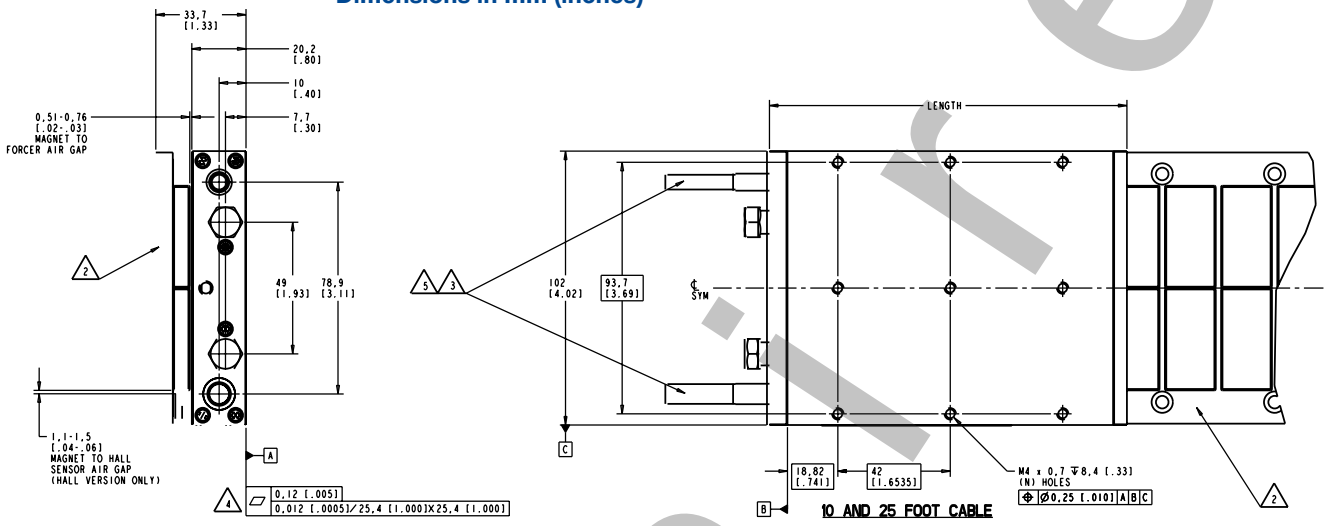
Model	Length	Holes
LB063042	42 (1.654)	2
LB063084	84 (3.307)	4
LB063210	210 (8.268)	10
LB063336	336 (13.228)	16
LB063462	462 (18.189)	22
LB063588	588 (23.150)	28

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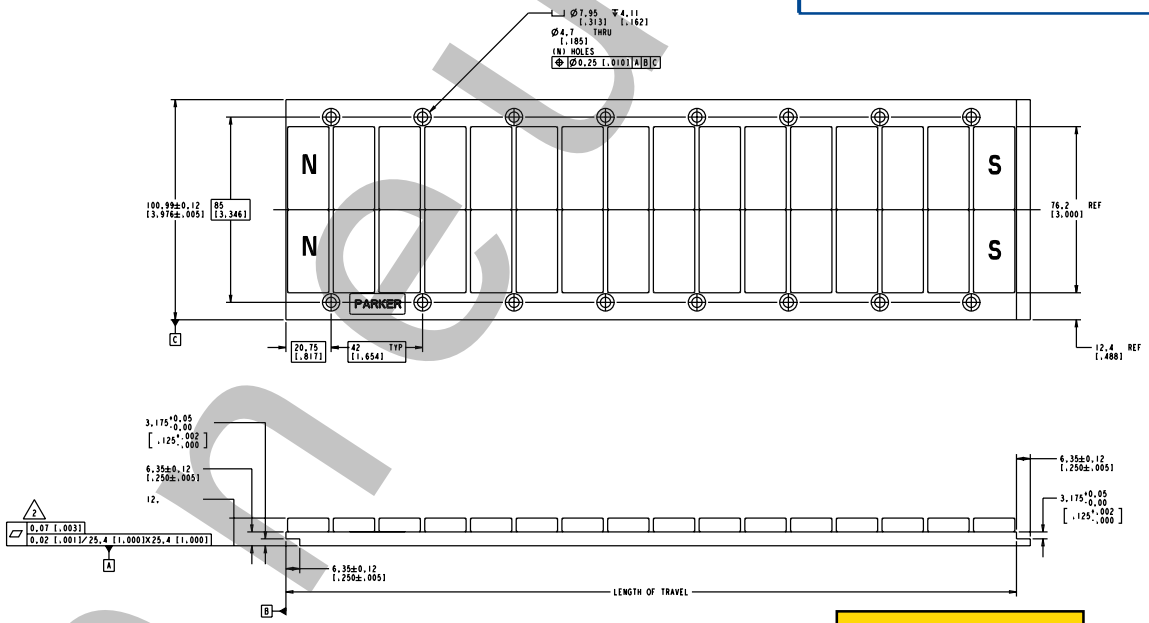
SL102 Dimensional Drawings

Dimensions in mm (inches)



Motor Length

Model	Length	Holes
SL10204	133.7 (5.26)	9
SL10206	175.5 (6.92)	12
SL10208	217.7 (8.57)	15
SL10210	259.7 (10.22)	18
SL10212	301.7 (11.88)	21



Magnet Length

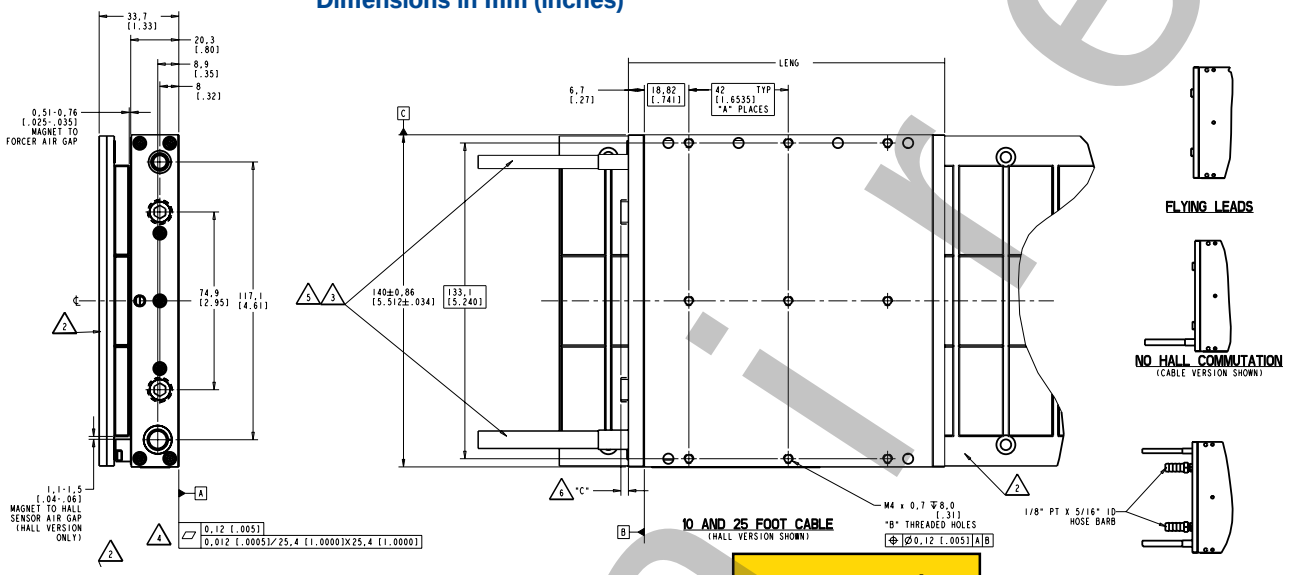
Model	Length	Holes
LB102042	42 (1.654)	2
LB102084	84 (3.307)	4
LB102210	210 (8.268)	10
LB102336	336 (13.228)	16
LB102462	462 (18.189)	22
LB102588	588 (23.150)	28

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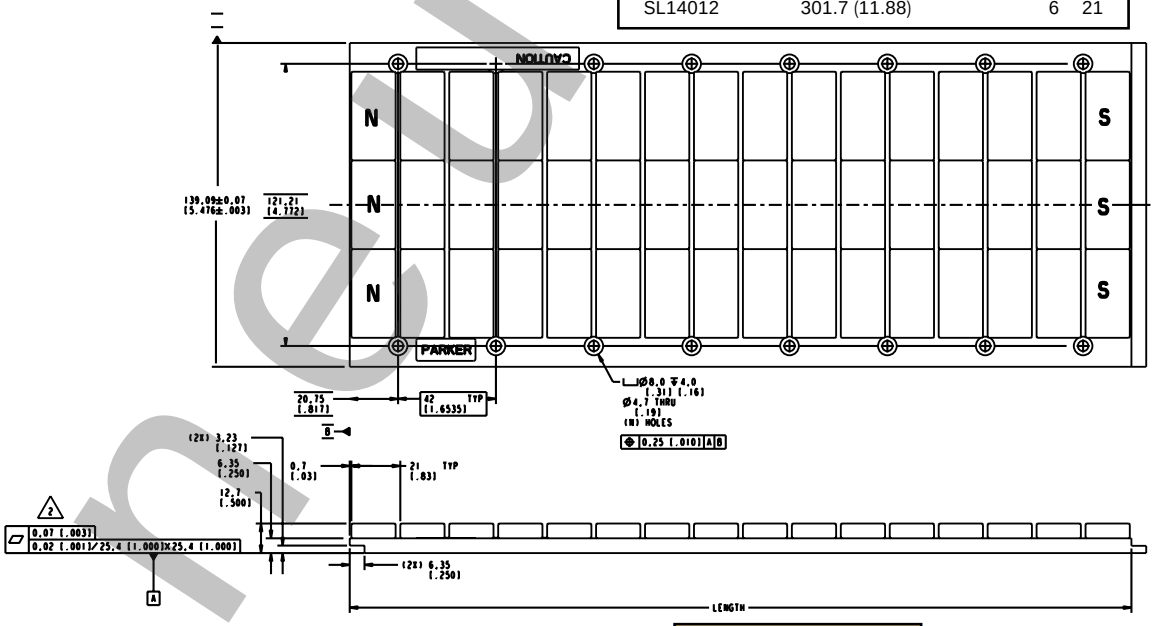
SL140 Dimensional Drawings

Dimensions in mm (inches)



Motor Length

Model	Length	Holes: A	B
SL14004	133.7 (5.26)	2	9
SL14006	175.7 (6.92)	3	12
SL14008	217.7 (8.57)	4	15
SL14010	259.7 (10.22)	5	18
SL14012	301.7 (11.88)	6	21



Magnet Length

Model	Length	Holes
LB140042	42 (1.654)	2
LB140084	84 (3.307)	4
LB140210	210 (8.268)	10
LB140336	336 (13.228)	16
LB140462	462 (18.189)	22
LB140588	588 (23.150)	28

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Integrated Design for Shortest Possible Package

Compumotor can provide an integrated planetary gearhead with the SM, SE, BE, NeoMetric Series or J Series brushless servo motors. By incorporating the pinion of the reducer into the motor's shaft design, Compumotor has achieved the shortest package length in the industry. This design eliminates the need for an adapter plate and coupling, resulting in a space savings of over two inches in total package length.

The integrated planetary gearheads are available in size 16, 23, 34 and 92mm. To simplify the application process, Compumotor provides a true system of specification for each motor gearhead combination.

Compumotor can also provide custom gearhead solutions. Custom ratios, mounting flanges, and shafts can easily be incorporated into our standard package.

Features

- Size 16, 23, 34 and 92mm
- Integrated design – Compact and short
- Shaft seal included with every gearhead
- Ratios:

GXX	RATIO	SM/SE (16, 23)	BE (23, 34)	Neo/J (34)	Neo/J (92)
G03	3:1	•	•	•	•
G05	5:1				•
G05	5.5:1	•	•	•	
G07	7:1	•	•	•	
G08	8:1				•
G10	10:1	•	•	•	•
G15	15:1				•
G22	22:1	•	•	•	
G25	25:1				•
G30	30:1				•
G40	40:1				•
G50	50:1				•
G55	55:1	•	•	•	
G100	100:1	•	•	•	

Part Numbering System

SM	233	A	E-	K	MS	G10
Series	*Frame, Magnet Length*	***Winding***	***Feedback***	***Shaft***	***Connection***	***Options***
SM SE BE J N	16X 23X 034X 092X	Identifying character A, B, D, E, F, etc.	D - 500 ppr encoder E - 1000 ppr encoder H - Hall-effect only J - 2000 ppr encoder R - Resolver	K - Keyway[1]	FL MS GS TQ PT 10 25	N - None B - Brake[2] G03 - 3:1 ratio[3] G05 - 5:1 ratio[3, 5] or 5.5:1[3, 4] G07 - 7:1 ratio[3, 4] G08 - 8:1 ratio[3] G10 - 10:1 ratio[3] G15 - 15:1 ratio[3, 5] G22 - 22:1 ratio[3, 4] G25 - 25:1 ratio[3, 5] G30 - 30:1 ratio[3, 5] G40 - 40:1 ratio[3, 5] G50 - 50:1 ratio[3, 5] G55 - 55:1 ratio[3, 4] G100 - 100:1 ratio[3, 4]

1 *Refers to keyway on gearhead output shaft*
2 *Currently available as standard product only on BE and Neometric motors*
3 *Shaft seal is included with the gearhead*
4 *Not available on Neometric 92mm*
5 *Neometric 92mm only*
6 *With MS, TQ or GS connectors - IP65*

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Size 16 Gearhead Mechanical Specifications

Parameter	Symbol	Units	G03	G05	G07	G10	G22	G55	G100
Ratio			3:1	5.5:1	7:1	10:1	22:1	55:1	100:1
Maximum Input Torque	T_r	lb-in oz-in Nm	39.0 624 4.37	21.4 343 2.40	16.4 263 1.84	9.9 158 1.11	8.5 136 0.95	3.1 49 0.34	1.2 19 0.13
Friction Torque	T_f	oz-in Nm	6.6 0.046	3.5 0.025	2.6 0.018	2.9 0.020	4.6 0.032	3.1 0.022	2.5 0.018
Viscous Damping	T_d	oz-in/Krpm Nm/Krpm	2.4 0.0168	1.2 0.0084	0.6 0.0042	0.4 0.0028	0.3 0.0021	0.3 0.0021	0.3 0.0021
Torque Efficiency	E		0.96	0.96	0.96	0.96	0.93	0.93	0.93
Torsional Stiffness		oz-in/arc-min Nm/arc-min	40 0.28	40 0.28	40 0.28	40 0.28	125 0.88	125 0.88	125 0.88
Gearhead Weight		lbs Kg	0.7 0.32	0.8 0.36	0.8 0.36	0.8 0.36	1.2 0.54	1.3 0.59	1.3 0.59
Backlash		arc-min	7	6	6	6	10	10	10

Note: These specifications are for gearheads which have been operated for less than one hour.

Gearhead Torque = (Motor Torque - T_f - (T_d x Motor Shaft Speed)) x Gear Ratio x E

Size 16 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque lb - in	Continuous Stall Torque Nm	Peak Stall Torque lb - in	Peak Stall Torque Nm	Gearhead Inertia lb-in-sec²	Gearhead Inertia Kg-m²	Thermal Resistance (°C/Watt)
SM160 SE160	G05	5.5:1	2.7	0.30	10.3	1.15	1.1 E-5	1.24 E-6	4.06
	G07	7:1	4.1	0.46	13.8	1.55	9.56 E-6	1.08 E-6	4.06
	G10	10:1	5.3	0.59	19.4	2.17	8.36 E-6	9.45 E-7	4.06
	G22	22:1	9.2	1.03	39.0	4.37	1.10 E-5	1.24 E-6	4.46
	G55	55:1	28.0	3.14	102.0	11.42	8.31 E-6	9.39 E-7	4.46
	G100	100:1	54.0	6.05	91.0	10.19	8.29 E-6	9.37 E-7	4.46
SM161 SE161	G03	3:1	3.1	0.35	11.2	1.25	3.25 E-5	3.67 E-6	3.41
	G05	5.5:1	6.5	0.73	21.5	2.41	1.10 E-5	1.24 E-6	3.41
	G07	7:1	9.0	1.01	27.8	3.11	9.56 E-6	1.08 E-6	3.41
	G10	10:1	12.5	1.40	40.0	4.48	8.36 E-6	9.45 E-7	3.41
	G22	22:1	24.0	2.69	84.0	9.41	1.10 E-5	1.24 E-6	3.63
	G55	55:1	65.0	7.28	143.0	16.02	8.31 E-6	9.39 E-7	3.63
	G100	100:1	91.0	10.19	91.0	10.19	8.29 E-6	9.37 E-7	3.63
SM162 SE162	G03	3:1	6.9	0.77	21.5	2.41	3.25 E-5	3.67 E-6	2.17
	G05	5.5:1	13.6	1.52	40 .6	4.55	1.10 E-5	1.24 E-6	2.17
	G07	7:1	17.3	1.94	52.0	5.82	9.56 E-6	1.08 E-6	2.17
	G10	10:1	24.8	2.78	74.0	8.29	8.36 E-6	9.45 E-7	2.17
	G22	22:1	49.0	5.49	158.0	17.70	1.10 E-5	1.24 E-6	2.66
	G55	55:1	126.0	14.11	143.0	16.02	8.31 E-6	9.39 E-7	2.66

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

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Size 23 Gearhead Mechanical Specifications

Parameter	Symbol	Units	G03	G05	G07	G10	G22	G55	G100
Ratio			3:1	5.5:1	7:1	10:1	22:1	55:1	100:1
Maximum Input Torque	T_r	lb-in	77.4	44.9	35.0	21.5	18.9	7.1	2.7
		oz-in	1238	718	560	344	303	114	43
		Nm	8.67	5.03	3.92	2.41	2.12	0.80	0.30
Friction Torque	T_f	oz-in	5.2	4.1	5.2	3.6	3.1	3.2	3.2
		Nm	0.036	0.029	0.036	0.025	0.022	0.022	0.022
Viscous Damping	T_d	oz-in/Krpm	5	1.2	1.1	0.7	2	1.2	0.8
		Nm/Krpm	0.035	0.0084	0.0077	0.0049	0.014	0.0084	0.0056
Torque Efficiency	E		0.96	0.96	0.96	0.96	0.93	0.93	0.93
Torsional Stiffness		oz-in/arc-min	67	67	67	67	250	250	250
		Nm/arc-min	0.47	0.47	0.47	0.47	1.75	1.75	1.75
Gearhead Weight		lbs	1.7	1.8	1.8	1.9	2.9	2.9	3.1
		Kg	0.77	0.82	0.82	0.86	1.32	1.32	1.41
Backlash		arc-min	6	6	6	6	10	10	10

Note: These specifications are for gearheads which have been operated for less than one hour.

Gearhead Torque = (Motor Torque - T_f - (T_d x Motor Shaft Speed)) x Gear Ratio x E

Size 23 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque		Peak Stall Torque		Gearhead Inertia		Thermal Resistance
			lb - in	Nm	lb - in	Nm	lb-in-sec²	Kg-m²	(°C/Watt)
SM230	G03	3:1	4.1	0.46	13.7	1.53	1.22 E-4	1.38 E-5	2.35
SE230	G05	5.5:1	7.8	0.87	25.3	2.83	2.65 E-5	2.99 E-6	2.35
	G07	7:1	9.7	1.09	31.8	3.56	1.93 E-5	2.18 E-6	2.35
	G10	10:1	15.0	1.68	46.5	5.2	11.35 E-5	1.53 E-6	2.35
	G22	22:1	31.0	3.47	100.0	11.20	2.70 E-5	3.05 E-6	2.61
	G55	55:1	77.0	8.62	250.0	28.00	1.34 E-5	1.51 E-6	2.61
	G100	100:1	140.0	15.68	244.0	27.33	1.33 E-5	1.50 E-6	2.61
SM231	G03	3:1	7.7	0.86	23.2	2.60	1.22 E-4	1.38 E-5	2.30
SE231	G05	5.5:1	14.2	1.59	42.6	4.77	2.65 E-5	2.99 E-6	2.30
	G07	7:1	18.1	2.03	54.2	6.07	1.93 E-5	2.18 E-6	2.30
	G10	10:1	25.8	2.89	77.5	8.68	1.35 E-5	1.53 E-6	2.30
	G22	22:1	53.0	5.94	167.0	18.70	2.70 E-5	3.05 E-6	2.48
	G55	55:1	132.0	14.78	371.0	41.55	1.34 E-5	1.51 E-6	2.48
	G100	100:1	241.0	26.99	244.0	27.33	1.33 E-5	1.50 E-6	2.48
SM232	G03	3:1	15.6	1.75	45.0	5.04	1.22 E-4	1.38 E-5	1.49
SE232	G05	5.5:1	30.2	3.38	82.5	9.24	2.65 E-5	2.99 E-6	1.49
	G07	7:1	37.0	4.14	106.0	11.87	1.93 E-5	2.18 E-6	1.49
	G10	10:1	53.1	5.95	150.0	16.80	1.35 E-5	1.53 E-6	1.49
	G22	22:1	110.0	12.32	338.0	37.86	2.70 E-5	3.05 E-6	1.79
	G55	55:1	275.0	30.80	371.0	41.55	1.34 E-5	1.51 E-6	1.79
SM233	G03	3:1	25.0	2.80	70.9	7.94	1.22 E-4	1.38 E-5	1.32
SE233	G05	5.5:1	45.3	5.07	129.9	14.55	2.65 E-5	2.99 E-6	1.32
	G07	7:1	56.2	6.29	165.4	18.52	1.93 E-5	2.18 E-6	1.32
	G10	10:1	84.3	9.44	234.4	26.25	1.35 E-5	1.53 E-6	1.32
	G22	22:1	169.0	18.93	401.0	44.91	2.70 E-5	3.05 E-6	1.35
	G55	55:1	371.0	41.55	371.0	41.55	1.34 E-5	1.51 E-6	1.35

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

Preview

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Size 23 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque		Peak Stall Torque		Gearhead Inertia		Thermal Resistance
			lb - in	Nm	lb - in	Nm	lb-in-sec²	Kg-m²	(°C/Watt)
BE230	G03	3:01	8.6	0.96	27.7	3.10	1.22 E-04	1.38 E-05	2.35
	G05	5.5:1	16.1	1.80	51.1	5.72	2.65 E-05	2.99 E-06	2.35
	G07	7:1	20.1	2.25	64.6	7.24	1.93 E-05	2.18 E-06	2.35
	G10	10:1	29.7	3.33	93.2	10.44	11.35 E-05	1.53 E-06	2.35
	G22	22:1	62.5	7.00	195.1	21.85	2.70 E-05	3.05 E-06	2.61
	G55	55:1	156.0	17.47	487.5	54.60	1.34 E-05	1.51 E-06	2.61
	G100	100:1	283.6	31.76	886.3	99.27	1.33 E-05	1.50 E-06	2.61
BE231	G03	3:1	16.2	1.81	50.5	5.66	1.22 E-04	1.38 E-05	2.3
	G05	5.5:1	30.1	3.37	93.0	10.42	2.65 E-05	2.99 E-06	2.3
	G07	7:1	37.9	4.24	117.9	13.20	1.93 E-05	2.18 E-06	2.3
	G10	10:1	55.0	6.16	169.3	18.96	1.35 E-05	1.53 E-06	2.3
	G22	22:1	115.5	12.94	354.1	39.66	2.70 E-05	3.05 E-06	2.48
	G55	55:1	288.4	32.30	885.0	99.12	1.34 E-05	1.51 E-06	2.48
BE232	G03	3:1	27.3	3.06	83.8	9.39	1.22 E-04	1.38 E-05	1.49
	G05	5.5:1	50.4	5.64	153.9	17.24	2.65 E-05	2.99 E-06	1.49
	G07	7:1	63.7	7.13	195.4	21.88	1.93 E-05	2.18 E-06	1.49
	G10	10:1	92.0	10.30	280.1	31.37	1.35 E-05	1.53 E-06	1.49
	G22	22:1	192.6	21.57	585.5	65.58	2.70 E-05	3.05 E-06	1.79
BE233	G03	3:1	36.1	4.04	110.1	12.33	1.22 E-04	1.38 E-05	1.32
	G05	5.5:1	66.5	7.45	202.2	22.65	2.65 E-05	2.99 E-06	1.32
	G07	7:1	84.2	9.43	256.9	28.77	1.93 E-05	2.18 E-06	1.32
	G10	10:1	121.2	13.57	368.0	41.22	1.35 E-05	1.53 E-06	1.32
	G22	22:1	253.7	28.41	768.8	86.11	2.70 E-05	3.05 E-06	1.35

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

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Size 34 Gearhead Mechanical Specifications

Parameter	Symbol	Units	G03	G05	G07	G10	G22	G55	G100
Ratio			3:1	5.5:1	7:1	10:1	22:1	55:1	100:1
Maximum Input Torque	T_r	lb-in	152.3	98.6	79.1	50.5	46.8	18.6	7.1
		oz-in	2437	1578	1266	808	749	297	114
		Nm	17.06	11.05	8.86	5.66	5.24	2.08	0.80
Friction Torque	T_f	oz-in	10	10	10	10	21	19	18
		Nm	0.070	0.070	0.070	0.070	0.147	0.133	0.126
Viscous Damping	T_d	oz-in/Krpm	2.5	2.0	1.5	1.3	1.5	0.3	0.1
		Nm/Krpm	0.0175	0.014	0.0105	0.0091	0.0105	0.0021	0.0007
Torque Efficiency	E		0.96	0.96	0.96	0.96	0.93	0.93	0.93
Torsional Stiffness		oz-in/arc-min	100	100	100	100	250	250	250
		Nm/arc-min	0.70	0.70	0.70	0.70	2.00	2.00	2.00
Gearhead Weight		lbs	4.3	4.6	4.6	4.8	7.4	7.6	7.7
		Kg	1.95	2.09	2.09	2.18	3.36	3.45	3.49
Backlash		arc-min	6	6	6	6	10	10	10

Note: These specifications are for gearheads which have been operated for less than one hour.

Gearhead Torque = (Motor Torque - T_f - (T_d x Motor Shaft Speed)) x Gear Ratio x E

Size 34 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque		Peak Stall Torque		Gearhead Inertia		Thermal Resistance
			lb - in	Nm	lb - in	Nm	lb-in-sec²	Kg-m²	(°C/Watt)
N0341 J0341	G03	3:1	14.7	1.65	45.6	5.11	6.77E-4	7.65E-5	1.49
	G05	5.5:1	26.2	2.93	83.7	9.37	1.51E-4	1.71E-5	1.49
	G07	7:1	33.8	3.79	106.2	11.89	1.11E-4	1.25E-5	1.49
	G10	10:1	46.9	5.25	150.0	16.80	7.90E-5	8.93E-6	1.49
	G22	22:1	89.0	9.97	317.0	35.50	1.55E-4	1.75E-5	1.68
	G55	55:1	228.0	25.54	800.0	89.60	7.94E-5	8.97E-6	1.68
	G100	100:1	421.0	47.15	542.0	60.70	7.87E-5	8.89E-6	1.68
N0342 J0342	G03	3:1	26.9	3.01	85.3	9.55	6.77E-4	7.65E-5	1.23
	G05	5.5:1	50.0	5.60	150.0	16.80	1.51E-4	1.71E-5	1.23
	G07	7:1	65.6	7.35	200.0	22.40	1.11E-4	1.25E-5	1.23
	G10	10:1	92.1	10.32	279.7	31.33	7.90E5	8.93E-6	1.23
	G22	22:1	184.0	20.61	609.0	68.21	1.55E-4	1.75E-5	1.39
	G55	55:1	467.0	52.30	860.0	96.32	7.94E-5	8.97E-6	1.39
	G100	100:1	542.0	60.70	542.0	60.70	7.87E-5	8.89E-6	1.39
N0343 J0343	G03	3:1	43.7	4.89	128.7	14.41	6.77E-4	7.65E-5	1.02
	G05	5.5:1	78.1	8.75	234.9	26.31	1.51E-4	1.71E-5	1.02
	G07	7:1	101.6	11.38	300.0	33.60	1.11E-4	1.25E5	1.02
	G10	10:1	145.6	16.31	431.2	48.29	7.90E-5	8.93E-6	1.02
	G22	22:1	295.0	33.04	902.0	101.02	1.55E-4	1.75E-5	1.15
	G55	55:1	744.0	83.33	860.0	96.32	7.94E-5	8.97E-6	1.15
N0344 J0344	G03	3:1	50.3	5.63	162.5	18.20	6.77E-4	7.65E-5	0.89
	G05	5.5:1	100.0	11.20	297.4	33.31	1.51E-4	1.71E-5	0.89
	G07	7:1	125.0	14.00	375.0	42.00	1.11E-4	1.25E-5	0.89
	G10	10:1	181.2	20.29	543.7	60.89	7.90E-5	8.93E-6	0.89
	G22	22:1	307.0	41.44	902.0	101.02	1.55E-4	1.75E-5	0.96
	G55	55:1	860.0	96.32	860.0	96.32	7.94E-5	8.97E-6	0.96

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

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Size 34 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque lb - in	Continuous Stall Torque Nm	Peak Stall Torque lb - in	Peak Stall Torque Nm	Gearhead Inertia lb-in-sec²	Gearhead Inertia Kg-m²	Thermal Resistance (°C/Watt)
BE341	G03	3:01	41.7	4.67	129.1	14.46	6.77E-04	7.65E-05	1.49
	G05	5.5:1	76.2	8.57	236.7	26.51	1.51E-04	1.71E-05	1.49
	G07	7:1	97.3	10.90	301.3	33.75	1.11E-04	1.25E-05	1.49
	G10	10:1	139.0	15.57	430.4	48.20	7.90E-05	8.93E-06	1.49
	G22	22:1	276.6	30.98	884.9	99.11	1.55E-04	1.75E-05	1.68
	G55	55:1	697.7	78.14	2218.4	248.46	7.94E-05	8.97E-06	1.68
BE342	G03	3:1	76.6	8.58	233.5	26.15	6.77E-04	7.65E-05	1.23
	G05	5.5:1	140.5	15.74	428.1	47.95	1.51E-04	1.71E-05	1.23
	G07	7:1	178.8	20.03	544.8	61.02	1.11E-04	1.25E-05	1.23
	G10	10:1	255.5	28.62	778.3	87.17	7.90E05	8.93E-06	1.23
	G22	22:1	519.7	58.21	1611.3	180.47	1.55E-04	1.75E-05	1.39
	G55	55:1	1305.5	146.22	4034.4	451.85	7.94E-05	8.97E-06	1.39
BE343	G03	3:1	105.2	11.78	319.0	35.73	6.77E-04	7.65E-05	1.02
	G05	5.5:1	192.8	21.59	584.9	65.51	1.51E-04	1.71E-05	1.02
	G07	7:1	245.4	27.48	744.4	83.37	1.11E-04	1.25E-05	1.02
	G10	10:1	350.5	39.26	1063.5	119.11	7.90E-05	8.93E-06	1.02
	G22	22:1	718.2	80.44	2206.6	247.14	1.55E-04	1.75E-05	1.15
BE344	G03	3:1	131.7	14.75	398.6	44.64	6.77E-04	7.65E-05	0.89
	G05	5.5:1	241.4	27.04	730.8	81.85	1.51E-04	1.71E-05	0.89
	G07	7:1	307.3	34.42	930.1	104.17	1.11E-04	1.25E-05	0.89
	G10	10:1	438.9	49.16	1328.7	148.81	7.90E-05	8.93E-06	0.89
	G22	22:1	902.8	101.11	2760.4	309.16	1.55E-04	1.75E-05	0.96

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

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Size 92 Gearhead Mechanical Specifications

Parameter	Symbol	Units	G03	G05	G08	G10	G15	G25	G30	G40	G50
Ratio			3:1	5:1	8:01	10:1	15:1	25:1	30:1	40:1	50:1
Max. Input Torque	T_r	lb-in oz-in Nm	301 4816 33.7	199 3184 22.3	81 1296 9.0	42 672 4.7	66 1056 7.4	40 640 4.5	30 480 3.36	25 400 2.8	20 320 2.2
Friction Torque	T_f	oz-in Nm	23 .161	15.5 .109	12 .084	15 .105	24 .168	17 .119	23.5 .165	16 .112	19 .133
Viscous Damping	T_d	oz-in/Krpm Nm/Krpm	2	1.6	1.8	0.7	3.2	1.7	2.4	1.8	0.7
Torque Efficiency	E		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Torsional Stiffness		oz-in/arc-min Nm/arc-min	70.5 .49	70.5 .49	70.5 .49	70.5 .49	70.5 .49	70.5 .49	70.5 .49	70.5 .49	70.5 .49
Gearhead Weight		lbs Kg	3.1 1.4	3.1 1.4	3.1 1.4	3.1 1.4	3.9 1.8	3.9 1.8	3.9 1.8	3.9 1.8	3.9 1.8
Backlash		arc-min	10	10	10	10	12	12	12	12	12

Note: These specifications are for gearheads which have been operated for less than one hour.

Gearhead Torque = (Motor Torque - T_f - (B x Motor Shaft Speed)) x Gear Ratio x E

Size 92 Motor/Gearhead System Specifications

Motor Frame	Planetary Identifier	Ratio	Continuous Stall Torque		Peak Stall Torque		Gearhead Inertia		Thermal Resistance
			lb - in	Nm	lb - in	Nm	lb-in-sec²	Kg-m²	(°C/Watt)
N0921	G03	3:1	38.5	4.31	123.3	13.81	7.35E-04	8.30E-05	1.00
	G05	5:1	66.2	7.41	207.6	23.25	4.78E-04	5.40E-05	1.00
	G08	8:1	107.6	12.05	333.7	37.37	4.16E-04	4.70E-05	1.00
	G10	10:1	132.8	14.87	415.4	46.52	3.98E-04	4.50E-05	1.00
	G15	15:1	191.5	21.45	615.5	68.94	6.90E-04	7.80E-05	0.85
	G25	25:1	329.1	36.86	1035.7	116.00	4.43E-04	5.00E-05	0.85
	G30	30:1	383.8	42.99	1231.8	137.96	4.25E-04	4.80E-05	0.85
	G40	40:1	528.8	59.23	1659.5	185.86	4.16E-04	4.70E-05	0.85
	G50	50:1	652.5	73.08	2065.8	231.37	4.43E-04	5.00E-05	0.85
N0922	G03	3:1	71:3	7.99	221.7	24.83	7.35E-04	8.30E-05	0.85
	G05	5:1	121.0	13.55	371.7	41.63	4.78E-04	5.40E-05	0.85
	G08	8:1	195.1	21.85	596.3	66.79	4.16E-04	4.70E-05	0.85
	G10	10:1	242.2	27.13	743.7	83.29	3.98E-04	4.50E-05	0.85
	G15	15:1	355.6	39.83	1107.8	124.07	6.90E-04	7.80E-05	0.75
	G25	25:1	602.6	67.49	1856.4	207.92	4.43E-04	5.00E-05	0.75
	G30	30:1	712.1	79.76	2216.5	248.25	4.25E-04	4.80E-05	0.75
N0923	G03	3:1	108.5	12.15	333.3	37.33	7.35E-04	8.30E-05	0.68
	G05	5:1	183.0	20.50	557.7	62.46	4.78E-04	5.40E-05	0.68
	G08	8:1	294.3	32.96	893.9	100.12	4.16E-04	4.70E-05	0.68
	G10	10:1	366.2	41.01	1115.7	124.96	3.98E-04	4.50E-05	0.68
	G15	15:1	541.6	60.66	1665.9	186.58	6.90E-04	7.80E-05	0.59
N0924	G03	3:1	143.8	16.11	439.2	49.19	7.35E-04	8.30E-05	0.53
	G05	5:1	241.8	27.08	734.1	82.22	4.78E-04	5.40E-05	0.53
	G08	8:1	388.4	43.50	1176.2	131.73	4.16E-04	4.70E-05	0.53
	G15	15:1	718	80.42	2195.2	245.86	6.90E-04	7.80E-05	0.52

Torque limited by gearhead design. Motor must not exceed listed maximum input torque.

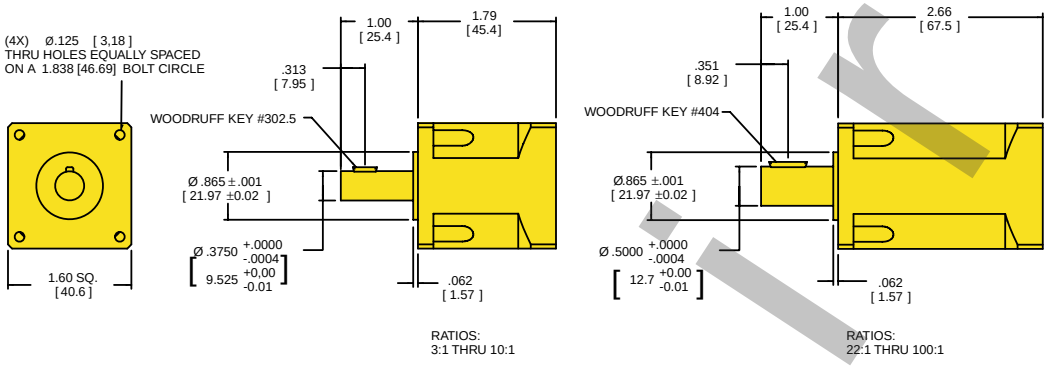
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Planetary Gearheads Dimensional Drawings

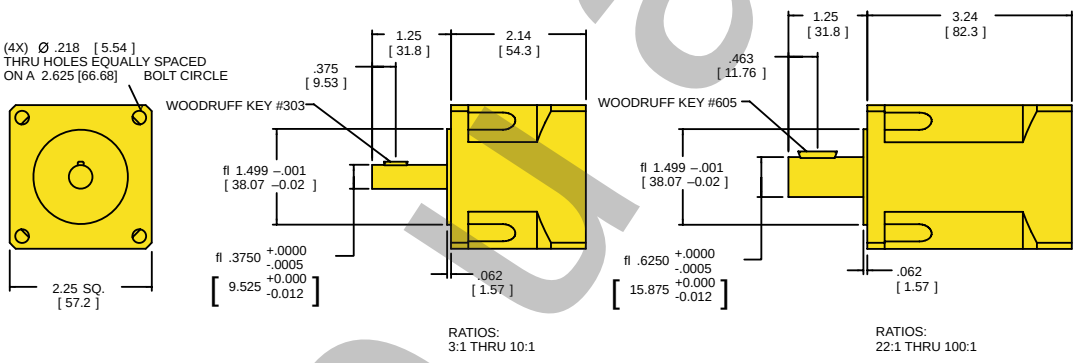
Size 16, Dimensional Drawing

Dimensions in inches (mm)



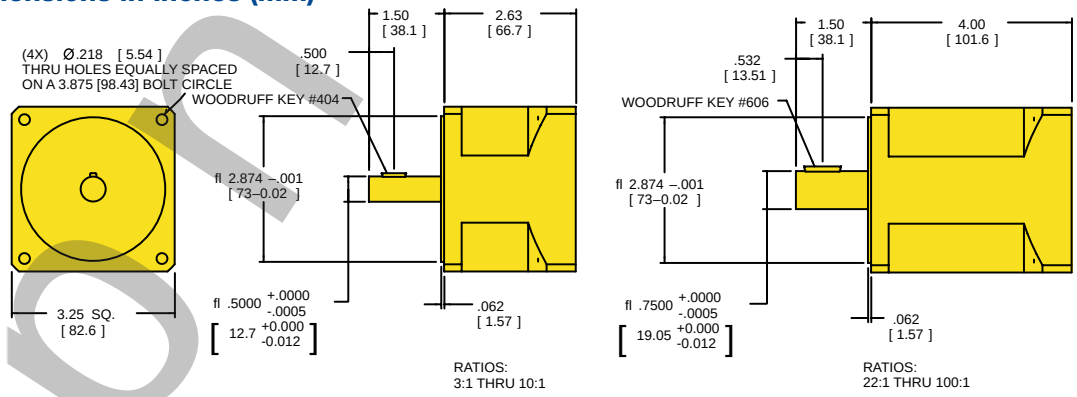
Size 23, Dimensional Drawing

Dimensions in inches (mm)



Size 34, Dimensional Drawing

Dimensions in inches (mm)



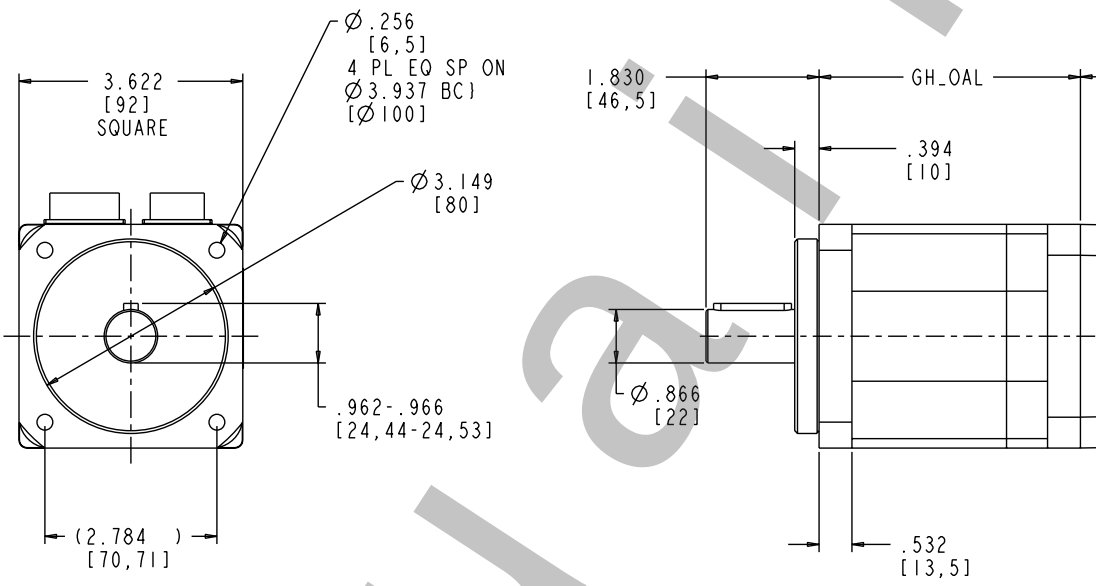
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Planetary Gearheads Dimensional Drawings, continued

Size 92, Dimensional Drawing

Dimensions in inches (mm)



RATIOS	GH_OAL
3, 5, 8, 10:1	2.330
15, 25, 30, 40, 50:1	4.230

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Motor Cable Table

Motor Family	Motor	Amplifier*	Cable Set (Consists of 1 Motor Cable and 1 Feedback Cable)	Motor Cable	Motor Cable Includes **	Feedback Cable	Feed-back Cable Includes **	Length -XX
SM								
16	SM16XXE-NGSN	Gemini -L3E	23GS CABLE-XX	71-018303-XX	m	71-018308-XX	e,h,t	2
	SM16XXE-NMSN	miscellaneous	23MS CABLE-XX	71-014675-XX	m,t	71-015871-XX	e,h	2
23	SM23XXE-NGSN	Gemini -L3E	23GS CABLE-XX	71-018303-XX	m	71-018308-XX	e,h,t	2
	SM23XXE-NGSB	Gemini -L3E	23GB CABLE-XX	71-018303-XX	m	71-018309-XX	e,h,t,b	2
	SM23XXR-NGSN	Gemini -L3R	23GR CABLE-XX	71-018303-XX	m	71-018307-XX	r,t	3
	SM23XXR-NGSB	Gemini -L3R	23GR CABLE-XX	71-018303-XX	m	71-018307-XX	r,t,b	3
	SM23XXE-NMSN	miscellaneous	23MS CABLE-XX	71-014675-XX	m,t	71-015871-XX	e,h	2
	SM23XXE-NMSB	miscellaneous	23MS CABLE-XX	71-014675-XX	m,t	71-015871-XX	e,h,b	2
	SM23XXR-NMSN	miscellaneous	23RS CABLE-XX	71-014675-XX	m	71-015870-XX	r,t	3
	SM23XXR-NMSB	miscellaneous	23RS CABLE-XX	71-014675-XX	m	71-015870-XX	r,t,b	3
	SM23XXE-NTQN	OEM770	23TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e	2
	SM23XXE-NTQB	OEM770	23TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e,b	2
	SM23XXR-NMSN	Compax1000SL	23CX CABLE-XX	71-015531-XX	m	71-020104-XX	r,t	2
BE								
16	BE16XXE-NMSN	Gemini -U3E	BE-GS CABLE-XX	71-018304-XX	m	71-018308-XX	e,h***	2
	BE16XXE-NMSN	miscellaneous	BE-MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h***	2
	BE16XXE-NTQN	OEM770	BE-TQ CABLE-XX	71-015017-XX	m,h***	71-015886-XX	e	2
23	BE23XXE-NMSN	Gemini -UXXE	BE-GS CABLE-XX	71-018304-XX	m	71-018308-XX	e,h,t	2
	BE23XXE-NMSB	Gemini -UXXE	BE-GB CABLE-XX	71-018304-XX	m	71-018309-XX	e,h,t,b	2
	BE23XXR-NMSN	Gemini -UXXR	BE-GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t	3
	BE23XXR-NMSB	Gemini -UXXR	BE-GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t,b	3
	BE23XXE-NMSN	miscellaneous	BE-MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t	2
	BE23XXE-NMSB	miscellaneous	BE-MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t,b	2
	BE23XXR-NMSN	SLVD5	BE-RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t	3
	BE23XXR-NMSB	SLVD5	BE-RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t,b	3
	BE23XXR-NMSN	Compax1000SL	23CX CABLE-XX	71-015531-XX	m	71-020104-XX	r,t	2
	BE23XXE-NTQN	OEM770	BE-TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e	2
	BE23XXE-NTQB	OEM770	BE-TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e,b	2
34	BE34XXE-NMSN	Gemini -UXXE	BE-GS CABLE-XX	71-018304-XX	m	71-018308-XX	e,h,t	2
	BE34XXE-NMSB	Gemini -UXXE	BE-GB CABLE-XX	71-018304-XX	m	71-018309-XX	e,h,t,b	2
	BE34XXR-NMSN	Gemini -UXXR	BE-GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t	3
	BE34XXR-NMSB	Gemini -UXXR	BE-GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t,b	3
	BE34XXE-NMSN	miscellaneous	BE-MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t	2
	BE34XXE-NMSB	miscellaneous	BE-MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t,b	2
	BE34XXR-NMSN	SLVD5	BE-RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t	3
	BE34XXR-NMSB	SLVD5	BE-RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t,b	3
	BE34XXR-NMSN	Compax2500S	34CX CABLE-XX	71-015531-XX	m	71-020104-XX	r,t	2

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Motor Cable Table, continued

Motor Family	Motor	Amplifier*	Cable Set (Consists of 1 Motor Cable and 1 Feedback Cable)	Motor Cable	Motor Cable Includes **	Feedback Cable	Feed-back Cable Includes **	Length -XX
NEO & J								
70/34	N/J070XXE-NGSN	Gemini -UXXE	70GS CABLE-XX	71-018304-XX	m	71-018308-XX	e,h,t	2
	N/J070XXE-NGSB	Gemini -UXXE	70GB CABLE-XX	71-018304-XX	m	71-018309-XX	e,h,t,b	2
	N/J070XXR-NGSN	Gemini -UXXR	70GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t	3
	N/J070XXR-NGSB	Gemini -UXXR	70GR CABLE-XX	71-018304-XX	m	71-018307-XX	r,t,b	3
	N/J070XXE-NMSN	miscellaneous	70MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t	2
	N/J070XXE-NMSB	miscellaneous	70MS CABLE-XX	71-015531-XX	m	71-015871-XX	e,h,t,b	2
	N/J070XXR-NMSN	SLVD5	70RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t	3
	N/J070XXR-NMSB	SLVD5	70RS CABLE-XX	71-015531-XX	m	71-015870-XX	r,t,b	3
	N/J070XXR-NMSN	Compax2500S	70CX CABLE-XX	71-015531-XX	m	71-020104-XX	r,t	2
	N/J070XXE-NTQN	OEM770	70TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e	2
	N/J070XXE-NTQB	OEM770	70TQ CABLE-XX	71-015017-XX	m,t,h	71-015886-XX	e,b	2
92	N/J092XXE-NGSN	Gemini -UXXE	92GS CABLE-XX	71-018305-XX	m	71-018308-XX	e,h,t	2
	N/J092XXE-NGSB	Gemini -UXXE	92GB CABLE-XX	71-018305-XX	m	71-018309-XX	e,h,t,b	2
	N/J092XXR-NGSN	Gemini -UXXR	92GR CABLE-XX	71-018305-XX	m	71-018307-XX	r,t	3
	N/J092XXR-NGSB	Gemini -UXXR	92GR CABLE-XX	71-018305-XX	m	71-018307-XX	r,t,b	3
	N/J092XXE-NMSN	miscellaneous	92MS CABLE-XX	71-015532-XX	m	71-015871-XX	e,h,t	2
	N/J092XXE-NMSB	miscellaneous	92MS CABLE-XX	71-015532-XX	m	71-015871-XX	e,h,t,b	2
	N/J092XXR-NMSN	miscellaneous	92RS CABLE-XX	71-015532-XX	m	71-015870-XX	r,t	3
	N/J092XXR-NMSB	miscellaneous	92RS CABLE-XX	71-015532-XX	m	71-015870-XX	r,t,b	3
	N/J092XXR-NMSN	Compax2500S	92CX CABLE-XX	71-015532-XX	m	71-020104-XX	r,t	2

M					****			
105	M105XXJ-KMSN	Gemini -HXXE	105GS CABLE-XX	71-020105-XX	m	71-020117-XX	e,h,t	1
	M105XXR-KMSN	Gemini -HXXR	105GR CABLE-XX	71-020105-XX	m	71-020621-XX	r,t	1
	M105XXR-KMSN	HPD	105RS CABLE-XX	71-020105-XX	m	71-020645-XX	r,t	1
	M105XXR-KMSN	Compax1500M	105CX CABLE-XX	Contact Factory	m	Contact Factory	r,t	1
145	M145XXJ-KMSN	Gemini -HXXE	145GS CABLE-XX	71-020114-XX	m	71-020117-XX	e,h,t	1
	M145XXR-KMSN	Gemini -HXXR	145GR CABLE-XX	71-020114-XX	m	71-020621-XX	r,t	1
	M145XXR-KMSN	HPD	145RS CABLE-XX	71-020114-XX	m	71-020645-XX	r,t	1
	M145XXR-KMSN	Compax3500M	145CX CABLE-XX	Contact Factory	m	Contact Factory	r,t	1
205	M205XXJ-KMSN	Gemini -HXXE	205GS CABLE-XX	71-020116-XX	m	71-020117-XX	e,h,t	1
	M205XXR-KMSN	Gemini -HXXR	205GR CABLE-XX	71-020116-XX	m	71-020621-XX	r,t	1
	M205XXR-KPTN	Gemini -HXXR	205GRP CABLE-XX	71-020622-XX	m	71-020623-XX	r,t	1
	M205XXR-KMSN	HPD	205RS CABLE-XX	71-020116-XX	m	71-020645-XX	r,t	1
	M205XXR-KPTN	HPD	205RP CABLE-XX	71-020622-XX	m	71-020646-XX	r,t	1
	M205XXR-KMSN	Compax3500M	205CX CABLE-XX	Contact Factory	m	Contact Factory	r,t	1

Key	
m	motor phase wires
t	temperature switch
e	encoder signals
h	hall effect signals
r	resolver signals
b	brake wires

Notes
* Refer to applicable amplifier section of the catalog for specific motor/amplifier compatibility
** Only the signals used by the motor are shown, cable may contain additional unused signal wires
*** Size 16 BE motors do not contain temperature switches
**** All M series motor cables include brake wires
1 Cables and Cable Sets in this row are available in -10 & -25 foot lengths
2 Cables and Cable Sets in this row are available in -10, -25, & -35 foot lengths
3 Cables and Cable Sets in this row are available in -10, -25, -35 & -50 foot lengths
For Hi-Flex cables see motor cable table at www.compumotor.com

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