

# **GLENTEK INC.**



## **Servo & Spindle Drives**



## **Servo Motors**

## Introduction

Welcome to Glentek! Glentek has been designing and manufacturing high performance servo drives and servo motors since 1964. Our products are always on the cutting edge of technology and incorporate the latest generation of DSP & micro-processor control, high-efficiency/performance control algorithms, magnetic technology, and special heat transfer techniques. By incorporating these technologies into our designs, it enables us to provide ultra high performance, unsurpassed reliability and one of the highest power density products in the world.

Servo drives are offered in both PWM (Pulse Width Modulated) and Linear and can drive brush type, brushless, rotary, linear, voice coil and AC induction motors. Rotary servo motors are offered in both brush type and brushless with industry standard mounting, lead termination and feedback options.

Although Glentek has a wide product offering, we also specialize in custom servo drive and servo motor designs for OEM's. Often times your unique system requirements can be achieved with a simple electrical, mechanical, or software modification which leads to an extremely short development cycle.

Our modern factory is located in El Segundo, California and houses our administrative, engineering, manufacturing, sales, test, and research facilities. Unlike many other servo drive manufacturers, the large majority of our products are produced in-house (i.e. no third party manufacturers) which enable us to offer one of the most cost effective and best overall value products in the world. Additionally, all products undergo 100% testing prior to shipping from our factory. Glentek is a registered ISO9001:2015 company, which is an assurance to our customers that Glentek is 100% committed to producing quality products with unsurpassed service.

## Mission Statement

Glentek designs and manufactures motor control electronics and motors—both standard and custom—for the world wide motion control market place.

We partner with original equipment manufacturers and provide superior value by delivering quality products on time with unsurpassed service.

We consider the customer the most important person in our business.

Our commitment is to ensure outstanding financial performance and long lasting relationships benefiting customers, employees, shareholders and suppliers, now and into the future.

## Vision Statement

To be recognized as a premier supplier of motor control electronics and motors for the world wide motion control market place.

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# PWM SERVO DRIVES OVERVIEW

## Gamma Series Digital PWM Servo Drives

Glentek's Gamma Series Digital PWM Servo Drives represents Glentek's latest offering of higher performance multi-core DSP control of brushless (standard servo and high-speed spindle), brush type, rotary, linear, voice coil, and AC induction motors. Two versions of the drive are offered, 9G16 and 9GE. Refer to the selection table on [pg. 6](#) for more details. They offer expanded command and control modes including CANopen, EtherCAT (9GE models only) and indexing/point-to-point. For EtherCAT, the drive device profile is based on IEC 61800-7-201 (CiA 402). The minimum sync cycle time is 125  $\mu$ s (8 kHz). A UL Recognized Component option is available for 9G16 models. The drives also accept feedback from a wider range of devices and protocols, namely absolute serial encoders (Biss, EnDat and T-Format), and analog Sin/Cos encoders. Additional programmable I/O includes 5 optically isolated inputs, 6 Schmitt triggers, 2 differential inputs, 3 MOSFET outputs, 2 optically isolated programmable outputs, and a general purpose relay. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. These drives incorporate Field Oriented Control (FOC) and Space Vector Modulation (SVM) algorithms which provide optimum control that enable motors to run cooler and at higher velocities. Set-up, tuning, and system diagnostics are accomplished using MotionMaestro (Glentek's Windows-based software).

## Alpha Series Digital PWM Servo Drives

Glentek's Alpha Series Digital PWM Servo Drives offer high performance DSP control of brushless (standard servo and high-speed spindle), brush type, rotary, linear, voice coil and AC induction motors. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. These drives incorporate Field Oriented Control (FOC) and Space Vector Modulation (SVM) algorithms which provide optimum control that enable motors to run cooler and at higher velocities. Set-up, tuning and system diagnostics is accomplished using MotionMaestro (Glentek's Windows-based software).

## Analog Brush Series PWM Servo Drives

Glentek's Analog Brush PWM Servo Drives offer high performance analog control of brush type rotary and voice coil motors. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. Glentek has been designing and producing analog brush PWM servo drives for over 40 years and continually updates each product as advances in technology become available so that customers are assured of optimal performance and reliability. These drives offer a cost effective, simple (tuning is accomplished by the adjustment of potentiometers), and high performance solution.



# PWM SERVO DRIVE COMPARISON

Command/Control Modes	Gamma Series Digital PWM Servo Drives	Alpha Series Digital PWM Servo Drives	Analog Brush Series PWM Servo Drives
+/-10 VDC for current (torque) or velocity (RPM)	•	•	•
Pulse (step) and direction	•	•	
Encoder follower	•	•	
CW/CCW (up/down mode)	•		
External sine commutation (2-phase current mode)	•	•	
RS-232	•	•	
RS-485	•		
PWM for current (torque) or velocity (RPM)	•	•	
Camming/Gearing	•	•	
Indexer/Point-to-Point	•		
CANopen	•		
EtherCAT (9GE only)	•		
<b>Feedback</b>			
Incremental (TTL) quadrature encoder	•	•	
Digital Hall sensors or commutation tracks from encoder	•	•	
Resolver	•	•	
Analog tachometer	•	•	•
Absolute serial encoder (Biss, EnDat, and T-Format)	•		
Analog Sin/Cos encoder	•		
Two feedback devices <sup>(1)</sup>	•		
<b>I/O</b>			
Dedicated I/O: Analog signal command, tachometer, +/- limits, inhibit/enable, fault, reset, motor temperature	•	•	•
Encoder and step & direction	•	•	
Dedicated Output: Motor current, low-speed electronic circuit breaker, high-speed electronic circuit breaker, over-voltage, and over-temperature			•
Programmable analog out	•	•	
General purpose relay	•	•	
Programmable digital inputs: 5 optically isolated inputs, 6 Schmitt triggers, 2 differential inputs	•		
Programmable digital outputs: 3 MOSFET outputs, 2 optically isolated outputs	•		
Brake: maximum 2 amps @ 24VDC	•		
Master/slave	•	•	•
<b>Safety Disable</b>			
Safe Torque Off (STO) in accordance with IEC61800-5-2 (optional)	•		
<b>Regulatory</b>			
UL Recognized Component for the US and Canada (9G16 only)	•		

Note: <sup>(1)</sup> We can accept any of the devices above and an additional incremental encoder.

# GAMMA SERIES DIGITAL PWM SERVO DRIVES

Glentek's Gamma Series Digital PWM Servo Drives represents Glentek's latest offering of higher performance multi-core DSP control of brushless (standard servo and high-speed spindle), brush type, rotary, linear, voice coil, and AC induction motors. They offer expanded command and control modes, accept feedback from a wide range of devices and protocols, and include a programmable I/O. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. These drives incorporate Field Oriented Control (FOC) and Space Vector Modulation (SVM) algorithms which provide optimum control that enable motors to run cooler and at higher velocities. Set-up, tuning, and system diagnostics are accomplished using MotionMaestro (Glentek's Windows-based software). There are two versions of this drive available, SMx9G16 models and SMx9GExx models (x's are model number placeholders). Refer to the selection table below to select the version that best suits your application.

Model	9G16	9GE15	9GE30	9GE45	9GE75
<b>Input Voltage (VDC)</b>	24-710	24-565	-	-	-
<b>Input Voltage (VAC)</b>	110-500	110-400	110-240	110-240	110-240
<b>Cont. Output Current (A)</b>	5, 10, 15, 20, 25, 30, or 45	5, 10, 15, 20, 25, 30, or 45	30	45	75
<b>Current Loop Bandwidth (kHz)</b>	5	5	3 <sup>(1)</sup>	3 <sup>(1)</sup>	3 <sup>(1)</sup>
<b>CANopen</b>	•	•	•	•	•
<b>EtherCAT (125 <math>\mu</math>s / 8 kHz minimum sync cycle time)</b>		•	•	•	•
<b>Safe Torque Off (STO) UL <sup>(3)</sup></b>	•	•	• <sup>(2)</sup>	• <sup>(2)</sup>	• <sup>(2)</sup>

## Note:

<sup>(1)</sup> Higher current loop bandwidths may be available depending on the application.

<sup>(2)</sup> Safe Torque Off (STO) is available as an option for the indicated drives by special request only, and will have longer than normal lead times.

<sup>(3)</sup> The UL Recognized Component option is not available for every drive. Refer to the electrical ratings table for more details.

Command/Control Modes
+/-10 VDC for current (torque) or velocity (RPM)
Pulse (step) and direction
Encoder follower
CW/CCW (up/down mode)
External sine commutation (2-phase current mode)
RS-232 & RS-485
PWM for current (torque) or velocity (RPM) in 50% duty cycle format (one-wire) or 100% duty cycle format (two-wire)
Indexer/Point-to-Point
Camming/Gearing
CANopen
EtherCAT (SMx9GE models only) (125 $\mu$ s / 8 kHz minimum sync cycle time)
Feedback
Incremental (TTL) quadrature encoder
Digital Hall sensors or commutation tracks from encoder
Absolute serial encoder (BiSS, EnDat, and T-Format)
Analog Sin/Cos encoder
Resolver
Analog tachometer
Two feedback devices: Any of the devices above and an additional incremental (TTL) quadrature encoder

I/O
Dedicated digital inputs: 2 STO optically isolated
Dedicated digital output: Brake (max 2 A @ 24 VDC)
Programmable digital inputs: 5 optically isolated, 6 Schmitt trigger, 2 differential
Programmable digital outputs: 3 MOSFETS (max 1.5A, 24 VDC), 2 optically isolated (max 10 mA, 24 VDC), relay (max 2 A, 30 VDC)
Analog Inputs: 2 differential (16 bit A/D)
Analog Outputs: 2 single ended, programmable (12 bit A/D)
Safety Disable
Safe Torque Off (STO) in accordance with IEC61800-5-2 (available upon request only)
Environmental Conditions
Storage Temperature: -40°C to 80°C
Ambient Operating Temperature: For operating temperature and deratings, see the electrical ratings table
Humidity: 5% to 95% relative humidity, non-condensing
Altitude: Up to 1000m without derating, derate current 10% per 1000m above 1000m

<b>Performance</b>	
<b>FOC</b>	All Gamma Series employ Field Oriented Control method which allows accurate control in both steady state or transient operation, and optimal orientation of the magnetic field.
<b>Space Vector Modulation</b>	Glentek's advanced algorithms allow for maximum utilization of the DC bus voltage while generating minimum harmonic distortion of the currents in the winding of 3-phase AC motor.
<b>Digital current loops</b>	Current loop bandwidths up to 5 kHz.
<b>Digitally tuned Parametric filtering</b>	All parameters set digitally. No potentiometers to adjust. DSP control for the ultimate in high performance. Provides control engineers advanced filtering to eliminate unwanted system mechanical resonance.
<b>Smart-Comm Initialization</b>	Eliminates the need for Hall sensor or commutation tracks for many applications.
<b>Auto Phase Finding</b>	Plug and Play for all types of three phase brushless motors. The drives algorithm will automatically find and align the motor phases.
<b>Auto Phase Advance</b>	Glentek's advanced algorithms incorporated in the Gamma Series drives, automatically provide phase advance, insuring that the current is delivered at the appropriate time, and provides the most efficient operation.
<b>Sinusoidal commutation</b>	For the ultimate in efficiency and smooth motion. Commutates from almost any resolution linear or rotary encoder or Hall sensors only.
<b>Fault protection</b>	Short from output to output, short from output to ground, drive RMS over current, drive under/over voltage, drive over temperature, motor over temperature.
<b>On-the-fly mode switching</b>	This feature allows the drive to switch between any mode of operation on-the-fly.
<b>Software configurable</b>	Glentek's Windows™ based MotionMaestro© software provides ease of set-up, monitoring and tuning with no previous programming experience required. Windows™ 95/98/2000/XP, NT, Vista, 7, 8, and 10 compatible.
<b>Silent operation</b>	25 kHz PWM standard.
<b>Command/control Modes</b>	+/-10 V for current (torque) or velocity (RPM), pulse (step) and direction, encoder follower, external sine commutation (2-phase current mode), RS-232, RS-485, CANopen, EtherCAT (SMx9GE only), PWM for current (torque) or velocity (RPM), camming/gearing, Indexer/Point-to-Point.
<b>Regulatory</b>	
<b>UL Recognized</b>	Servo drives that are UL Recognized Components for the US and Canada in accordance with UL61800-5-1 are available as an option (SMx9G16 models only).
<b>CE marked</b>	All servo drives are CE marked in accordance with EN60204-1 (IEC204-1).
<b>RoHS compliant</b>	All servo drives are RoHS compliant.
<b>Connectivity</b>	
<b>CANopen</b>	High-speed (up to 1 Mbps/s) CAN interface for communications between nodes in real-time control applications. The drive device profile is based on IEC 61800-7-301/201 (CiA 402).
<b>EtherCAT (9GE only)</b>	CANopen over EtherCAT, the drive device profile is based on IEC 61800-7-201 (CiA 402). The minimum sync cycle time is 125 μs (8 kHz).
<b>RS-232 or RS-485</b>	High speed (115.2K baud) serial communication interface for setup and tuning and diagnostics. Note: RS-485 is optional.
<b>On-board USB to RS-232 converter</b>	USB 2.0 Type A port is available to connect the drive to a PC, without the need for a USB to serial adapter. (9GE only)
<b>Feedback</b>	
<b>Encoder feedback</b>	Accepts quadrature feedback up to 40 MHz (10 MHz per channel). By special request only, quadrature feedback up to 100 MHz (25 MHz per channel) may be possible. Absolute serial encoder (BiSS, EnDat, and T-Format). Analog Sin/Cos encoder.
<b>Encoder Output Divider</b>	The encoder input signal can be divided by a user selectable integer for the encoder output signal. Note: Available upon request only.
<b>Tachometer feedback</b>	Accepts analog signals from all types of tachometer feedback.
<b>Resolver feedback</b>	For resolver feedback the drive creates a simulated encoder output with a typical resolution of 12 bits.
<b>Two feedback devices</b>	We can accept any of the feedback devices listed above plus an additional incremental encoder.
<b>I/O</b>	
<b>Programmable Functions</b>	Analog signal command, +/- limits, inhibit/enable, fault, reset, motor temperature, encoder and step & direction.
<b>Input</b>	
<b>Wide operating voltage</b>	24-710 VDC for drive modules. Stand alone and multi axis versions can be ordered for operation from either 110-130 VAC, 208-240 VAC, 360-400 VAC, and 460-500 VAC main lines (single or 3-phase, 50/60 Hz). Note: Non-standard voltages can be ordered upon request.
<b>Direct AC operation</b>	The stand-alone units and multi-axis chassis include DC bus power supplies, cooling fans and a regen clamp with dissipation resistor.
<b>External logic supply</b>	24-48 VDC, 600mA max @ 24 VDC powers all logic & encoder. Works as a "keep alive" for drives.
<b>Build</b>	
<b>Complete isolation</b>	Complete isolation between signal and power stage.
<b>Non-volatile memory</b>	All parameters are stored in non-volatile memory for reliable start up. Note: Available upon request, up to 16 different configurations can be stored in the drives's non-volatile memory.
<b>Relay outputs</b>	Two pins provide an interface for the relay. They turn on when a desired condition occurs.
<b>Status indicator</b>	8-segment display (9G16) or dual 8-segment display (9GE) indicates drive status and diagnostics.
<b>SMT construction</b>	Provides ultra compact size, cost competitive package and high reliability.

# GAMMA SERIES (9G16) ELECTRICAL RATINGS

Input Voltage			Output Current <sup>(1)</sup>			Available Package Configurations			UL <sup>(4)</sup>	Heatsink Type (Derating Factor) <sup>(2)</sup>	
VDC	VAC	Model Code <sup>(3)</sup>	Cont. A (A <sub>RMS</sub> )	Peak A (A <sub>RMS</sub> )	Model Code <sup>(3)</sup>	Module	Stand Alone	Multi-Axis		Module	Stand Alone
24-60	N/A	0	5 (3.5)	10 (7.1)	1	•			•	L-Bracket (1)	N/A
24-60	N/A	0	10 (7.1)	20 (14.1)	3	•			•	L-Bracket (1)	N/A
24-60	N/A	0	15 (10.6)	30 (21.2)	4	•			•	L-Bracket (1)	N/A
24-60	N/A	0	20 (14.1)	40 (28.3)	5	•			•	L-Bracket (1)	N/A
24-60	N/A	0	25 (17.7)	50 (35.4)	6	•			•	L-Bracket (1)	N/A
24-60	N/A	0	30 (21.2)	60 (42.4)	7	•			•	L-Bracket (1)	N/A
24-60	N/A	0	45 (31.8)	80 (56.6)	8	•			•	L-Bracket (2)	N/A
60-190	110-130	1	5 (3.5)	10 (7.1)	1	•	•	•	•	L-Bracket (1)	LB (1)/ SF (1)*
60-190	110-130	1	10 (7.1)	20 (14.1)	3	•	•	•	•	L-Bracket (1)	LB (1)/ SF (1)*
60-190	110-130	1	15 (10.6)	30 (21.2)	4	•	•	•	•	L-Bracket (2)	LB (2)/ SF (1)*
60-190	110-130	1	20 (14.1)	40 (28.3)	5	•	•	•	•	Short Fin (1)	Short Fin (1)
60-190	110-130	1	25 (17.7)	50 (35.4)	6	•	•	•	•	Short Fin (2)	Short Fin (2)
60-190	110-130	1	30 (21.2)	60 (42.4)	7	•	•	•	•	Long Fin (1)	Long Fin (1)
60-190	110-130	1	45 (31.8)	80 (56.6)	8	•	•	•	•	Long Fin (2)	Long Fin (2)
190-370	208-240	2	5 (3.5)	10 (7.1)	1	•	•	•	•	L-Bracket (1)	LB (1)/ SF (1)*
190-370	208-240	2	10 (7.1)	20 (14.1)	3	•	•	•	•	L-Bracket (2)	LB (2)/ SF (1)*
190-370	208-240	2	15 (10.6)	30 (21.2)	4	•	•	•	•	L-Bracket (3)	LB (3)/ SF (2)*
190-370	208-240	2	20 (14.1)	40 (28.3)	5	•	•	•	•	Short Fin (2)	Short Fin (2)
190-370	208-240	2	25 (17.7)	50 (35.4)	6	•	•	•	•	Short Fin (3)	Short Fin (3)
190-370	208-240	2	30 (21.2)	60 (42.4)	7	•	•	•	•	Long Fin (2)	Long Fin (2)
190-370	208-240	2	45 (31.8)	80 (56.6)	8	•	•	•	•	Long Fin (3)	Long Fin (3)
370-565	360-400	3	5 (3.5)	10 (7.1)	1	•	•	•	•	L-Bracket (2)	LB (2)/ SF(1)*
370-565	360-400	3	10 (7.1)	20 (14.1)	3	•	•	•	•	Short Fin (2)	Short Fin (2)
370-565	360-400	3	15 (10.6)	30 (21.2)	4	•	•	•	•	Short Fin (3)	Short Fin (3)
370-565	360-400	3	20 (14.1)	40 (28.3)	5	•	•	•	•	Long Fin (2)	Long Fin (2)
370-565	360-400	3	25 (17.7)	50 (35.4)	6	•	•	•	•	Long Fin (3)	Long Fin (3)
370-565	360-400	3	30 (21.2)	60 (42.4)	7	•	•	•	•	Long Fin (4)	Long Fin (4)
565-710	460-500	4	5 (3.5)	10 (7.1)	1	•	•	•	•	L-Bracket (3)	LB (3)/ SF (2)*
565-710	460-500	4	10 (7.1)	20 (14.1)	3	•	•	•	•	Short Fin (3)	Short Fin (3)
565-710	460-500	4	15 (10.6)	30 (21.2)	4	•	•	•	•	Long Fin (3)	Long Fin (3)
565-710	460-500	4	20 (14.1)	40 (28.3)	5	•	•	•	•	Long Fin (4)	Long Fin (4)

**Notes:**

<sup>(1)</sup> The column **Cont. Output Current** is the continuous current and the column **Peak Output Current** is the intermittent peak current. For output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs or VDC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(2)</sup> Three heatsink types, L-Bracket (LB), Short Fin (SF), and Long Fin (LF) are available depending on the input voltage and output current. For certain Stand Alone units the customer must choose the heatsink type based on their application. These models are marked with an asterisk, ex. LB (1)/ SF (2)\*. For dimensions, refer to [pg. 10](#). There are 4 standard categories for ambient operating temperature and current derating denoted by the number following the heatsink type. All categories require forced air cooling.

Category 1: 0 to 60 °C without derating. Derate current 10% per °C over 60 °C.

Category 2: 0 to 50 °C without derating. Derate current 5% per °C over 50 °C.

Category 3: 0 to 40 °C without derating. Derate current 3% per °C over 40 °C.

Category 4: 0 to 30 °C without derating. Derate current 2.5% per °C over 30 °C.

Special: Contact Glentek for models with a lower operating temperature limit of -40 °C.

<sup>(3)</sup> Model Codes are used on [pgs. 12-17](#) for model numbering

<sup>(4)</sup> UL Recognized Components are available as an option for the selected drives.

<sup>(5)</sup> Bus power logic (SMB models) not available for input voltages of greater than 370 VDC (Module) or 360 VAC (Stand Alone and Multi-Axis).

# GAMMA SERIES (9GE) ELECTRICAL RATINGS

Model Number Code <sup>(3)</sup>	Input Voltage		Output Current <sup>(1)</sup>				Available Package Configurations			Heatsink Type (Derating Factor) <sup>(2)</sup>
	VDC	VAC	Model Number Code <sup>(3)</sup>	Cont. A (A <sub>RMS</sub> )	Peak A (A <sub>RMS</sub> )	Model Number Code <sup>(3)</sup>	Module	Stand Alone	Multi-Axis	
15	24-60	N/A	0	5 (3.5)	10 (7.1)	1	•			L-Bracket (1)
15	24-60	N/A	0	10 (7.1)	20 (14.1)	3	•			L-Bracket (1)
15	24-60	N/A	0	15 (10.6)	30 (21.2)	4	•			L-Bracket (1)
15	24-60	N/A	0	20 (14.1)	40 (28.3)	5	•			L-Bracket (1)
15	24-60	N/A	0	25 (17.7)	50 (35.4)	6	•			L-Bracket (1)
15	24-60	N/A	0	30 (21.2)	60 (42.4)	7	•			L-Bracket (2)
15	24-60	N/A	0	45 (31.8)	80 (56.6)	8	•			L-Bracket (3)
15	60-190	110-130	1	5 (3.5)	10 (7.1)	1	•	•	•	L-Bracket (1)
15	60-190	110-130	1	10 (7.1)	20 (14.1)	3	•	•	•	L-Bracket (1)
15	60-190	110-130	1	15 (10.6)	30 (21.2)	4	•	•	•	L-Bracket (2)
15	60-190	110-130	1	20 (14.1)	40 (28.3)	5	•	•	•	Short Fin (2)
15	60-190	110-130	1	25 (17.7)	50 (35.4)	6	•	•	•	Short Fin (3)
15	190-370	208-240	2	5 (3.5)	10 (7.1)	1	•	•	•	L-Bracket (1)
15	190-370	208-240	2	10 (7.1)	20 (14.1)	3	•	•	•	L-Bracket (2)
15	190-370	208-240	2	15 (10.6)	30 (21.2)	4	•	•	•	L-Bracket (3)
15	190-370	208-240	2	20 (14.1)	40 (28.3)	5	•	•	•	Short Fin (3)
15	190-370	208-240	2	25 (17.7)	50 (35.4)	6	•	•	•	Short Fin (4)
15	370-565	360-400	3	5 (3.5)	10 (7.1)	1	•	•	•	L-Bracket (2)
15	370-565	360-400	3	10 (7.1)	20 (14.1)	3	•	•	•	Short Fin (2)
15	370-565	360-400	3	15 (10.6)	30 (21.2)	4	•	•	•	Short Fin (3)
15	370-565	360-400	3	20 (14.1)	40 (28.3)	5	•	•	•	Long Fin (3)
15	370-565	360-400	3	25 (17.7)	50 (35.4)	6	•	•	•	Long Fin (4)
30	N/A	110-130	1	30 (21.2)	60 (42.4)	7		•		Long Fin (2)
30	N/A	208-240	2	30 (21.2)	60 (42.4)	7		•		Long Fin (3)
45	N/A	110-130	1	45 (31.8)	80 (56.6)	8		•		Long Fin (2)
45	N/A	208-240	2	45 (31.8)	80 (56.6)	8		•		Long Fin (3)
75	N/A	110-130	1	75 (53)	120 (84.9)	9		•		Long Fin (3)
75	N/A	208-240	2	75 (53)	120 (84.9)	9		•		Long Fin (4)

## Notes:

<sup>(1)</sup> The column Cont. Output Current is the continuous current and the column Peak Output Current is the intermittent peak current. For output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs or VDC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(2)</sup> Three heatsink types (L-Bracket, Short Fin, and Long Fin) are available depending on the input voltage and output current. For dimensions, refer to [pgs. 10-11](#). There are 4 standard categories for ambient operating temperature and current derating denoted by the number following the heatsink type. All categories require forced air cooling.

Category 1: 0 to 60 °C without derating. Derate current 10% per °C over 60 °C.

Category 2: 0 to 50 °C without derating. Derate current 5% per °C over 50 °C.

Category 3: 0 to 40 °C without derating. Derate current 3% per °C over 40 °C.

Category 4: 0 to 30 °C without derating. Derate current 2.5% per °C over 30 °C.

Special: Contact Glentek for models with a lower operating temperature limit of -40 °C.

<sup>(3)</sup> Model Codes are used on [pgs. 12-17](#) for model numbering

<sup>(5)</sup> Bus power logic (SMB models) not available for input voltages of greater than 370 VDC (Module) or 360 VAC (Stand Alone and Multi-Axis).

# GAMMA SERIES DIGITAL PWM SERVO DRIVE DIMENSIONS

## Package Configuration Selection Table

Glentek offers three different types of packages: stand alone, module, and multi-axis. Stand alone and multi-axis packages require an AC input and are available in three configurations: A, B, and F. These codes are used in the model numbering. Modules require a DC input. The table below specifies the differences between the various package configurations. Custom configurations are available upon request. **Note: Heatsink type: LB = L-Bracket, SF = Short Fin, LF = Long Fin.**

Feature	Stand Alone: A	Stand Alone: B	Stand Alone: F	Module	Multi-Axis: A	Multi-Axis: B
Drive(s)	1	1	1	1	1-5	1-5
DC Bus Power Supply	•	•	•		•	•
In-rush current limiting at power on	•	•	•		•	•
Regen Clamp	•		•		•	
Dissipation Resistor	•				•	
Fan(s)	•	•			•	•
Heatsink type	SF or LF	SF or LF	LB	LB, SF, or LF	LB, SF, or LF	LB, SF, or LF
Fuses					•	•

## Stand Alone

This type of package is typically used for one or multi-axis applications. **Refer to the electrical ratings on [pgs. 8-9](#) to determine heatsink type based on the input voltage and output current.**

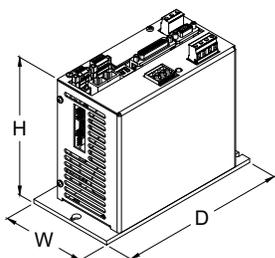
### Version/Model Numbers: 9G16

Heatsink Type	Regen Option	Dimensions, Inches (mm)			Weight lbs. (kg)	Fan
		Width	Height	Depth		
L-Bracket	1F	3.5 (90)	8.6 (217)	8.7 (220)	8.3 (3.8)	No
Short Fin	1A / 1B	5.2 (132)	8.2 (208)	10.9 (276)	9.0 (4.1)	Yes
Long Fin	1A / 1B	6.6 (168)	8.2 (208)	10.9 (276)	9.5 (4.3)	Yes

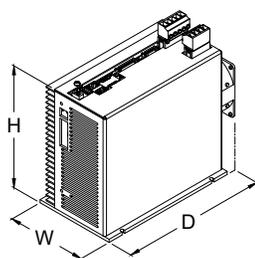
### Version/Model Numbers: 9GE

Model Number <sup>(1)</sup>	Heatsink Type	Regen Option	Dimensions, Inches (mm)			Weight lbs. (kg)	Fan
			Width	Height	Depth		
<b>SMx9GE15</b>	L-Bracket	1F	4.0 (102)	6.2 (156)	7.9 (220)	4.0 (1.8)	No
	Short Fin	1A	4.0 (102)	6.2 (156)	9.0 (229)	4.7 (2.1)	Yes
	Short Fin	1B	4.0 (102)	6.2 (156)	9.0 (229)	4.7 (2.1)	Yes
	Short Fin	1F	4.0 (102)	6.2 (156)	7.9 (220)	4.7 (2.1)	No
	Long Fin	1A	5.4 (138)	6.2 (156)	9.0 (229)	6.0 (2.7)	Yes
	Long Fin	1B	5.4 (138)	6.2 (156)	9.0 (229)	6.0 (2.7)	Yes
	Long Fin	1F	5.4 (138)	6.2 (156)	7.9 (220)	6.0 (2.7)	No
<b>SMx9GE30</b>	Long Fin	1A	5.3 (135)	9.3 (237)	12.5 (317)	11.0 (4.9)	Yes
<b>SMx9GE45</b>	Long Fin	1A	5.3 (135)	9.4 (238)	14.4 (366)	11.8 (5.4)	Yes
<b>SMx9GE75</b>	Long Fin	1A	5.9 (149)	12.6 (320)	17.6 (448)	25.5 (11.3)	Yes

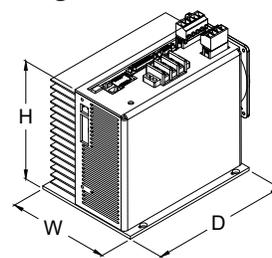
L-Bracket Stand Alone



Short Fin Stand Alone



Long Fin Stand Alone



# GAMMA SERIES DIGITAL PWM SERVO DRIVE DIMENSIONS

## Module

This type of package is typically used for cost sensitive applications where the customer provides DC bus power supply, forced-air cooling, and regen clamp. **Refer to the electrical ratings on [pgs. 8-9](#) to determine heatsink type based on the input voltage and output current.**

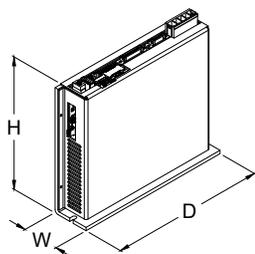
### Version/Model Numbers: 9G16

Heatsink Type	Dimensions, Inches (mm)			Weight lbs. (kg)
	Width	Height	Depth	
L-Bracket	2.0 (51)	7.6 (193)	8.8 (224)	2.6 (1.2)
Short Fin	2.5 (64)	7.6 (193)	8.8 (224)	4.0 (1.8)
Long Fin	3.8 (95)	7.6 (193)	8.8 (224)	4.5 (2.0)

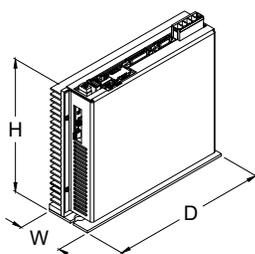
### Version/Model Numbers: 9GE15

Heatsink Type	Dimensions, Inches (mm)			Weight lbs. (kg)
	Width	Height	Depth	
L-Bracket	1.6 (41)	5.1 (130)	7.1 (181)	1.8 (.8)
Short Fin	2.4 (60)	5.1 (130)	7.1 (181)	2.8 (1.3)
Long Fin	3.7 (94)	5.1 (130)	7.1 (181)	4.0 (1.8)

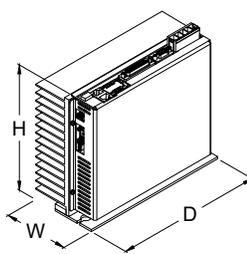
L-Bracket Module



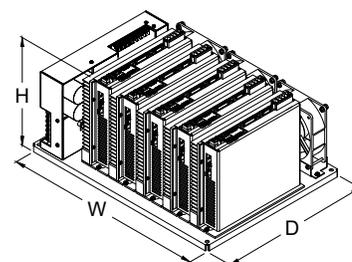
Short Fin Module



Long Fin Module



Multi-Axis



## Multi-Axis

This package consists of an open frame base plate chassis. Available in a 2, 4, and 5 axis package. **Refer to the electrical ratings on [pgs. 8-9](#) to determine heatsink type based on the input voltage and output current.**

### Version/Model Numbers: 9G16

Axes	Heatsink Type	Dimensions, Inches (mm)			Weight lbs. (kg)
		Width	Height	Depth	
2	L-Bracket	9.8 (248)	8.1 (205)	11.8 (298)	13.0 (5.9)
2	Small Fin	9.8 (248)	8.1 (205)	11.8 (298)	16.0 (7.3)
2	Long Fin	14.9 (378)	8.1 (205)	11.8 (298)	18.5 (8.4)
4	L-Bracket	14.9 (378)	8.1 (205)	11.8 (298)	20.0 (9.1)
4	Small Fin	14.9 (378)	8.1 (205)	11.8 (298)	24.0 (10.9)
5	L-Bracket	18.8 (476)	8.1 (205)	11.8 (298)	23.0 (10.4)
5	Small Fin	18.8 (476)	8.1 (205)	11.8 (298)	30.0 (13.6)

### Version/Model Numbers: 9GE15

Axes	Heatsink Type	Dimensions, Inches (mm)			Weight lbs. (kg)
		Width	Height	Depth	
2	L-Bracket	9.0 (229)	7.7 (197)	10.8 (273)	13.0 (5.9)
2	Small Fin	9.8 (248)	7.7 (197)	10.8 (273)	16.0 (7.3)
2	Long Fin	14.9 (378)	7.7 (197)	10.8 (273)	18.5 (8.4)
4	L-Bracket	13.0 (330)	7.7 (197)	10.8 (273)	20.0 (9.1)
4	Small Fin	14.9 (378)	7.7 (197)	10.8 (273)	24.0 (10.9)
5	L-Bracket	18.8 (476)	7.7 (197)	11.8 (298)	23.0 (10.4)
5	Small Fin	18.8 (476)	7.7 (197)	11.8 (298)	30.0 (13.6)



# GAMMA SERIES (9GE) STAND ALONE MODEL NUMBERING

Notes: ① ② ③ ④ ⑤ ⑥ see [pg. 14](#) for more details.



On-Board or External Bus Logic ①	
<b>B</b>	Bus Power Logic
<b>C</b>	24 VDC External Logic Power, Keep Alive

Drive Model ②			
<b>15</b>	5 to 45 A Models	<b>45</b>	45 A Models
<b>30</b>	30 A Models	<b>75</b>	75 A Models

Input Voltage ②			
<b>1</b>	110-130 VAC	<b>2</b>	208-240 VAC
<b>3</b>	360-400 VAC		

Continuous Output Current ②							
<b>1</b>	5 A	<b>4</b>	15 A	<b>6</b>	25 A	<b>8</b>	45 A
<b>3</b>	10 A	<b>5</b>	20 A	<b>7</b>	30 A	<b>9</b>	75 A

Operation Modes	
<b>(Insert a 0 if the option is not included, or a 1 if it is included)</b>	
	Brushless Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)
	Brush Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)
	External Sine Commutation / 2 Phase Current Mode ③

Feedback Options	
<b>A</b>	No feedback devices
<b>B</b>	Incremental (TTL) Quadrature Encoder and/or Hall Sensor/Comm. Track
<b>C</b>	Analog Sin/Cos Encoder and/or Hall Sensor/Commutation Track
<b>D</b>	Resolver
<b>E</b>	Absolute Encoder without Analog Sin/Cos Channels
<b>F</b>	Tachometer ③
<b>G</b>	Absolute Encoder with Analog Sin/Cos Channels
<b>Z</b>	Special

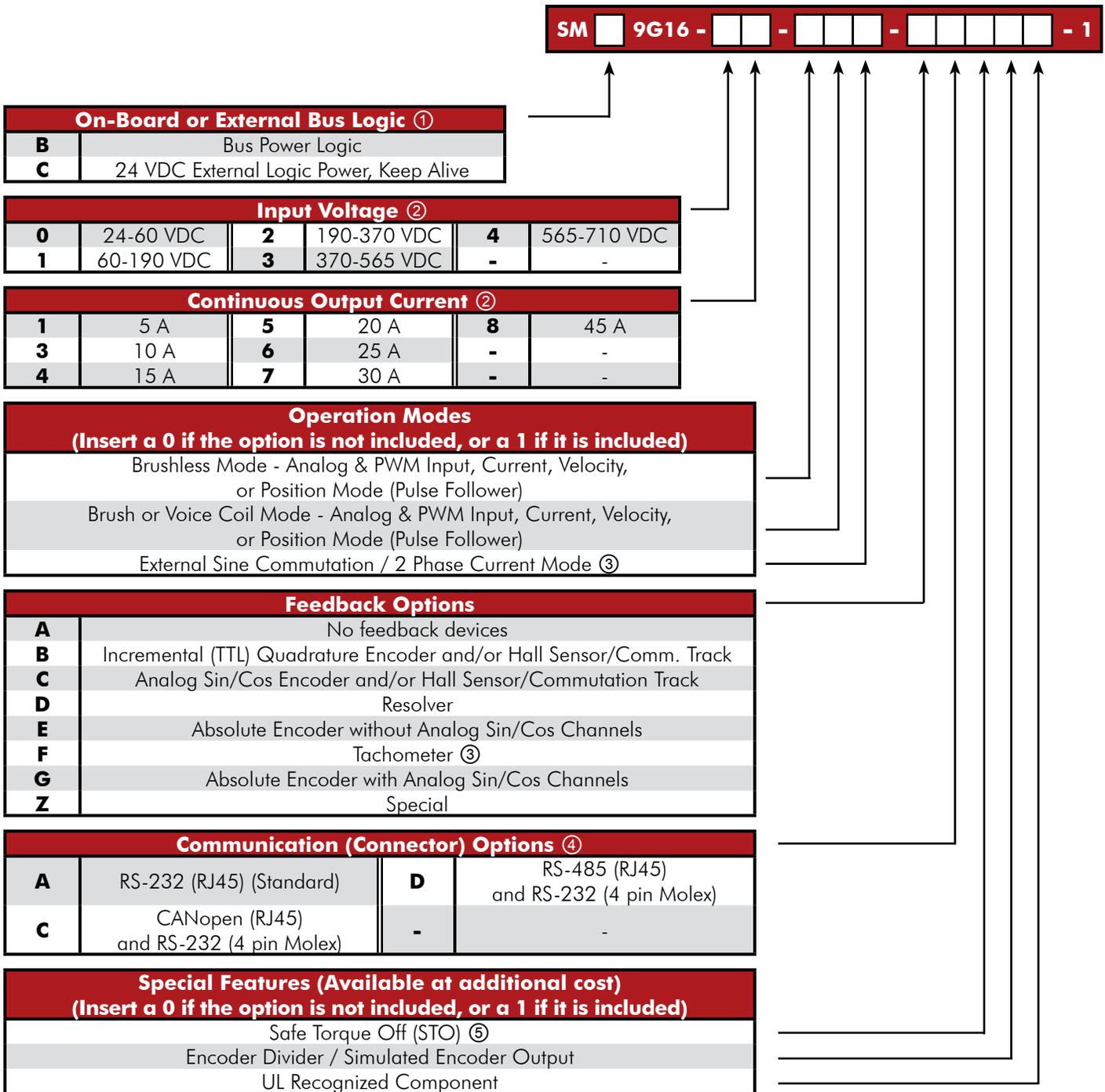
Communication (Connector) Options ④			
<b>A</b>	RS-232 (RJ45)	<b>E</b>	RS-232 (USB 2.0 Type A) (Standard)
<b>B</b>	EtherCAT (RJ45) and RS-232 (4 pin Molex)	<b>F</b>	EtherCAT (RJ45) and RS-232 (USB 2.0 Type A)
<b>C</b>	CANopen (RJ45) and RS-232 (4 pin Molex)	<b>G</b>	CANopen (RJ45) and RS-232 (USB 2.0 Type A)
<b>D</b>	RS-485 (RJ45) and RS-232 (USB 2.0 Type A)	-	-

Special Features (Available at additional cost)	
<b>(Insert a 0 if the option is not included, or a 1 if it is included)</b>	
	Safe Torque Off (STO) ⑤
	Encoder Divider / Simulated Encoder Output

Stand Alone Package Configuration	
<b>A</b>	Built In Regen Clamp with dissipation resistor and fan(s) (Standard for drives with a cont. current $\geq 20$ amps)
<b>B</b>	No Built In Regen Clamp
<b>C</b>	Custom (Contact Glentek)
<b>F</b>	Built in Regen Clamp without dissipation resistor nor fan ⑥

Fan Voltage			
<b>0</b>	No Fan	<b>1</b>	115 VAC
		<b>2</b>	230 VAC

# GAMMA SERIES (9G16) MODULE MODEL NUMBERING



**Notes (For 9G16 and 9GE Stand Alone, Module, and Multi-Axis models):**

- ① Bus power logic (SMB models) not available for input voltages of greater than 370 VDC (Module) or 360 VAC (Stand Alone and Multi-Axis).
- ② Refer to the Electrical Ratings on [pgs. 8-9](#) for available combinations of voltage and current.
- ③ External sine commutation and tachometer may not both be selected.
- ④ RS-232 is typically used for communicating with Glentek's MotionMaestro software for initial drive setup, configuration, and monitoring.
- ⑤ Safe Torque Off (STO) option might require longer lead times, depending on the model.
- ⑥ External forced air cooling must be supplied for rated current.

# GAMMA SERIES (9GE) MODULE MODEL NUMBERING

Notes: ① ② ③ ④ ⑤ ⑥ see [pg. 14](#) for more details.



On-Board or External Bus Logic ①	
<b>B</b>	Bus Power Logic
<b>C</b>	24 VDC External Logic Power, Keep Alive

Input Voltage ②			
<b>0</b>	24-60 VDC	<b>2</b>	190-370 VDC
<b>1</b>	60-190 VDC	<b>3</b>	370-565 VDC

Continuous Output Current ②					
<b>1</b>	5 A	<b>5</b>	20 A	<b>8</b>	45 A
<b>3</b>	10 A	<b>6</b>	25 A	-	-
<b>4</b>	15 A	<b>7</b>	30 A	-	-

Operation Modes (Insert a 0 if the option is not included, or a 1 if it is included)	
	Brushless Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)
	Brush Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)
	External Sine Commutation / 2 Phase Current Mode ③

Feedback Options	
<b>A</b>	No feedback devices
<b>B</b>	Incremental (TTL) Quadrature Encoder and/or Hall Sensor/Comm. Track
<b>C</b>	Analog Sin/Cos Encoder and/or Hall Sensor/Commutation Track
<b>D</b>	Resolver
<b>E</b>	Absolute Encoder without Analog Sin/Cos Channels
<b>F</b>	Tachometer ③
<b>G</b>	Absolute Encoder with Analog Sin/Cos Channels
<b>Z</b>	Special

Communication (Connector) Options ④			
<b>A</b>	RS-232 (RJ45)	<b>E</b>	RS-232 (USB 2.0 Type A) (Standard)
<b>B</b>	EtherCAT (RJ45) and RS-232 (4 pin Molex)	<b>F</b>	EtherCAT (RJ45) and RS-232 (USB 2.0 Type A)
<b>C</b>	CANopen (RJ45) and RS-232 (4 pin Molex)	<b>G</b>	CANopen (RJ45) and RS-232 (USB 2.0 Type A)
<b>D</b>	RS-485 (RJ45) and RS-232 (USB 2.0 Type A)	-	-

Special Features (Available at additional cost) (Insert a 0 if the option is not included, or a 1 if it is included)	
	Safe Torque Off (STO) ⑤
	Encoder Divider / Simulated Encoder Output

# GAMMA SERIES (9G16) MULTI-AXIS MODEL NUMBERING

Notes: ① ② ③ ④ ⑤ ⑥ see [pg. 14](#) for more details.



On-Board or External Bus Logic ①	
<b>B</b>	Bus Power Logic
<b>C</b>	24 VDC External Logic Power, Keep Alive

Input Voltage ②			
-	-	<b>3</b>	360-400 VAC
<b>1</b>	110-130 VAC	<b>4</b>	460-500 VAC
<b>2</b>	208-240 VAC	-	-

Continuous Output Current ②					
<b>1</b>	5 A	<b>5</b>	20 A	<b>8</b>	45 A
<b>3</b>	10 A	<b>6</b>	25 A	-	-
<b>4</b>	15 A	<b>7</b>	30 A	-	-

Operation Modes (Insert a 0 if the option is not included, or a 1 if it is included)	
Brushless Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)	
Brush or Voice Coil Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)	
External Sine Commutation / 2 Phase Current Mode ③	

Feedback Options	
<b>A</b>	No feedback devices
<b>B</b>	Incremental (TTL) Quadrature Encoder and/or Hall Sensor/Comm. Track
<b>C</b>	Analog Sin/Cos Encoder and/or Hall Sensor/Commutation Track
<b>D</b>	Resolver
<b>E</b>	Absolute Encoder without Analog Sin/Cos Channels
<b>F</b>	Tachometer ③
<b>G</b>	Absolute Encoder with Analog Sin/Cos Channels
<b>Z</b>	Special

Communication (Connector) Options ④			
<b>A</b>	RS-232 (RJ45) (Standard)	<b>D</b>	RS-485 (RJ45) and RS-232 (4 pin Molex)
<b>C</b>	CANopen (RJ45) and RS-232 (4 pin Molex)	-	-

Special Features (Available at additional cost) (Insert a 0 if the option is not included, or a 1 if it is included)	
Safe Torque Off (STO) ⑤	
Encoder Divider / Simulated Encoder Output	
UL Recognized Component	

Mounting Configuration					
<b>2</b>	2-Axis Chassis	<b>4</b>	4-Axis Chassis	<b>5</b>	5-Axis Chassis

Multi-Axis Package Configuration	
<b>A</b>	Built In Regen Clamp with Dissipation Resistor (Standard)
<b>B</b>	No Built In Regen Clamp
<b>C</b>	Custom (Contact Glentek)

Number of Drive Modules Installed			
<b>1</b>	1 Drive Module (2-Axis Chassis)	<b>4</b>	4 Drive Modules (4-Axis Chassis)
<b>2</b>	2 Drive Modules (2-Axis Chassis)	<b>5</b>	5 Drive Modules (5-Axis Chassis)
<b>3</b>	3 Drive Modules (4-Axis Chassis)	-	-

Fan Voltage			
<b>1</b>	115 VAC	<b>2</b>	230 VAC

# GAMMA SERIES (9GE) MULTI-AXIS MODEL NUMBERING

Notes: ① ② ③ ④ ⑤ ⑥ see [pg. 14](#) for more details.

SM    9GE15 -    -      -        0 -      -    -   

On-Board or External Bus Logic ①	
<b>B</b>	Bus Power Logic
<b>C</b>	24 VDC External Logic Power, Keep Alive

Input Voltage ②			
<b>1</b>	110-130 VAC	<b>3</b>	360-400 VAC
<b>2</b>	208-240 VAC	-	-

Continuous Output Current ②					
<b>1</b>	5 A	<b>5</b>	20 A	<b>8</b>	45 A
<b>3</b>	10 A	<b>6</b>	25 A	-	-
<b>4</b>	15 A	<b>7</b>	30 A	-	-

Operation Modes (Insert a 0 if the option is not included, or a 1 if it is included)	
Brushless Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)	
Brush Mode - Analog & PWM Input, Current, Velocity, or Position Mode (Pulse Follower)	
External Sine Commutation / 2 Phase Current Mode ③	

Feedback Options	
<b>A</b>	No feedback devices
<b>B</b>	Incremental (TTL) Quadrature Encoder and/or Hall Sensor/Comm. Track
<b>C</b>	Analog Sin/Cos Encoder and/or Hall Sensor/Commutation Track
<b>D</b>	Resolver
<b>E</b>	Absolute Encoder without Analog Sin/Cos Channels
<b>F</b>	Tachometer ③
<b>G</b>	Absolute Encoder with Analog Sin/Cos Channels
<b>Z</b>	Special

Communication (Connector) Options ④			
<b>A</b>	RS-232 (RJ45)	<b>E</b>	RS-232 (USB 2.0 Type A) (Standard)
<b>B</b>	EtherCAT (RJ45) and RS-232 (4 pin Molex)	<b>F</b>	EtherCAT (RJ45) and RS-232 (USB 2.0 Type A)
<b>C</b>	CANopen (RJ45) and RS-232 (4 pin Molex)	<b>G</b>	CANopen (RJ45) and RS-232 (USB 2.0 Type A)
<b>D</b>	RS-485 (RJ45) and RS-232 (USB 2.0 Type A)	-	-

Special Features (Available at additional cost) (Insert a 0 if the option is not included, or a 1 if it is included)	
Safe Torque Off (STO) ⑤	
Encoder Divider / Simulated Encoder Output	

Mounting Configuration					
<b>2</b>	2-Axis Chassis	<b>4</b>	4-Axis Chassis	<b>5</b>	5-Axis Chassis

Multi-Axis Package Configuration	
<b>A</b>	Built In Regen Clamp with Dissipation Resistor (Standard)
<b>B</b>	No Built In Regen Clamp
<b>C</b>	Custom (Contact Glentek)

Number of Drive Modules Installed			
<b>1</b>	1 Drive Module (2-Axis Chassis)	<b>4</b>	4 Drive Modules (4-Axis Chassis)
<b>2</b>	2 Drive Modules (2-Axis Chassis)	<b>5</b>	5 Drive Modules (5-Axis Chassis)
<b>3</b>	3 Drive Modules (4-Axis Chassis)	-	-

Fan Voltage			
<b>1</b>	115 VAC	<b>2</b>	230 VAC

# DC BUS POWER SUPPLY (RECTIFIER) ASSEMBLIES

## Model Numbering

This section explains the model numbering system for Glentek's GP8600-76 DC bus power supply (rectifier) assemblies. The model numbering system is designed so that you, our customer, will be able to quickly and accurately create the model number for the DC bus power supply (rectifier) assembly that best suits your requirements. Complete the configuration code you require using the information on this page. After completing your model number, please contact a Glentek Sales Engineer to confirm that the model number you have created is correct.

GP8600 - 76 -   -  -  -

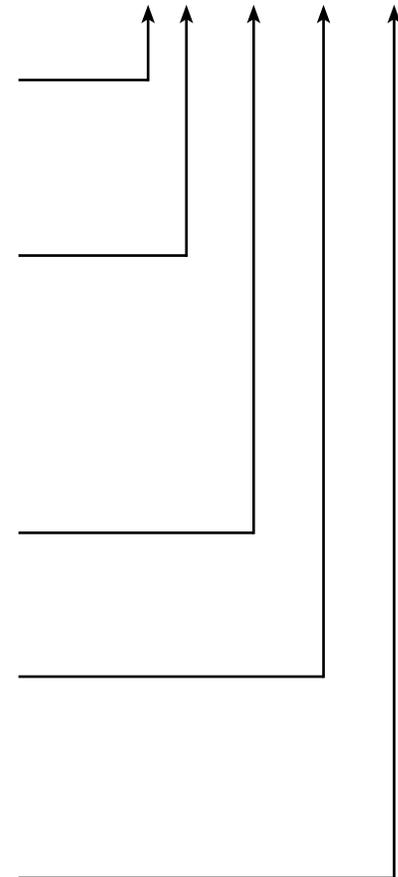
Input Voltage	
1	110-130 VAC
2	208-240 VAC
3	360-400 VAC
4	460-500 VAC

Continuous Output Current A ( $A_{RMS}$ ) per axis <sup>(1)</sup>	
1	5 (4)
3	10 (7)
4	15 (11)
5	20 (14)
6	25 (18)
7	30 (22)
8	45 (32)

Package Configuration	
A	Built in Regen Clamp with Dumping Resistor
B	No Built in Regen Clamp
C	Custom

Number of Axes Utilized	
1	1 Axis
2	2 Axis
3	3 Axis
4	4 Axis
5	5 Axis

UL Recognized Component <sup>(2)</sup>	
0	not UL Recognized
1	UL Recognized



**NOTES:**

<sup>(1)</sup> For continuous output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(2)</sup> See [pg. 19](#) for non-UL and UL Recognized Component combinations of input voltage, output current, and number of axes for SMB/SMC9G16 Gamma series drives.

<sup>(3)</sup> See [pg. 20](#) for combinations of input voltage, output current, and number of axes for SMB/SMC9GE15 Gamma series drives.

# DC BUS POWER SUPPLY (RECTIFIER) ASSEMBLIES

## Electrical Ratings for use with SMB/SMC9G16 Gamma Series Drives

Input Voltage		Output Current, per axis <sup>(1)</sup>			UL Recognized Component <sup>(4)</sup>	Max. No. of Axes		Module Heatsink Type (Derating Factor) <sup>(2)</sup>
VAC	Model Code <sup>(3)</sup>	Cont. A (A <sub>RMS</sub> )	Peak A (A <sub>RMS</sub> )	Model Code <sup>(3)</sup>		Non-UL	UL	
110-130	1	5 (3.5)	10 (7.1)	1	•	5	5	L-Bracket (1)
110-130	1	10 (7.1)	20 (14.1)	3	•	5	5	L-Bracket (1)
110-130	1	15 (10.6)	30 (21.2)	4	•	5	5	L-Bracket (2)
110-130	1	20 (14.1)	40 (28.3)	5	•	5	5	Short Fin (1)
110-130	1	25 (17.7)	50 (35.4)	6	•	5	2	Short Fin (2)
110-130	1	30 (21.2)	60 (42.4)	7	•	2	2	Long Fin (1)
110-130	1	45 (31.8)	80 (56.6)	8	•	2	2	Long Fin (2)
208-240	2	5 (3.5)	10 (7.1)	1	•	5	5	L-Bracket (1)
208-240	2	10 (7.1)	20 (14.1)	3	•	5	5	L-Bracket (2)
208-240	2	15 (10.6)	30 (21.2)	4	•	5	5	L-Bracket (3)
208-240	2	20 (14.1)	40 (28.3)	5	•	5	5	Short Fin (2)
208-240	2	25 (17.7)	50 (35.4)	6	•	5	2	Short Fin (3)
208-240	2	30 (21.2)	60 (42.4)	7	•	2	2	Long Fin (2)
208-240	2	45 (31.8)	80 (56.6)	8	•	2	2	Long Fin (3)
360-400	3	5 (3.5)	10 (7.1)	1	•	5	5	L-Bracket (2)
360-400	3	10 (7.1)	20 (14.1)	3	•	5	5	Short Fin (2)
360-400	3	15 (10.6)	30 (21.2)	4	•	5	2	Short Fin (3)
360-400	3	20 (14.1)	40 (28.3)	5	N/A	2	N/A	Long Fin (2)
360-400	3	25 (17.7)	50 (35.4)	6	N/A	2	N/A	Long Fin (3)
360-400	3	30 (21.2)	60 (42.4)	7	N/A	2	N/A	Long Fin (4)
460-500	4	5 (3.5)	10 (7.1)	1	•	5	5	L-Bracket (3)
460-500	4	10 (7.1)	20 (14.1)	3	•	5	5	Short Fin (3)
460-500	4	15 (10.6)	30 (21.2)	4	•	2	2	Long Fin (3)
460-500	4	20 (14.1)	40 (28.3)	5	N/A	2	N/A	Long Fin (4)

### Notes:

<sup>(1)</sup> The column **Cont. Output Current** is the continuous current and the column **Peak Output Current** is the intermittent peak current for a single module. For output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(2)</sup> Three module heatsink types, L-Bracket (LB), Short Fin (SF), and Long Fin (LF) are available depending on the input voltage and output current. There are 4 standard categories for ambient operating temperature and current derating denoted by the number following the heatsink type. All categories require forced air cooling.

Category 1: 0 to 60 °C without derating. Derate current 10% per °C over 60 °C.

Category 2: 0 to 50 °C without derating. Derate current 5% per °C over 50 °C.

Category 3: 0 to 40 °C without derating. Derate current 3% per °C over 40 °C.

Category 4: 0 to 30 °C without derating. Derate current 2.5% per °C over 30 °C.

Special: Contact Glentek for models with a lower operating temperature limit of -40 °C.

<sup>(3)</sup> Model Codes are used on [pg. 18](#) for model numbering

<sup>(4)</sup> UL Recognized Components are available as an option for the DC bus power supply (rectifier) assembly. For input voltages of 110-240 VAC the maximum input current is 33 A<sub>RMS</sub>. For input voltages of 360-500 VAC the maximum input current is 16 A<sub>RMS</sub>.

<sup>(5)</sup> Bus power logic (SMB models) not available for input voltages of greater than 360 VAC.

# DC BUS POWER SUPPLY (RECTIFIER) ASSEMBLIES

## Electrical Ratings for use with SMB/SMC9GE15 Gamma Series Drives

Input Voltage		Output Current, per axis <sup>(1)</sup>			Max. No. of Axes	Module Heatsink Type (Derating Factor) <sup>(2)</sup>
VAC	Model Code <sup>(3)</sup>	Cont. A (A <sub>RMS</sub> )	Peak A (A <sub>RMS</sub> )	Model Code <sup>(3)</sup>		
110-130	1	5 (3.5)	10 (7.1)	1	5	L-Bracket (1)
110-130	1	10 (7.1)	20 (14.1)	3	5	L-Bracket (1)
110-130	1	15 (10.6)	30 (21.2)	4	5	L-Bracket (2)
110-130	1	20 (14.1)	40 (28.3)	5	5	Short Fin (1)
110-130	1	25 (17.7)	50 (35.4)	6	5	Short Fin (2)
208-240	2	5 (3.5)	10 (7.1)	1	5	L-Bracket (1)
208-240	2	10 (7.1)	20 (14.1)	3	5	L-Bracket (2)
208-240	2	15 (10.6)	30 (21.2)	4	5	L-Bracket (3)
208-240	2	20 (14.1)	40 (28.3)	5	5	Short Fin (2)
208-240	2	25 (17.7)	50 (35.4)	6	5	Short Fin (3)
360-400	3	5 (3.5)	10 (7.1)	1	5	L-Bracket (2)
360-400	3	10 (7.1)	20 (14.1)	3	5	Short Fin (2)
360-400	3	15 (10.6)	30 (21.2)	4	5	Short Fin (3)
360-400	3	20 (14.1)	40 (28.3)	5	2	Long Fin (2)
360-400	3	25 (17.7)	50 (35.4)	6	2	Long Fin (3)

### Notes:

<sup>(1)</sup> The column Cont. Output Current is the continuous current and the column Peak Output Current is the intermittent peak current for a single module. For output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(2)</sup> Three module heatsink types, L-Bracket (LB), Short Fin (SF), and Long Fin (LF) are available depending on the input voltage and output current. There are 4 standard categories for ambient operating temperature and current derating denoted by the number following the heatsink type. All categories require forced air cooling.

Category 1: 0 to 60 °C without derating. Derate current 10% per °C over 60 °C.

Category 2: 0 to 50 °C without derating. Derate current 5% per °C over 50 °C.

Category 3: 0 to 40 °C without derating. Derate current 3% per °C over 40 °C.

Category 4: 0 to 30 °C without derating. Derate current 2.5% per °C over 30 °C.

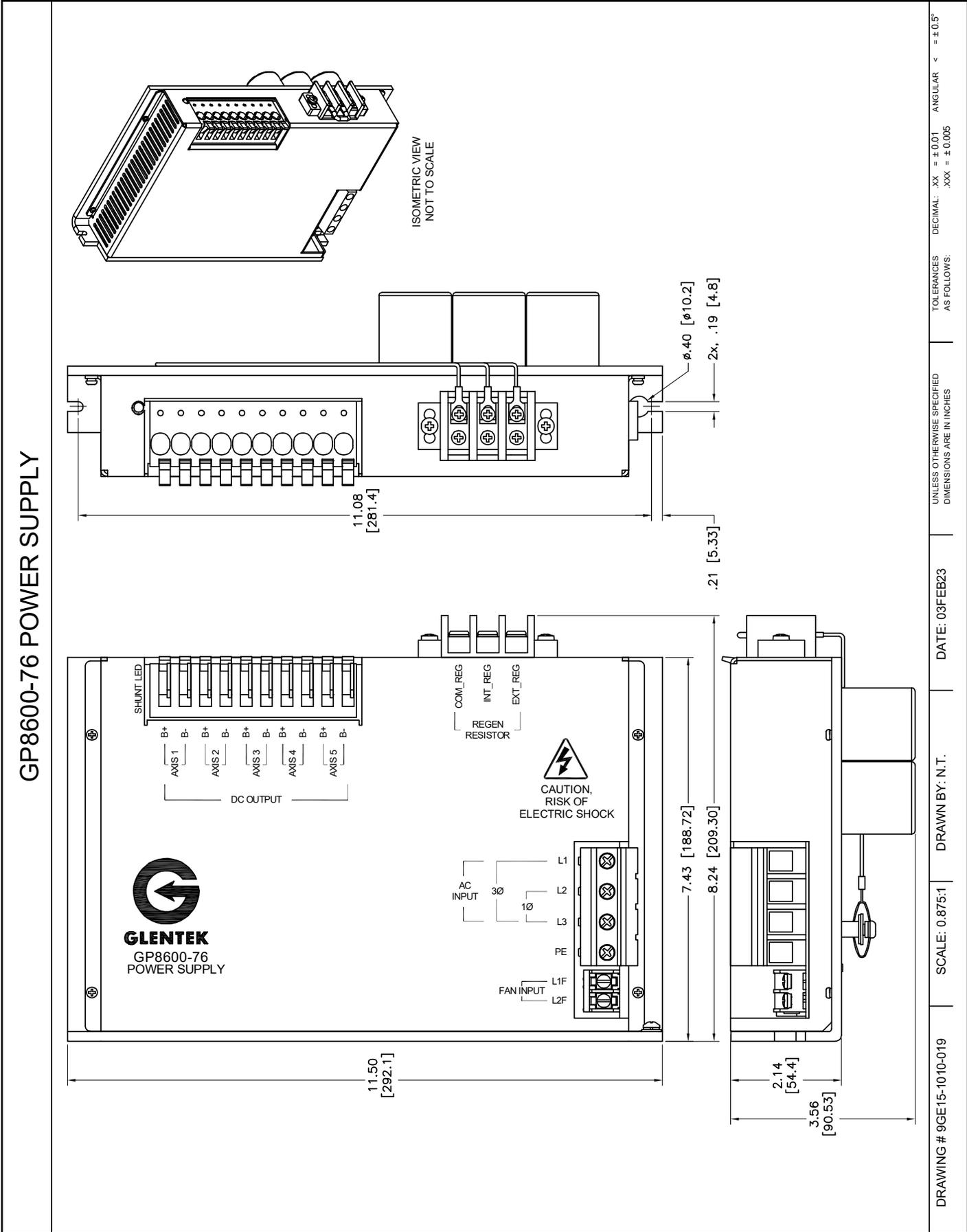
Special: Contact Glentek for models with a lower operating temperature limit of -40 °C.

<sup>(3)</sup> Model Codes are used on [pg. 18](#) for model numbering

<sup>(4)</sup> Bus power logic (SMB models) not available for input voltages of greater than 360 VAC.

# DC BUS POWER SUPPLY (RECTIFIER) ASSEMBLIES

## Dimensions



**SERVO DRIVES DC Bus Power Supply (Rectifier) Assemblies**

# ALPHA SERIES DIGITAL PWM SERVO DRIVES



Glentek's Alpha Series Digital PWM Servo Drives offer high performance DSP control of brushless (standard servo and high-speed spindle), brush type, rotary, linear, voice coil and AC induction motors. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. These drives incorporate Field Oriented Control (FOC) and Space Vector Modulation (SVM) algorithms which provide optimum control that enable motors to run cooler and at higher velocities. Set-up, tuning and system diagnostics is accomplished using MotionMaestro (Glentek's Windows-based software). There are four versions of this drive available, SMx92xx, SMx94xx, SMx9515, and SMx9A15 (x's are model number placeholders). Refer to the selection table below to select the version that best suits your application.

Command/Control Modes	SMx92xx	SMx94xx	SMx9515	SMx9A15
+/-10 VDC typical for current (torque) or velocity (RPM)	•	•	•	•
Pulse (step) and direction	•	•	•	
Encoder follower	•	•	•	
External sine commutation (2-phase current mode)	•	•	•	
RS-232 or RS-485	•	•	•	•
PWM for current (torque) or velocity (RPM)	•	•	•	•
Camming/Gearing	•	•	•	
<b>Feedback</b>				
Incremental (TTL) quadrature encoder	•	•	•	•
Digital Hall sensors or commutation tracks from encoder	•	•	•	•
Resolver	•			
Analog tachometer	•	•	•	
<b>Logic Power</b>				
Bus Power Logic	•	•	•	•
24 VDC External Logic Power, Keep Alive	•	•	•	
5 VDC External Logic Power, Keep Alive			•	•
<b>Available Package Configurations</b>				
Stand Alone	•	•		
Module	•	•	•	•
Multi-Axis	•	•	•	•
<b>I/O</b>				
Dedicated I/O: Analog signal command, +/- limits, inhibit/enable, fault, reset, motor temp, encoder and step & direction				
Programmable analog out: 1 12-bit or optional 2 16-bit				
General purpose relay: maximum 2 amps @ 30 VDC. Nais P/N: TQSA-5V				
<b>Environmental Conditions</b>				
Storage Temperature: -40°C to 80°C				
Ambient Operating Standard: 0°C to 25°C without derating, for 25°C to 50°C derate current 2.5% per °C above 25°C				
Temperature: Special: -40°C to 25°C without derating, for 25°C to 50°C derate current 2.5% per °C above 25°C				
Humidity: 5% to 95% relative humidity, non-condensing				
Altitude: Up to 1000m without derating, derate current 10% per 1000m above 1000m				

<b>Performance</b>	
<b>FOC</b>	All Alpha Series employ Field Oriented Control method which allows accurate control in both steady state or transient operation, and optimal orientation of the magnetic field.
<b>Space Vector Modulation</b>	Glentek's advanced algorithms allow for maximum utilization of the DC bus voltage while generating minimum harmonic distortion of the currents in the winding of 3-phase AC motor.
<b>Digital current loops</b>	Current loop bandwidths up to 3 kHz.
<b>Digitally tuned</b>	All parameters set digitally. No potentiometers to adjust. DSP control for the ultimate in high performance.
<b>Parametric filtering</b>	Provides control engineers advanced filtering to eliminate unwanted system mechanical resonance.
<b>Smart-Comm Initialization</b>	Eliminates the need for Hall sensor or commutation tracks for many applications.
<b>Auto Phase Advance</b>	Plug and Play for all types of three phase brushless motors. Provides control engineers the ability to connect any motor to the drive's motor outputs. The drives smart algorithm will automatically find and align the motor phases to allow for the most optimized smoothness and efficient commutation.
<b>Sinusoidal commutation</b>	For the ultimate in efficiency and smooth motion, commutates from almost any resolution linear, rotary encoder, or Hall sensors only.
<b>Fault protection</b>	Short from output to output, short from output to ground, drive RMS over current, drive under/over voltage, drive over temperature, motor over temperature.
<b>On-the-fly mode switching</b>	This feature allows the drive to switch between any mode of operation on-the-fly. That is, the drive can switch between current to velocity (or velocity to current), current to position (or position to current), and velocity to position (or position to velocity) while the motor is in motion. This feature is available upon request. Please contact Glentek application engineers for assistance.
<b>Software configurable</b>	Glentek's Windows™ based MotionMaestro© software provides ease of set-up, monitoring and tuning with no previous programming experience required. This software is Windows™ 95/98/2000/XP, NT, Vista, 7, and 8 compatible.
<b>Silent operation</b>	25 kHz PWM standard.
<b>Command/control Modes</b>	+/-10V for current (torque) or velocity (RPM), pulse (step) and direction, encoder follower, external sine commutation (2-phase current mode), RS-232, RS-485, PWM for current (torque or velocity (RPM), and camming/gearing.
<b>Regulatory</b>	
<b>CE marked</b>	All servo drives are CE marked in accordance with EN60204-1 (IEC204-1).
<b>RoHS compliant</b>	RoHS compliance optional.
<b>Connectivity</b>	
<b>RS-232 or RS-485</b>	High speed (115.2K baud) serial communication interface for setup and tuning and diagnostics. Note: RS-485 is optional.
<b>Feedback</b>	
<b>Encoder feedback</b>	Accepts nominal encoder signals up to 5 MHz (maximum frequency of up to 10 MHz is possible, but is system dependent).
<b>Resolver feedback</b>	Accepts analog signals from all types of resolver feedback. Note: SMx92xx models only.
<b>Tachometer feedback</b>	Accepts analog signals from all types of tachometer feedback.
<b>I/O</b>	
<b>Dedicated I/O</b>	Analog signal command, +/- limits, inhibit/enable, fault, reset, motor temp, encoder and step & direction. Programmable analog out: 1 12-bit or optional 2 16-bit. General purpose relay: maximum 2 amps @ 30 VDC. Nais P/N: TQSA-5V.
<b>Input</b>	
<b>Wide operating voltage</b>	24-340 VDC for drive modules. All stand-alone and multi axis versions can be ordered for operation from either 110-130 VAC or 208-240 VAC (single or 3-phase, 50/60 Hz). Note: Non-standard input voltages available on request.
<b>Direct AC operation</b>	The stand-alone units and multi-axis chassis include DC bus power supplies, cooling fans and a regen clamp with dissipation resistor. Note: SMX9415-1D-1 Stand Alone does not have a regen clamp.
<b>External logic supply</b>	24-48 VDC, 600mA min @ 24 VDC powers all logic & encoder. This works as a "keep alive" for the SMC9415 drives.
<b>Build</b>	
<b>Complete isolation</b>	Complete isolation between signal and power stage.
<b>Non-volatile memory</b>	All parameters are stored in non-volatile memory for reliable start up. In addition, up to four different configurations can be stored in the drive's non-volatile memory.
<b>Relay outputs</b>	Two pins provide an interface for the relay. They turn on when a desired condition occurs.
<b>Status indicator</b>	7-segment display indicates drive status and diagnostics.
<b>SMT construction</b>	Provides ultra compact size, cost competitive package and high reliability.

# ALPHA SERIES ELECTRICAL RATINGS

Model Number <sup>(1)</sup>	Power Rating	Input Voltage		Output Current <sup>(2)</sup>		Available Package Configurations		
		VDC	VAC	Cont. A (A <sub>RMS</sub> )	Peak A (A <sub>RMS</sub> )	Module	Stand Alone	Multi-Axis
SMx9208 SMx9408	Standard	-	110-130	4 (2.8)	8 (5.7)		•	
	High	-	110-130	8 (5.7) <sup>(3)</sup>	16 (11.3) <sup>(3)</sup>			
SMx9210 SMx9410	Standard	-	110-130	5 (3.5)	10 (7.1)		•	
		-	208-240					
	High	-	110-130	10 (7.1) <sup>(3)</sup>	20 (14.1) <sup>(3)</sup>			
		-	208-240					
SMx9215 SMx9415 SMx9515 SMx9A15	Low	24-70	-	10 (7.1)	20 (14.1)	•	(SMx9215 and SMx9415 only)	•
		70-190	110-130					
		190-370	208-240					
	Standard	24-70	-	15 (10.6)	30 (21.2)			
		70-190	110-130					
		190-370	208-240					
	High	24-70	-	20 (14.1)	40 (28.3)			
		70-190	110-130					
		190-370	208-240					
SMx9225 SMx9425	Standard	-	110-130	25 (17.7)	50 (35.4)		•	
		-	208-240					
SMx9230 SMx9430	Standard	-	110-130	30 (21.2)	60 (42.4)		•	
		-	208-240					
SMx9245 SMx9445	Standard	-	110-130	45 (31.8)	80 (56.6)		•	
		-	208-240					
SMx9275 SMx9475	Standard	-	110-130	75 (53.0)	120 (84.9)		•	
		-	208-240					

**Notes:**

<sup>(1)</sup> x = B, C, or D and represents the on-board or external bus logic option. Refer to model numbering on [pgs. 26-29](#) for more information.

<sup>(2)</sup> The column Cont. Output Current is the continuous current and the column Peak Output Current Peak is the intermittent peak current. For output current ratings in brushless mode, ratings for each model are listed as peak of the sine wave phase current values followed by the equivalent RMS phase current values (in parentheses). In brush or voicecoil mode, A is the current, and the RMS values (in parentheses) can be ignored. All output current ratings are for three-phase VAC inputs or VDC inputs. If a single-phase VAC input is used, the total output current for all axes is limited to a maximum of 15 A cont. / 30 A peak.

<sup>(3)</sup> Forced air cooling required.

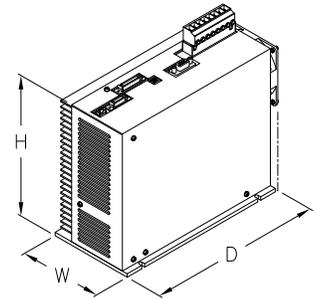
Non-standard input voltages available upon request.

# ALPHA SERIES DIMENSIONS

## Stand Alone

This package consists of a drive module, DC bus power supply, regen clamp with dissipation resistor, in-rush current limiting protection at power-on, fuses and optional cooling fans. Refer to the stand alone package configuration in the model numbering on [pg. 26](#) for regen options.

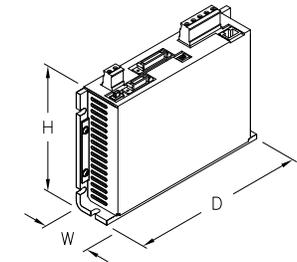
Model Number <sup>(1)</sup>	Regen Option	Dimensions, Inches (mm)			Weight lbs. (kg)	Fan
		Width	Height	Depth		
SMx9208, SMx9408	1A	2.9 (74)	5.5 (140)	6.5 (165)	2.3 (1.0)	No
	1F	4.0 (102)	5.5 (140)	6.5 (165)	2.7 (1.2)	
SMx9210, SMx9410	1D	3.1 (79)	4.8 (122)	7.2 (182)	2.5 (1.1)	No
	1F	4.2 (106)	4.8 (122)	7.2 (182)	2.9 (1.3)	
SMx9215, SMx9415	1A	4.0 (102)	5.9 (149)	9.0 (229)	4.7 (2.1)	Yes
	1D	4.0 (102)	5.7 (145)	8.6 (218)	4.7 (2.1)	
SMx9225, SMx9425	1A	4.5 (114)	8.1 (206)	11.0 (279)	6.2 (2.8)	Yes
SMx9230, SMx9430	1B	5.3 (135)	9.3 (236)	12.5 (318)	11.0 (4.9)	Yes
SMx9245, SMx9445	1B	5.3 (135)	9.4 (239)	14.5 (368)	11.8 (5.4)	Yes
SMx9275, SMx9475	1B	5.9 (150)	12.5 (318)	17.6 (448)	25.5 (11.3)	Yes



## Module

This package consists of a drive module, without a DC bus power supply. This type of package is typically used for cost sensitive applications where the customer provides DC bus power supply, forced-air cooling and regen clamp or it can be integrated into a Glentek multi-axis package.

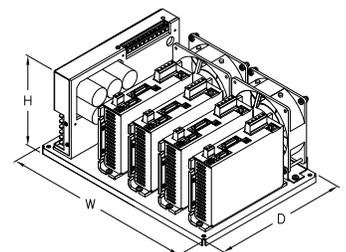
Model Number <sup>(1)</sup>	Cont. Current	Dimensions, Inches (mm)			Weight lbs. (kg)
		Width	Height	Depth	
SMx9215, SMx9415	10, 15	1.6 (41)	4.8 (123)	7.1 (181)	1.8 (.8)
	20	2.3 (59)	4.8 (123)	7.1 (181)	2.8 (1.3)
SMx9515	10, 15	2.0 (51)	6.7 (170)	8.0 (203)	2.1 (1.0)
	20	2.5 (63)	7.2 (183)	8.2 (208)	3.3 (1.5)
SMx9A15	10, 15	1.4 (35)	6.1 (155)	7.1 (181)	1.7 (.8)
	20	2.1 (53)	6.1 (155)	7.1 (181)	2.5 (1.1)



## Multi-Axis

This package consists of an open frame base plate chassis with DC bus power supply, regen clamp with dissipation resistor, in-rush current limiting protection at power-on, fuses and cooling fans. Available in 2, 4 & 5 axis packages. This type of package is typically used for multi-axis applications. The DC bus power supply has a continuous output current rating of 40 A total.

Model Number <sup>(1)</sup>	Axes	Cont. Current	Dimensions, Inches (mm)			Weight lbs. (kg)
			Width	Height	Depth	
SMx9215, SMx9415	2	10, 15	9.0 (229)	6.9 (176)	10.8 (273)	9.5 (4.3)
		20	9.8 (248)	6.9 (176)	10.8 (273)	11.5 (5.2)
	4	10, 15	13.0 (330)	6.9 (176)	10.8 (273)	15.1 (6.7)
		20	14.9 (378)	6.9 (176)	10.8 (273)	19.1 (8.7)
	5	10, 15	18.8 (476)	6.9 (176)	11.8 (298)	17.9 (8.1)
		20	18.8 (476)	6.9 (176)	11.8 (298)	22.9 (10.4)
SMx9515	2	10, 15	9.8 (249)	7.2 (183)	10.8 (273)	9.8 (4.4)
		20	9.8 (249)	7.7 (196)	10.8 (273)	12.5 (5.7)
	4	10, 15	13.0 (330)	7.2 (183)	10.8 (273)	16.3 (7.4)
		20	14.9 (378)	7.7 (196)	10.8 (273)	21.1 (9.6)
	5	10, 15	18.8 (476)	7.2 (183)	11.8 (298)	19.4 (8.8)
		20	18.8 (476)	7.7 (196)	11.8 (298)	25.4 (11.5)
SMx9A15	2	10, 15	9.8 (249)	7.2 (183)	10.8 (273)	9.8 (4.4)
		20	9.8 (249)	7.7 (196)	10.8 (273)	12.5 (5.7)
	4	10, 15	13.0 (330)	7.2 (183)	10.8 (273)	16.3 (7.4)
		20	14.9 (378)	7.7 (196)	10.8 (273)	21.1 (9.6)
	5	10, 15	18.8 (476)	7.2 (183)	11.8 (298)	19.4 (8.8)
		20	18.8 (476)	7.7 (196)	11.8 (298)	25.4 (11.5)



Note: <sup>(1)</sup> x = B (bus power logic), C (24 VDC external logic power), or D (5 VDC external logic power). Refer to model numbering on [pgs. 26–29](#) for more information.

# ALPHA SERIES STAND ALONE MODEL NUMBERING

This section explains the model numbering system for Glentek's Alpha Series Digital PWM Brushless Servo Drives. The model numbering system is designed so that you, our customer, will be able to quickly and accurately create the model number for the drive that best suits your requirements. **Please choose the model and package configuration you require from the "Electrical Ratings" table on pg. 24.** Then complete the drive configuration code you require using the information on this page. After completing your model number, please contact a Glentek Sales Engineer to confirm that the model number you have created is correct.



On-Board or External Bus Logic	
<b>B</b>	Bus Power Logic
<b>C</b>	24 VDC External Logic Power, Keep Alive

Drive Model			
<b>2</b>	Resolver-Based <sup>(2)</sup>	<b>4</b>	Encoder/Hall/Tach-Based

Continuous Current & Drive Power			
<b>08</b>	4 A (Standard Power) 8 A (High Power) <sup>(1)</sup>	<b>30</b>	30 A (Standard Power)
<b>10</b>	5 A (Standard Power) 10 A (High Power) <sup>(1)</sup> 10 A (Low Power)	<b>45</b>	45 A (Standard Power)
<b>15</b>	15 A (Standard Power) 20 A (High Power)	<b>75</b>	75 A (Standard Power)
<b>25</b>	25 A (Standard Power)	-	-

Note: <sup>(1)</sup> With external forced-air cooling.

Logic Power	
<b>0</b>	SMB (Bus Power Logic)
<b>1</b>	SMC (24 VDC External Logic Power, Keep Alive)

Input Voltage & Power Rating			
<b>00</b>	208-240 VAC, Standard Power	<b>03</b>	110-130 VAC, Standard Power
<b>01</b>	208-240 VAC, High Power	<b>04</b>	110-130 VAC, High Power
<b>02</b>	208-240 VAC, Low Power	<b>05</b>	110-130 VAC, Low Power

I/O & Motor Feedback Connectors			
<b>0</b>	High Density Mini-D <sup>(2)</sup>	<b>1</b>	Molex

Logic Board	
<b>01</b>	Standard Features, +/-10 VDC typical for current (torque) or velocity (RPM) <sup>(2)</sup>
<b>07</b>	Pulse Follower <sup>(2)</sup>
<b>09</b>	External Sine Commutation / 2 Phase Current Mode
<b>11</b>	Brush Type (Current Mode) / Brush Type with Encoder (Current or Velocity Mode)
<b>13</b>	Brush Type with Tachometer (Current or Velocity Mode)

Host Connector			
<b>1</b>	RJ45 (Default, Leave Blank) <sup>(2)</sup>	<b>2</b>	2 RJ45 (for Multi-Drop)
<b>D</b>		<b>D</b>	DB9 <sup>(2)</sup>

Stand Alone Package Configuration	
<b>A</b>	9215/9415 & 9225/9425 Stand Alone with Built In Regen Clamp with Dissipation Resistor 9208/9408 Stand Alone with No Built In Regen Clamp
<b>B</b>	9230/9430, 9245/9445, & 9275/9475 Stand Alone with Built In Regen Clamp with Dissipation Resistor
<b>D</b>	9210/9410 & 9215/9415 Stand Alone with No Built In Regen Clamp
<b>F</b>	9208/9408, 9210/9410 Stand Alone with Built In Regen Clamp and without Dissipation Resistor

**Notes:**

<sup>(1)</sup> With external forced-air cooling.

<sup>(2)</sup> Resolver-based drives may only use these options.

# ALPHA SERIES MODULE MODEL NUMBERING

**SMx9215:** Pick this model if you will use resolver feedback. This drive uses High Density Mini-D connectors for I/O and motor feedback.



On-Board or External Bus Logic	
<b>B</b>	<b>0</b> Bus Power Logic
<b>C</b>	<b>1</b> 24 VDC External Logic Power, Keep Alive

Input Voltage & Continuous Current Rating			
<b>00</b>	190-370 VDC, 15 A	<b>03</b>	70-190 VDC, 15 A
<b>01</b>	190-370 VDC, 20 A	<b>04</b>	70-190 VDC, 20 A
<b>02</b>	190-370 VDC, 10 A	<b>05</b>	70-190 VDC, 10 A
<b>06</b>	24-70 VDC, 15 A	<b>07</b>	24-70 VDC, 20 A
<b>08</b>	24-70 VDC, 10 A		

I/O & Motor Feedback Connectors	
<b>0</b>	High Density Mini-D

Logic Board	
<b>01</b>	Standard Features, +/-10 VDC typical for current (torque) or velocity (RPM)
<b>07</b>	Pulse Follower

Host Connector	
<b>D</b>	1 RJ45 (Default, Leave Blank) DB9

**SMx9415:** Pick this model if you will use encoder, Hall, and/or tachometer feedback. The main difference between this model and the 9515 is physical size. This model is smaller.



On-Board or External Bus Logic	
<b>B</b>	<b>0</b> Bus Power Logic
<b>C</b>	<b>1</b> 24 VDC External Logic Power, Keep Alive

Input Voltage & Continuous Current Rating			
<b>00</b>	190-370 VDC, 15 A	<b>03</b>	70-190 VDC, 15 A
<b>01</b>	190-370 VDC, 20 A	<b>04</b>	70-190 VDC, 20 A
<b>02</b>	190-370 VDC, 10 A	<b>05</b>	70-190 VDC, 10 A
<b>06</b>	24-70 VDC, 15 A	<b>07</b>	24-70 VDC, 20 A
<b>08</b>	24-70 VDC, 10 A		

I/O & Motor Feedback Connectors			
<b>0</b>	High Density Mini-D	<b>1</b>	Molex (2 Double-Row)

Logic Board	
<b>01</b>	Standard Features, +/-10 VDC typical for current (torque) or velocity (RPM)
<b>07</b>	Pulse Follower
<b>09</b>	External Sine Commutation / 2 Phase Current Mode
<b>11</b>	Brush Type (Current Mode) / Brush Type with Encoder (Current or Velocity Mode)
<b>13</b>	Brush Type with Tachometer (Current or Velocity Mode)

Host Connector	
<b>2</b>	1 RJ45 (Default, Leave Blank) DB9
	2 RJ45 (for Multi-Drop) - -

**Note:** The DB9 host connector option requires High Density Mini-D I/O & motor feedback connectors.  
 The 2 RJ45 host connector option requires Molex I/O & motor feedback connectors.  
 The 1 RJ45 host connector option can use either I/O & motor feedback connector options.

# ALPHA SERIES MODULE MODEL NUMBERING

**SMx9515:** Pick this model if you will use encoder, Hall, and/or tachometer feedback. The main difference between this model and the 9415 is physical size. This model is larger.



On-Board or External Bus Logic	
<b>B</b>	<b>0</b> Bus Power Logic
<b>C</b>	<b>1</b> 24 VDC External Logic Power, Keep Alive
<b>D</b>	<b>2</b> 5 VDC External Logic Power, Keep Alive

Input Voltage & Continuous Current Rating					
<b>00</b>	190-370 VDC, 15 A	<b>03</b>	70-190 VDC, 15 A	<b>06</b>	24-70 VDC, 15 A
<b>01</b>	190-370 VDC, 20 A	<b>04</b>	70-190 VDC, 20 A	<b>07</b>	24-70 VDC, 20 A
<b>02</b>	190-370 VDC, 10 A	<b>05</b>	70-190 VDC, 10 A	<b>08</b>	24-70 VDC, 10 A

I/O & Motor Feedback Connectors	
<b>1</b>	Molex (2 Double-Row)

Logic Board	
<b>01</b>	Standard Features, +/-10 VDC typical for current (torque) or velocity (RPM)
<b>07</b>	Pulse Follower
<b>09</b>	External Sine Commutation / 2 Phase Current Mode
<b>11</b>	Brush Type (Current Mode) / Brush Type with Encoder (Current or Velocity Mode)
<b>13</b>	Brush Type with Tachometer (Current or Velocity Mode)

Host Connector	
	1 RJ45 (Default, Leave Blank)
<b>2</b>	2 RJ45 (for Multi-Drop)

**SMx9A15:** Pick this model if you will use encoder and/or Hall feedback. This model has fewer logic boards options than the SMx9415 or SMx9515.



On-Board or External Bus Logic	
<b>B</b>	<b>0</b> Bus Power Logic
<b>D</b>	<b>2</b> 5 VDC External Logic Power, Keep Alive

Input Voltage & Current Rating					
<b>00</b>	190-370 VDC, 15 A	<b>03</b>	70-190 VDC, 15 A	<b>06</b>	24-70 VDC, 15 A
<b>01</b>	190-370 VDC, 20 A	<b>04</b>	70-190 VDC, 20 A	<b>07</b>	24-70 VDC, 20 A
<b>02</b>	190-370 VDC, 10 A	<b>05</b>	70-190 VDC, 10 A	<b>08</b>	24-70 VDC, 10 A

I/O & Motor Feedback Connectors	
<b>2</b>	Molex (1 Double-Row & 1 Single-Row)

Logic Board	
<b>01</b>	Standard Features, +/-10 VDC typical for current (torque) or velocity (RPM)
<b>11</b>	Brush Type and Encoder

Host Connector	
	1 RJ45 (Default, Leave Blank)
<b>2</b>	2 RJ45 (for Multi-Drop)
<b>M</b>	Molex

# ALPHA SERIES MULTI-AXIS MODEL NUMBERING



On-Board or External Bus Logic	↑
Drive Model (2, 4, 5, or A)	↑
Logic Power	↑
Input Voltage & Continuous Current Rating	↑
I/O & Motor Feedback Connectors	↑
Logic Board	↑
Host Connector	↑

For all of the options above, refer to the module model numbering on [pgs. 27-28](#). Multi-axis packages operate from either 110-130 VAC (70-190 VDC for modules) or 208-240 VAC (190-370 VDC for modules).

Mounting Configuration			
<b>2B</b>	2-Axis Chassis	<b>5B</b>	5-Axis Chassis
<b>4B</b>	4-Axis Chassis	-	-

Number of Drive Modules Installed			
<b>1</b>	1 Drive Module (2-Axis Chassis)	<b>4</b>	4 Drive Modules (4-Axis Chassis)
<b>2</b>	2 Drive Modules (2-Axis Chassis)	<b>5</b>	5 Drive Modules (5-Axis Chassis)
<b>3</b>	3 Drive Modules (4-Axis Chassis)	-	-

Fan Voltage			
<b>1</b>	115 VAC	<b>2</b>	230 VAC

**Note:** Restrictions may apply to on-board or external bus logic, drive model, logic power, I/O and motor feedback connectors, logic board, and host connector. Refer to module model numbering for details.

# ANALOG BRUSH PWM SERVO DRIVES

Glentek's Analog Brush PWM Servo Drives offer high performance analog control of brush type rotary and voice coil motors. Both AC powered (stand alone and multi-axis) and DC powered (module) packages are available. Glentek has been designing and producing analog brush PWM servo drives for over 40 years and continually updates each product as advances in technology become available so that customers are assured of optimal performance and reliability. These drives offer a cost effective, simple (tuning is accomplished by the adjustment of potentiometers), and high performance solution.

Command	
	+/-10 VDC for current (torque)
	+/-10 VDC for velocity (RPM)
Feedback	
	Analog tachometer (required for velocity control)
Dedicated Inputs	
	Single-ended or differential signal command, tachometer, +/- limits, inhibit/enable, fault, reset
	Motor temperature and master slave (SMB7200 series only)
Dedicated Outputs	
	Motor current, fault, low-speed electronic circuit breaker, high-speed electronic circuit breaker, over-voltage, and over-temperature

Features	
<b>RoHS compliant</b>	RoHS compliance optional.
<b>Dual signal inputs</b>	One single-ended and one differential. Both inputs may be used simultaneously. Both have up to 15,000A/V gain (velocity mode), and inputs will accept the typical $\pm 10$ VDC analog signal.
<b>Ergonomic design</b>	Easy access to connections, adjustments, and test points.
<b>Silent operation</b>	18 kHz PWM standard.
<b>Wide operating voltage</b>	30-220 VDC for SMA7110 and SMA7115 drive modules. All stand alone and multi axis versions can be ordered for operation from either 110-130 VAC (single or 3-phase, 50/60 Hz). 60-120 VAC for all SMB7200 series drives. Note: A separate 120 VAC source is required to power cooling fans for stand alone and multi-axis chassis.
<b>Direct AC operation</b>	The stand alone units and multi axis chassis include DC bus power supplies, cooling fans, and a regen clamp with dissipation resistor.
<b>Tri-mode operation</b>	Can be configured for current (torque), velocity (RPM) or voltage mode with IR compensation.
<b>Voltage mode with IR compensation</b>	This mode uses a pseudo-velocity loop. The drive estimates the motor velocity using the motor parameters and internal measurements. It is not as accurate as a true closed velocity loop with tachometer feedback, but it provides a great low cost alternative for less demanding applications. Note: SMA7115 only.
<b>Current limit</b>	Peak motor current is adjustable.
<b>+/- Limits &amp; Inhibit</b>	Three separate logic inputs can stop the motor in either or both directions. Inputs may be configured for active-high or active-low, pull-up or pull down termination, and a 0 to +5 VDC or 0 to +15 VDC range.
<b>Fault input/output</b>	Open-collector output goes low in the event of a fault. Forcing the fault terminal low will inhibit the drive. The fault terminals outputs in a multi-axis system may be connected together to shut down all drives should any drive have a fault.
<b>Short circuit protection</b>	Complete short circuit and ground fault protection.
<b>Tachometer</b>	Required for velocity feedback.
<b>Frequency response</b>	2 kHz minimum for current loop and 750 Hertz minimum for velocity loop.
<b>LED diagnostics</b>	Displays various faults and operating conditions.
<b>External fault reset</b>	Can reset drive externally in the event of a fault condition.
<b>Complete isolation</b>	Complete optical isolation between signal and power stage.
<b>Fault protection</b>	Short from output to output, short from output to ground, drive RMS over current, drive under/over voltage, and drive over temperature.
<b>SMT construction</b>	Provides ultra compact size, cost competitive package and high reliability.
<b>CE marked</b>	All servo drives are CE marked in accordance with EN60204-1 (IEC204-1).

Environmental Conditions	
<b>Storage Temperature</b>	-40°C to 80°C
<b>Operating Temperature</b>	Standard: 0°C to 40°C without current derating, up to 50°C with 25% current derating Special: -40°C to 40°C without current derating, up to 50°C with 25% current derating
<b>Humidity</b>	5% to 95% relative humidity, non-condensing
<b>Altitude</b>	Up to 1000m without derating, derate current 10% per 1000m above 1000m

# ANALOG BRUSH PWM ELECTRICAL RATINGS

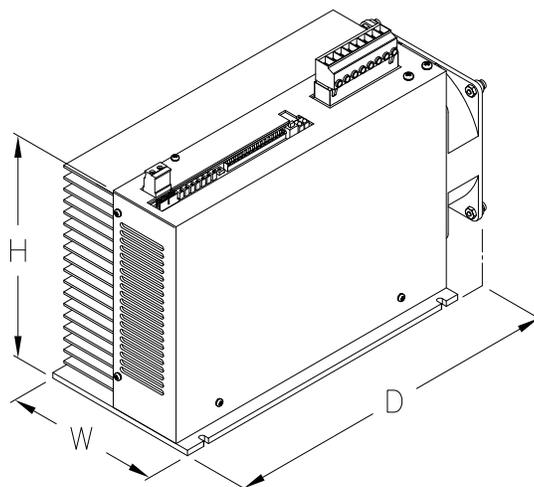
Model Number	Input Voltage		Continuous Current (A)	Peak Current (A)	Available Packaging Configurations		
	VDC	VAC			Module	Stand Alone	Multi Axis
<b>SMA7110LP</b>	30-220	N/A	6	12	•		•
<b>SMA7110</b>	30-220	N/A	10	20	•		•
<b>SMA7115</b>	30-220	110-130	15	25	•	•	•
<b>SMA7115HP</b>	30-220	110-130	20	40	•	•	•
<b>SMB7230</b>	N/A	60-120	30	60		•	
<b>SMB7245</b>	N/A	60-120	45	80		•	
<b>SMB7275</b>	N/A	60-120	75	120		•	
<b>SMB72100</b>	N/A	60-120	100	120		•	

## ANALOG BRUSH PWM DIMENSIONS

### Stand Alone

This package consists of an drive module, DC bus power supply, regen clamp with dissipation resistor, in-rush current limiting protection at power-on, fuses and one or more cooling fans. This type of package is typically used for one or multi-axis applications.

Model Number	Dimensions, Inches (mm)			Weight lbs. (kg)
	Width	Height	Depth	
<b>SMA7115-1A-1</b>	4.0 (102)	5.0 (126)	9.0 (229)	5.3 (2.4)
<b>SMB7230-1A-1</b>	5.3 (135)	9.4 (239)	12.5 (318)	11.0 (4.9)
<b>SMB7245-1A-1</b>	5.3 (135)	12.5 (318)	14.5 (368)	11.8 (5.4)
<b>SMB7275-1A-1</b>	5.9 (150)	12.5 (318)	17.6 (448)	25.5 (11.3)
<b>SMB72100-1A-1</b>	5.9 (150)	12.6 (320)	17.6 (448)	25.5 (11.3)

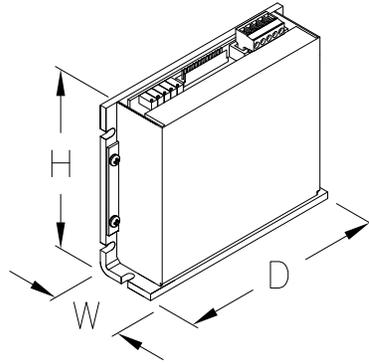


# ANALOG BRUSH PWM DIMENSIONS

## Module

This package consists of a drive module, without a DC bus power supply. This type of package is typically used for cost sensitive applications where the customer provides DC bus power supply, forced-air cooling and regen clamp.

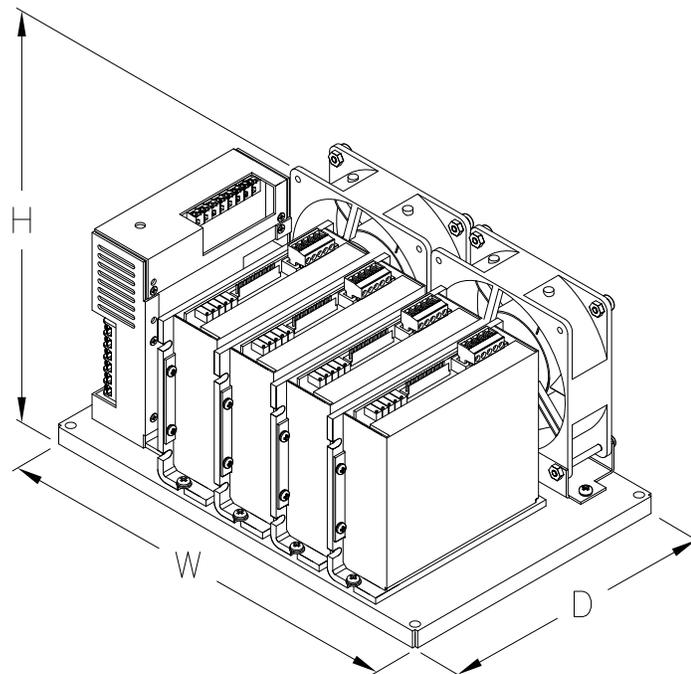
Model Number	Dimensions, Inches (mm)			Weight lbs. (kg)
	Width	Height	Depth	
<b>SMA7110-1</b>	1.4 (35)	4.5 (116)	5.1 (130)	0.9 (.4)
<b>SMA7115-1</b>	1.4 (35)	4.7 (120)	7.1 (181)	1.3 (.6)



## Multi-Axis

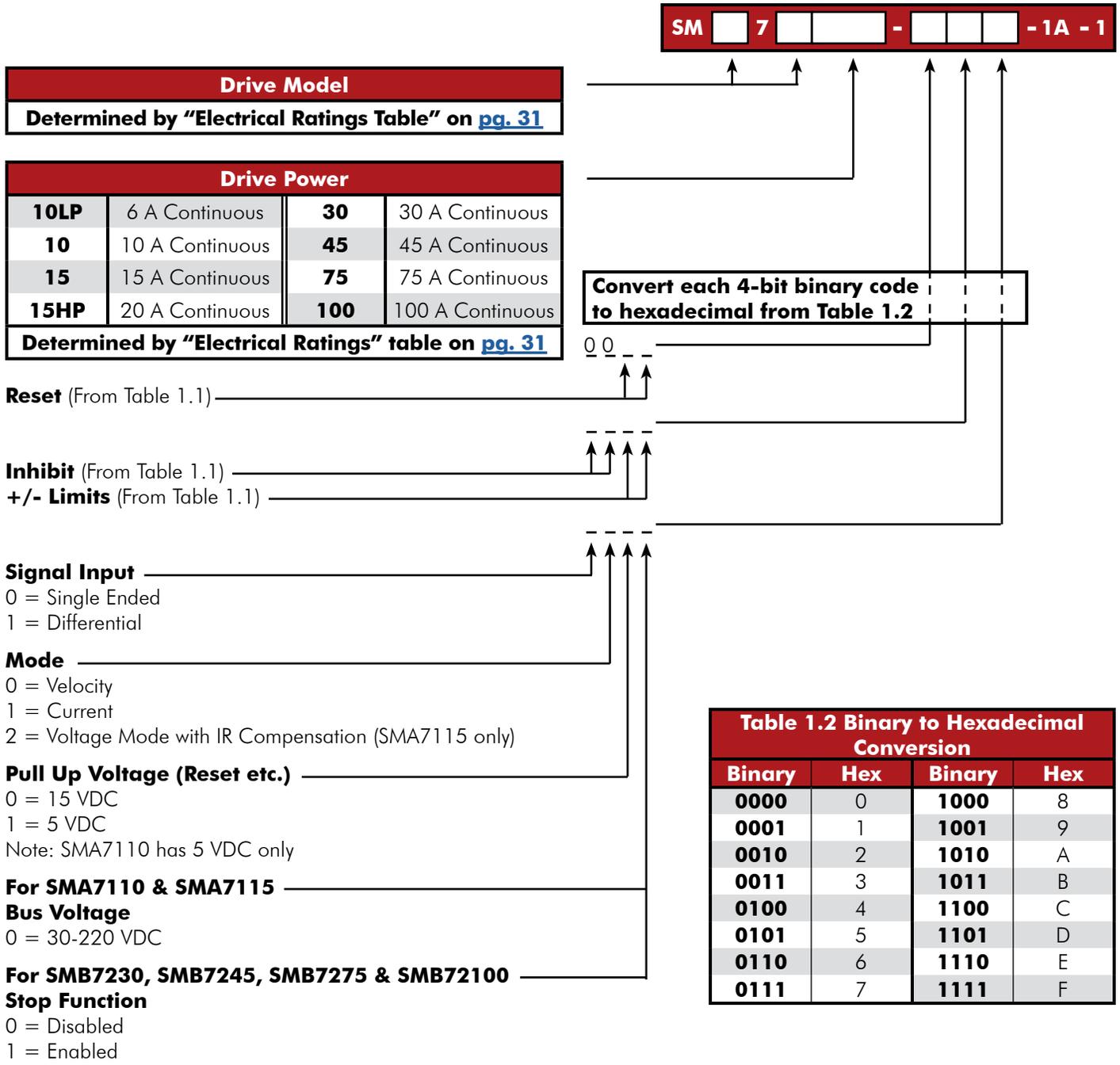
This package consists of an open frame base plate chassis with DC bus power supply, regen clamp with dissipation resistor, in-rush current limiting protection at power-on, fuses and cooling fans. Available in 2 & 4 axis packages. This type of package is typically used for multi-axis applications.

Model Number	Axes	Dimensions, Inches (mm)			Weight lbs. (kg)
		Width	Height	Depth	
<b>SMA7110-2A-2</b>	<b>2</b>	7.25 (184)	6.0 (152)	7.5 (191)	6.0 (2.7)
<b>SMA7110-4A-4</b>	<b>4</b>	11.0 (279)	6.0 (152)	7.5 (191)	9.0 (4.1)
<b>SMA7115-2A-2</b>	<b>2</b>	9.0 (229)	6.93 (176)	10.75 (273)	8.5 (3.9)
<b>SMA7115-4A-4</b>	<b>4</b>	13.0 (330)	6.93 (176)	10.75 (273)	13.3 (6.0)



# ANALOG BRUSH PWM STAND ALONE MODEL NUMBERING

This section explains the model numbering system for Glentek's Analog Brush PWM servo drives. The model numbering system is designed so that you, our customer, will be able to create the model number for the drive that best suits your needs. **In order to accurately select a complete model number, please choose the model and package configuration you require from the "Electrical Ratings" table on pg. 31.** Then complete the drive configuration code you require using the information on this page. After completing your model number, be sure to contact a Glentek Sales Engineer to confirm that the model number you have created is correct.



**Table 1.1 Function Configuration (Inhibit, Reset, +/- Limits)**

Binary	Input is:	Input State is:	Function Input Configuration
00	Internally Pulled Up	Active When Low	Requires grounding of input to activate the function
01	Internally Pulled Up	Active When High	Requires grounding of input to deactivate the function
10	Internally Pulled Down	Active When Low	Requires a positive voltage at input to deactivate the function
11	Internally Pulled Down	Active When High	Requires a positive voltage at input to activate the function

**Example:** Function: Reset, Binary Code: **00**. The default state of the input is high, because the input is internally pulled up. Because the function (reset) is active when low, the function (reset) will not be activated. Activating the function (reset) requires grounding the input (externally pulling it down to low).

# ANALOG BRUSH PWM MODULE MODEL NUMBERING



Drive Power	
10LP	6 A Continuous
10	10 A Continuous
15	15 A Continuous
15HP	20 A Continuous

Determined by "Electrical Ratings" table on [pg. 31](#)

**Reset** (From Table 1.1)

**Inhibit** (From Table 1.1)

**+/- Limits** (From Table 1.1)

**Signal Input**

- 0 = Single Ended
- 1 = Differential

**Mode**

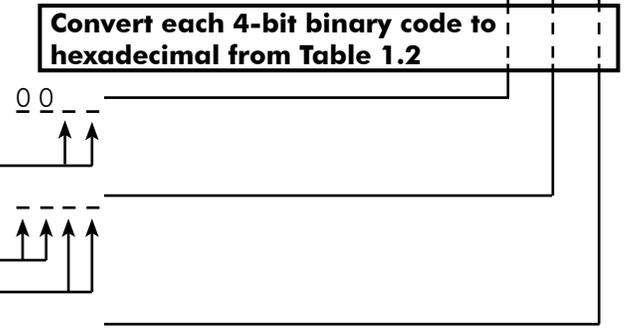
- 0 = Velocity
- 1 = Current
- 2 = Voltage Mode with IR Compensation (SMA7115 only)

**Pull Up Voltage (Reset etc.)**

- 0 = 15 VDC
  - 1 = 5 VDC
- Note: SMA7110 has 5 VDC only

**Bus Voltage**

- 0 = 30-220 VDC

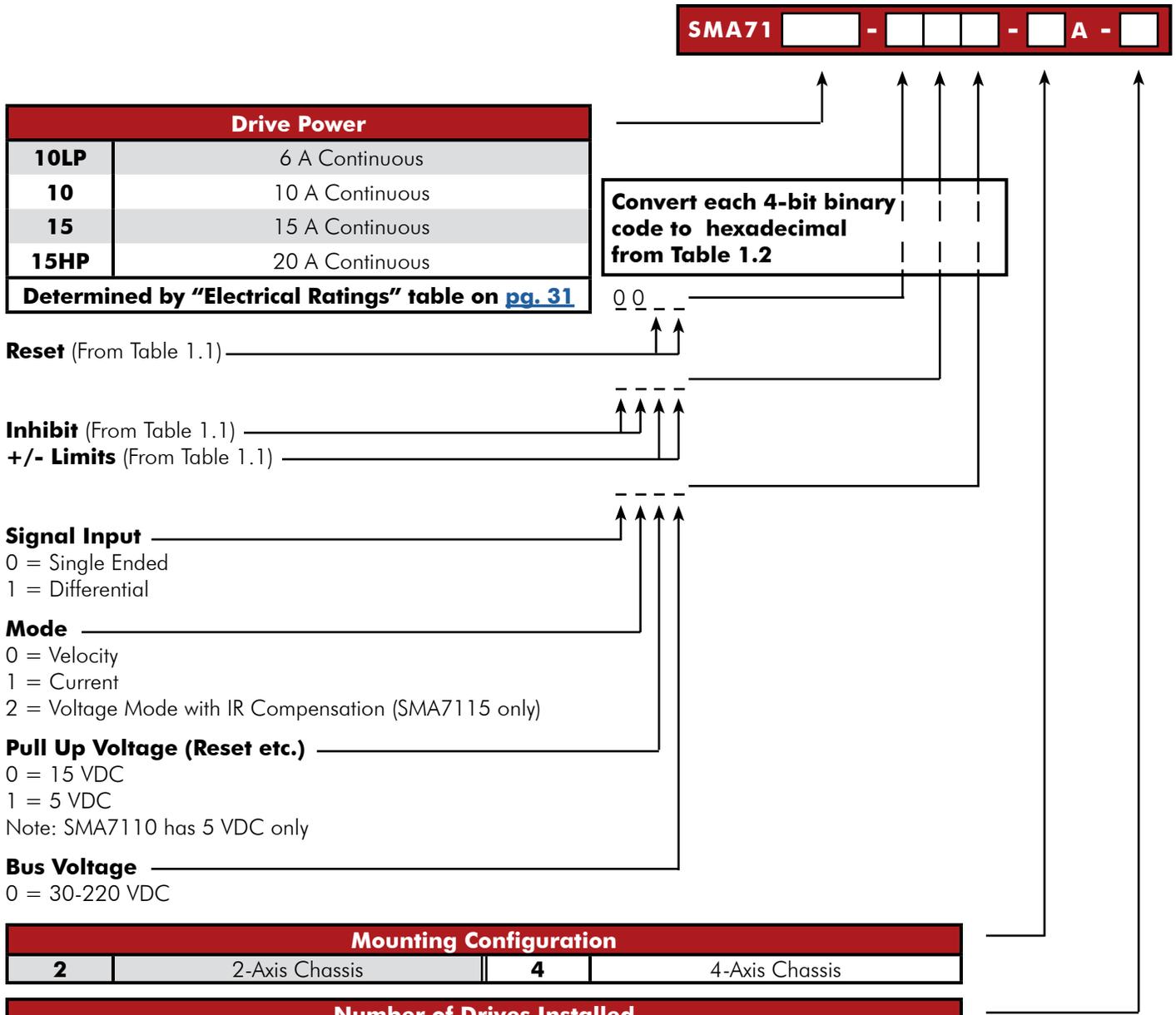


Binary	Input is:	Input State is:	Function Input Configuration
00	Internally Pulled Up	Active When Low	Requires grounding of input to activate the function
01	Internally Pulled Up	Active When High	Requires grounding of input to deactivate the function
10	Internally Pulled Down	Active When Low	Requires a positive voltage at input to deactivate the function
11	Internally Pulled Down	Active When High	Requires a positive voltage at input to activate the function

**Example:** Function: Reset, Binary Code: **00**. The default state of the input is high, because the input is internally pulled up. Because the function (reset) is active when low, the function (reset) will not be activated. Activating the function (reset) requires grounding the input (externally pulling it down to low).

Binary	Hex	Binary	Hex	Binary	Hex	Binary	Hex
0000	0	0100	4	1000	8	1100	C
0001	1	0101	5	1001	9	1101	D
0010	2	0110	6	1010	A	1110	E
0011	3	0111	7	1011	B	1111	F

# ANALOG BRUSH PWM MULTI-AXIS MODEL NUMBERING



**Table 1.1 Function Configuration (Inhibit, Reset, +/- Limits)**

Binary	Input is:	Input State is:	Function Input Configuration
<b>00</b>	Internally Pulled Up	Active When Low	Requires grounding of input to activate the function
<b>01</b>	Internally Pulled Up	Active When High	Requires grounding of input to deactivate the function
<b>10</b>	Internally Pulled Down	Active When Low	Requires a positive voltage at input to deactivate the function
<b>11</b>	Internally Pulled Down	Active When High	Requires a positive voltage at input to activate the function

**Table 1.2 Binary to Hexadecimal Conversion**

Binary	Hex	Binary	Hex	Binary	Hex	Binary	Hex
<b>0000</b>	0	<b>0100</b>	4	<b>1000</b>	8	<b>1100</b>	C
<b>0001</b>	1	<b>0101</b>	5	<b>1001</b>	9	<b>1101</b>	D
<b>0010</b>	2	<b>0110</b>	6	<b>1010</b>	A	<b>1110</b>	E
<b>0011</b>	3	<b>0111</b>	7	<b>1011</b>	B	<b>1111</b>	F

# LINEAR BRUSHLESS SERVO DRIVES



Glentek's SMA6520 series linear servo drives provide the optimum solution for applications which require high current loop bandwidth, low radiated electrical noise, and zero crossover distortion. These drives incorporate our latest generation ISO-BIAS current sense technology, which results in one of the lowest drift linear drives on the market today. These drives are constructed using surface mount technology and incorporate the latest in heat transfer technology which make them one of the most powerful drives for a given form factor.

Typical applications which are ideal for the SMA6520 series linear drives include low inductance/resistance brushless motors (linear or rotary) and high resolution air bearing linear brushless motor stages.

The SMA6520 series is highly configurable and can operate in the following commutation modes:

Commutation Modes	
<b>External sine commutation (2-phase current mode) (-11 plug-in board)</b>	In this mode, the drive accepts two +/-10 VDC analog inputs as a current command reference for two of the motor phases. The third phase is derived within the drive from the two reference phases. This drive does not require any feedback devices and is used with controllers that provide the commutation.
<b>Trapezoidal commutation (-12 plug-in board)</b>	In this mode, the drive accepts a +/-10 VDC analog input as a current command reference and utilizes the Hall Sensors which are mounted on the motor for commutation of the motor in current (torque) mode.
<b>Encoder-based sinusoidal commutation (-24 plug-in board)</b>	In this mode, the drive accepts a +/-10 VDC analog input as a current (torque) or velocity (RPM) command reference and sinusoidally commutates the motor by Hall Sensors or encoder commutation tracks and an incremental encoder. Note: This version can operate without Hall Sensors or encoder commutation tracks by using Glentek's "twang mode" initialization.

**Note: Voice coil and DC brush modes are also available upon request.**

# LINEAR BRUSHLESS SERVO DRIVES

Features	
<b>Bandwidth</b>	All servo drives have a nominal 10kHz current loop bandwidth which varies with the motor inductance.
<b>Linear output stage</b>	Provides high bandwidth, low noise, and zero crossover distortion.
<b>Multimode operation</b>	The 2-phase sinusoidal current mode servo drive can drive 3-phase brushless servo motors in current (torque) mode. The Trapezoidal servo drive can drive 3-phase brushless servo motors in current (torque) mode and can close the velocity loop via feedback of a DC tachometer. The encoder-based sinusoidal servo drive can drive 3-phase brushless servo motors in current (torque) or velocity (RPM) mode.
<b>Wide operating voltage</b>	Operating voltages range from either +/-20 to +/-55 VDC for standard voltage versions or +/-25 to +/-75 VDC for high power versions.
<b>Industry standard mounting</b>	Available in a standard heatsink module, large heatsink module w/fan and cover or a 2-axis chassis version. Note: Glentek offers custom mounting configurations to meet virtually any requirement.
<b>Ergonomic Design</b>	Easy access to connections, adjustments and test points.
<b>Fault protection</b>	Fault protection: Short from output to output, short from output to ground, drive RMS over current, drive under/over voltage and drive over temperature.
<b>Motor over temp</b>	An input is provided for a motor over temperature switch and will shutdown the drive and display a fault.
<b>Status indicator</b>	7-segment LED display indicates drive status and diagnostics.
<b>Dedicated inputs</b>	+/- limits, enable, fault, motor over temperature and reset for Trapezoidal and Encoder-based versions. Enable, fault, motor over temperature and reset for 2-phase sinusoidal versions.
<b>External fault reset</b>	An input is provided to reset the drive in the event of a fault.
<b>Manual reset</b>	A push button reset is available to reset a fault.
<b>Current limit</b>	Peak motor current is adjustable.
<b>RoHS compliant</b>	RoHS compliance optional.
<b>CE marked</b>	All servo drives are CE marked in accordance with EN60204-1 (IEC204-1).

Environmental Conditions	
<b>Storage Temperature</b>	-40°C to 80°C
<b>Operating Temperature</b>	Standard: 0°C to 40°C without current derating, up to 50°C with 25% current derating Special: -40°C to 40°C without current derating, up to 50°C with 25% current derating
<b>Humidity</b>	5% to 95% relative humidity, non-condensing
<b>Altitude</b>	Up to 1000m without derating, derate current 10% per 1000m above 1000m

## LINEAR BRUSHLESS ELECTRICAL RATINGS

Model	Power Output (Continuous)*	Power Output (Peak)*	Current (Stall)	Current (Continuous)	Current (Peak)
<b>SMA6520-50LB</b>	200	1000	2.5	5	12.5
<b>SMA6520-50HS</b>	400	2000	5	10	25
<b>SMA6520-50HF</b>	500	2000	5	10	25

Note 1: \* Heatsink dissipation power @ 25°C

Note 2: Current trip time and peak current is adjustable.

Note 3: Output power ratings based on Glentek or customer supplied airflow.

Note 4: If the motor is not rotating, stall current is used. If the motor is rotating, continuous current is used.

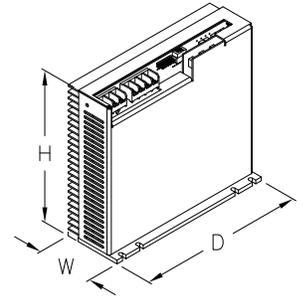
Input Power Connections and Voltages	
<b>Bipolar Supply Voltage</b>	Standard Voltage: +/-20 to +/- 55 VDC High Voltage: +/-25 to +/-75 VDC
<b>VAC input (for stand alone and multi-axis packages)</b>	17-53 VAC
<b>Auxiliary Bias Supply Voltage</b>	+/-15 VDC regulated +/-400 mA.
<b>Command A &amp; B Analog Signals</b>	+/-20 VDC maximum (differential)
<b>Fan Power</b>	Fan power for module model (SMA6520-50HF): 24 VDC Fan power for 2-axis chassis: 115 VAC, single phase, or 230 VAC, single-phase

# LINEAR BRUSHLESS SERIES DIMENSIONS

## Module

Glentek's SMA6520 series linear servo drives are offered in three module styles: the low power 50LB, the standard 50HS, and the high power 50HF which includes a fan. All modules accept any of the three available plug in boards (2-phase sinusoidal current mode, trapezoidal, or encoder-based commutation).

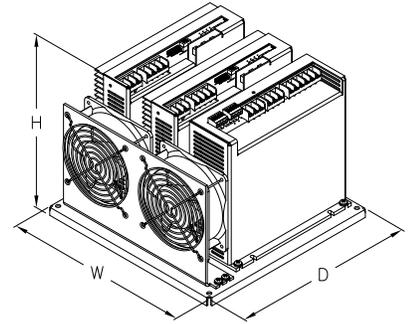
Model Number	Dimensions, Inches (mm)			Weight lbs. (kg)
	Width	Height	Depth	
<b>SMA6520-50LB-1</b>	2.2 (56)	7.7 (196)	8.8 (224)	3.2 (1.5)
<b>SMA6520-50HS-1</b>	2.9 (74)	7.7 (196)	8.8 (224)	4.2 (1.9)
<b>SMA6520-50HF-1</b>	5.3 (135)	8.0 (203)	10.4 (264)	7.4 (3.4)



## Multi-Axis

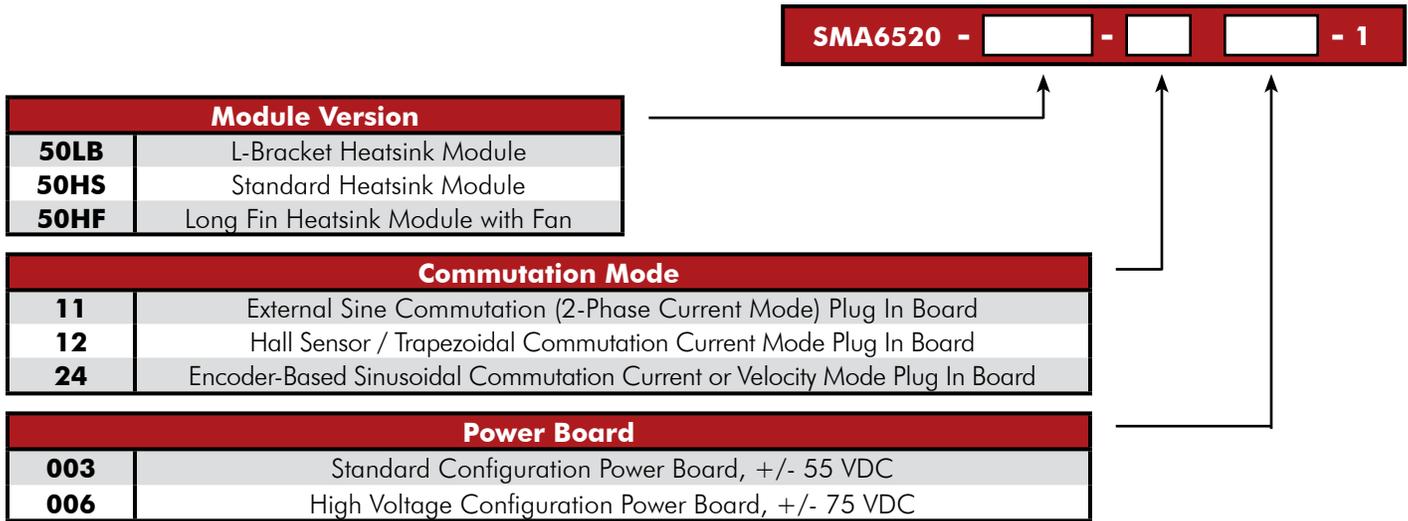
A 2-axis baseplate design with 2 slots available for modules has a bridge rectifier, cooling fan and filter capacitors for the required bipolar DC voltage for the modules along with the +/-15 VDC logic supply needed for the bias voltages.

Model Number	Axes	Dimensions, Inches (mm)			Weight lbs. (kg)
		Width	Height	Depth	
<b>SMA6520-50LB</b>	<b>2</b>	12.5 (318)	8.6 (218)	11.3 (286)	13.4 (6.1)
<b>SMA6520-50HS</b>	<b>2</b>	12.5 (318)	8.6 (218)	11.3 (286)	15.4 (7.0)



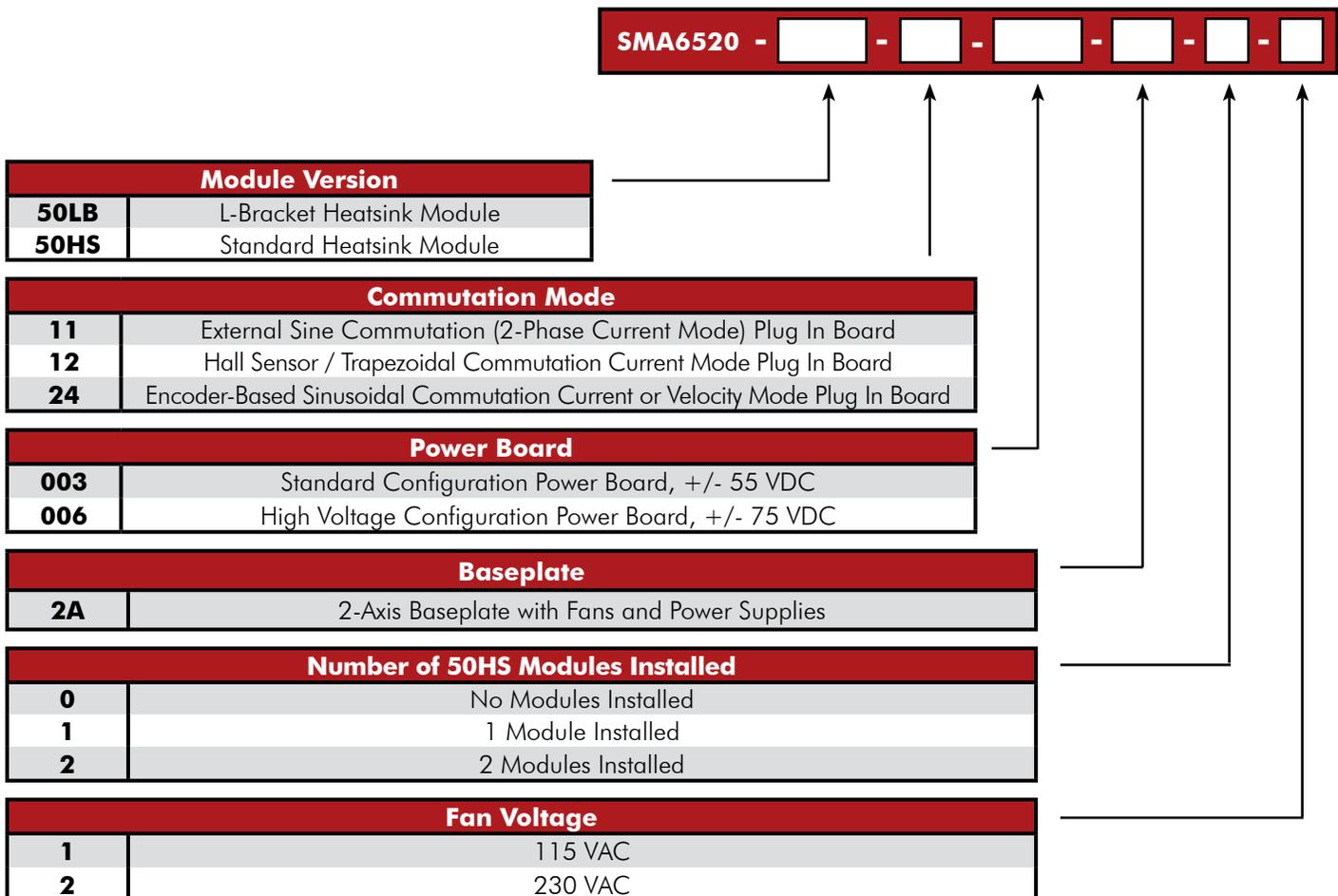
# LINEAR BRUSHLESS SERIES MODULE MODEL NUMBERING

This section explains the model numbering system for Glentek's Linear Servo Drives. The model numbering system is designed so that you, our customer, will be able to quickly and accurately create the model number for the drive that best suits your requirements.



**Note: Voice coil and DC brush modes are also available upon request.**

# LINEAR BRUSHLESS SERIES MULTI-AXIS MODEL NUMBERING



**Note: Voice coil and DC brush modes are also available upon request.**

# LINEAR BRUSH SERVO DRIVES



Glentek offers the latest in high performance Linear Brush Servo Drives for the control of both DC brush servo motors and voice coil motors. With extensive utilization of surface mount technology and special heat transfer techniques, Glentek's Linear Brush Servo Drives offer one of the world's most powerful products for a given form factor. These drives are best suited for low inertia applications that require high bandwidth, low noise, and zero crossover distortion and motors or voice coils which require high current loop bandwidths.

Features	
<b>Linear output stage</b>	Provides high bandwidth, low noise, and zero crossover distortion.
<b>Bandwidth</b>	Standard servo drives have a nominal 10 kHz current loop bandwidth which varies with the motor inductance. High performance SMA5005-4 models (current mode only) have a nominal 15 kHz current loop bandwidth. Note: high performance models have fixed digital inputs. See model numbering on <a href="#">pgs. 42-45</a> .
<b>Multimode operation</b>	All models can operate in current (torque) or velocity (RPM) mode and accept a +/-10 VDC analog input as a command reference. Note: SMA5005-4 is current mode only.
<b>Feedback</b>	Models can close the velocity loop via a DC tachometer.
<b>Wide operating voltage</b>	Operating voltage ranges are 24-75 VDC for the SMA5005 Module configuration and 17-39 VAC (from transformer with center tap) for the SMA5015 Stand Alone configuration.
<b>Internal heat dissipation</b>	(@ 25°C): 100 Watts continuous for SMA5005-xLB, 250 Watts continuous for the SMA5005-xSF, and 300 Watts continuous for the SMA5015.
<b>Ergonomic design</b>	Easy access to connections, adjustments, and test points.
<b>SMT Construction</b>	Provides ultra compact size, cost competitive package, and high reliability.
<b>Industry standard mounting</b>	Available in a Module, Multi-Axis, and Stand Alone configuration. Optional custom mounting configurations are available to meet virtually any requirement.
<b>Fault protection</b>	Short from output to output, short from output to ground, drive RMS over current, drive under/over voltage (SMA5015 only), and drive over temperature.
<b>Status indicator</b>	7-segment LED display (SMA5015) or LEDs (5005) indicates drive status.
<b>Dedicated inputs</b>	+/- limits, inhibit, fault and reset. Note: high performance SMA5005-4 models only have reset and inhibit digital inputs and the logic type and pull-up voltage is fixed. See model numbering.
<b>External fault reset</b>	An input is provided to reset the drive in the event of a fault.
<b>Manual fault reset</b>	A push button reset is available on the SMA5015.
<b>Current limit</b>	Peak motor current is adjustable.
<b>Compliance</b>	All servo drives are CE marked in accordance with EN60204-1 (IEC204-1), and RoHS compliant

Environmental Conditions	
<b>Storage Temperature</b>	-40°C to 80°C
<b>Operating Temperature</b>	Standard: 0°C to 40°C without current derating, up to 50°C with 25% current derating Special: -40°C to 40°C without current derating, up to 50°C with 25% current derating
<b>Humidity</b>	5% to 95% relative humidity, non-condensing
<b>Altitude</b>	Up to 1000m without derating, derate current 10% per 1000m above 1000m

# LINEAR BRUSH SERIES ELECTRICAL RATINGS

## Module

Model Number <sup>(1)</sup>	Input Voltage (VDC)	Continuous Current (A) <sup>(2)</sup>	Peak Current (A) <sup>(2)</sup>	Rated Internal Power Dissipation (W) <sup>(3)</sup>
SMA5005-xLB	24-75	5	15	100
SMA5005-xSF	24-75	5	15	250

## Multi-Axis

Model Number <sup>(1)</sup>	Input Voltage (VAC)	Continuous Current (A)	Peak Current (A)	Rated Internal Power Dissipation (W) <sup>(3)</sup>
SMA5005-xLB	17-53	5	15	100
SMA5005-xSF	17-53	5	15	250

## Stand Alone

Model Number	Input Voltage (VAC from transformer with center tap)	Continuous Current (A)	Peak Current (A)	Rated Internal Power Dissipation (W) <sup>(3)</sup>
SMA5015	17-39	10	25	300

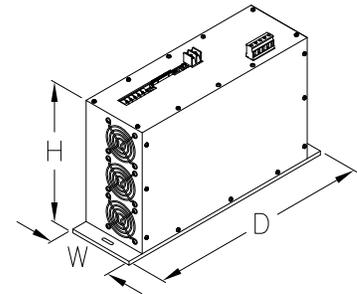
Notes: <sup>(1)</sup>The x in the model number is a placeholder. <sup>(2)</sup>With external forced-air cooling. <sup>(3)</sup>At ambient temperature (25°C). Current ratings are for reference only because they are highly system dependent, varying based on input voltage and motor resistance. Power dissipation is a more accurate rating. Please contact Glentek with your system requirements and we will help assist you with product selection.

# LINEAR BRUSH SERIES DIMENSIONS

## Stand Alone

The Stand Alone mounting configuration consists of a servo drive, DC bus power supply, external bias voltage supply, and cooling fans. This package is used for single and multi-axis applications.

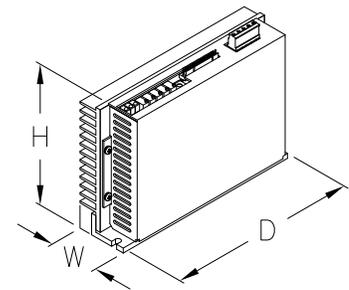
Model Number	Dimensions, Inches (mm)			Weight, lbs. (kg)
	Width	Height	Depth	
SMA5015	4.3 (109)	9.0 (229)	14.5 (368)	10.2 (4.6)



## Module

The Module mounting configuration consists of a servo drive only and does not include the DC bus power supply. This package offers the smallest mechanical form factor and is a very cost effective solution for single and multi-axis applications where the customer provides the DC bus supply and forced air cooling.

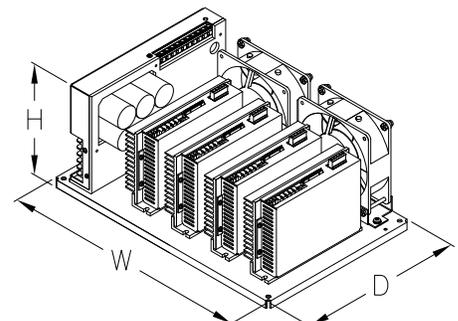
Model Number	Dimensions, Inches (mm)			Weight, lbs. (kg)
	Width	Height	Depth	
SMA5005-xLB	1.2 (30)	5.0 (127)	7.1 (180)	1.1 (0.5)
SMA5005-xSF	1.9 (48)	5.0 (127)	7.1 (180)	1.5 (0.7)



## Multi-Axis

The Multi-Axis mounting configuration consists of an open frame base plate chassis with DC bus power supply, in-rush current limiting protection at power-on, fuses, and cooling fans. Available in 2 & 4 axis packages.

Model Number	Axes	Dimensions, Inches (mm)			Weight, lbs. (kg)
		Width	Height	Depth	
SMA5005	2	9.8 (249)	6.9 (175)	10.8 (274)	9.5 (4.3)
SMA5005	4	14.9 (378)	6.9 (175)	10.8 (274)	15.1 (6.7)



# LINEAR BRUSH SERIES MODEL NUMBERING

This section explains the model numbering system for Glentek's SMA5005 and SMA5015 Series High Performance Linear Brush servo drives. The model numbering system is designed so that you, our customer, will be able to quickly and accurately create the model number for the drive that best suits your requirements. **Please choose the model and package configuration you require from the "Electrical Ratings" table on pg. 41.** Then complete the drive configuration code you require using the information on this page.

## LINEAR BRUSH SERIES MODULE MODEL NUMBERING (STANDARD PERFORMANCE MODELS ONLY)

Operation Mode	
	Leave blank for standard performance current mode drives
<b>S</b>	Velocity mode - small motor (< 3" Frame)
<b>L</b>	Velocity mode - large motor (≥ 3" Frame)

Internal Heat Dissipation	
<b>LB</b>	100 W (L-bracket heatsink)
<b>SF</b>	250 W (Short fin heatsink)

Reset	
Enter binary code from Table 1.1	

Inhibit	
Enter binary code from Table 1.1	

+/- Limits	
Enter binary code from Table 1.1	

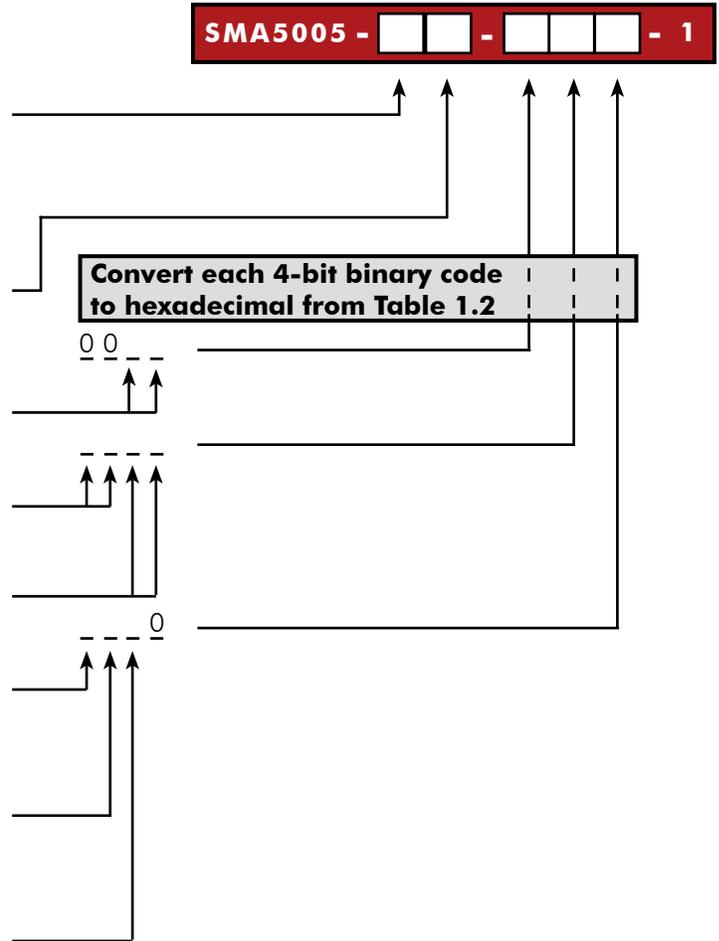
Signal Input	
<b>0</b>	Single Ended
<b>1</b>	Differential

Mode	
<b>0</b>	Velocity
<b>1</b>	Current

Pull Up Voltage (For Reset, Inhibit, +/-, etc.)	
<b>0</b>	15 VDC
<b>1</b>	5 VDC



## LINEAR BRUSH SERIES STANDALONE MODEL NUMBERING (STANDARD PERFORMANCE MODELS ONLY)

SMA5015 - [ ] [ ] [ ] - 1A - 1

**Drive Configuration** (Reset, Inhibit, +/- Limits, Signal Input, Mode, Pull Up Voltage) — Same as Module and Multi-Axis, see above

# LINEAR BRUSH SERIES MULTI-AXIS MODEL NUMBERING (STANDARD PERFORMANCE MODELS ONLY)

SMA5005 - [ ] [ ] - [ ] [ ] [ ] - [ ] A - [ ]

Operation Mode	
	Leave blank for standard performance current mode drives
<b>S</b>	Velocity mode - small motor (<3" Frame)
<b>L</b>	Velocity mode - large motor (≥ 3" Frame)

Internal Heat Dissipation (per axis)	
<b>LB</b>	100 W (L-bracket heatsink)
<b>SF</b>	250 W (Short fin heatsink)

Reset	
Enter binary code from Table 1.1	

Inhibit	
Enter binary code from Table 1.1	

+/- Limits	
Enter binary code from Table 1.1	

Signal Input	
<b>0</b>	Single Ended
<b>1</b>	Differential

Mode	
<b>0</b>	Velocity
<b>1</b>	Current

Pull Up Voltage (For Reset, Inhibit, etc.)	
<b>0</b>	15 VDC
<b>1</b>	5 VDC

Mounting Configuration	
<b>2</b>	2-Axis Chassis
<b>4</b>	4-Axis Chassis

Number of Drive Modules Installed	
<b>1</b>	1 Drive Module (2-Axis Chassis)
<b>2</b>	2 Drive Module (2-Axis Chassis)
<b>3</b>	3 Drive Module (4-Axis Chassis)
<b>4</b>	4 Drive Module (4-Axis Chassis)

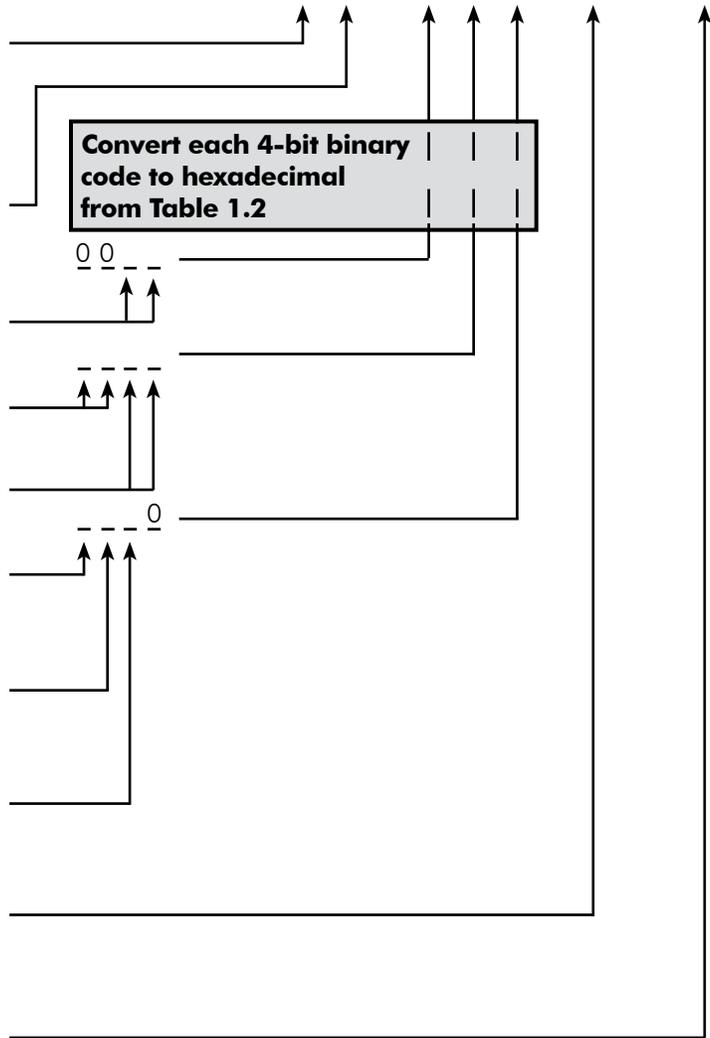


Table 1.1 Function Configuration (Inhibit, Reset, +/- Limits)			
Binary	Input is:	Input State is:	Function Input Configuration
<b>00</b>	Internally Pulled Up	Active When Low	Requires grounding of input to activate the function
<b>01</b>	Internally Pulled Up	Active When High	Requires grounding of input to deactivate the function
<b>10</b>	Internally Pulled Down	Active When Low	Requires a positive voltage at input to deactivate the function
<b>11</b>	Internally Pulled Down	Active When High	Requires a positive voltage at input to activate the function

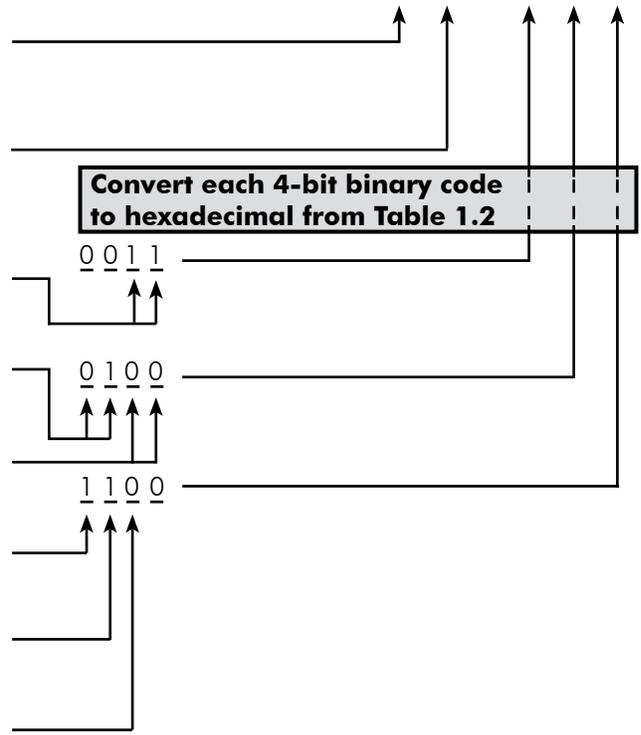
Table 1.2 Binary to Hexadecimal Conversion			
Binary	Hex	Binary	Hex
<b>0000</b>	0	<b>1000</b>	8
<b>0001</b>	1	<b>1001</b>	9
<b>0010</b>	2	<b>1010</b>	A
<b>0011</b>	3	<b>1011</b>	B
<b>0100</b>	4	<b>1100</b>	C
<b>0101</b>	5	<b>1101</b>	D
<b>0110</b>	6	<b>1110</b>	E
<b>0111</b>	7	<b>1111</b>	F

**Example:** Function: Reset, Binary Code: **00**. The default state of the input is high, because the input is internally pulled up. Because the function (reset) is active when low, the function (reset) will not be activated. Activating the function (reset) requires grounding the input (externally pulling it down to low).

# LINEAR BRUSH SERIES MODULE MODEL NUMBERING (HIGH PERFORMANCE SMA5005-4 MODELS ONLY)

SMA5005 - 4 - 3 4 C - 1

Operation Mode	
4	High Performance (nominal 15 kHz current loop bandwidth) <sup>(1)</sup>
Internal Heat Dissipation	
LB	100 W (L-bracket heatsink)
SF	250 W (Short fin heatsink)
Reset	
11	Pulled down active high
Inhibit	
01	Pulled up active high
+/- Limits	
00	Not available
Signal Input	
1	Differential
Mode	
1	Current
Pull Up Voltage (For Reset, Inhibit, +/-, etc.)	
0	15 VDC



**Note:** <sup>(1)</sup> High Performance SMA5005-4 servo drives have fixed digital inputs. Reset is pulled down active high, inhibit is pulled up active high, and there are no +/- limits. Signal input is set for differential, but can be configured for single ended input by externally grounding one of the two signal input lines. Due to the high performance and high current loop bandwidth, voice coil/motor parameters, operating voltage, and desired current loop bandwidth are required upon ordering.

Binary	Input is:	Input State is:	Function Input Configuration
00	Internally Pulled Up	Active When Low	Requires grounding of input to activate the function
01	Internally Pulled Up	Active When High	Requires grounding of input to deactivate the function
10	Internally Pulled Down	Active When Low	Requires a positive voltage at input to deactivate the function
11	Internally Pulled Down	Active When High	Requires a positive voltage at input to activate the function

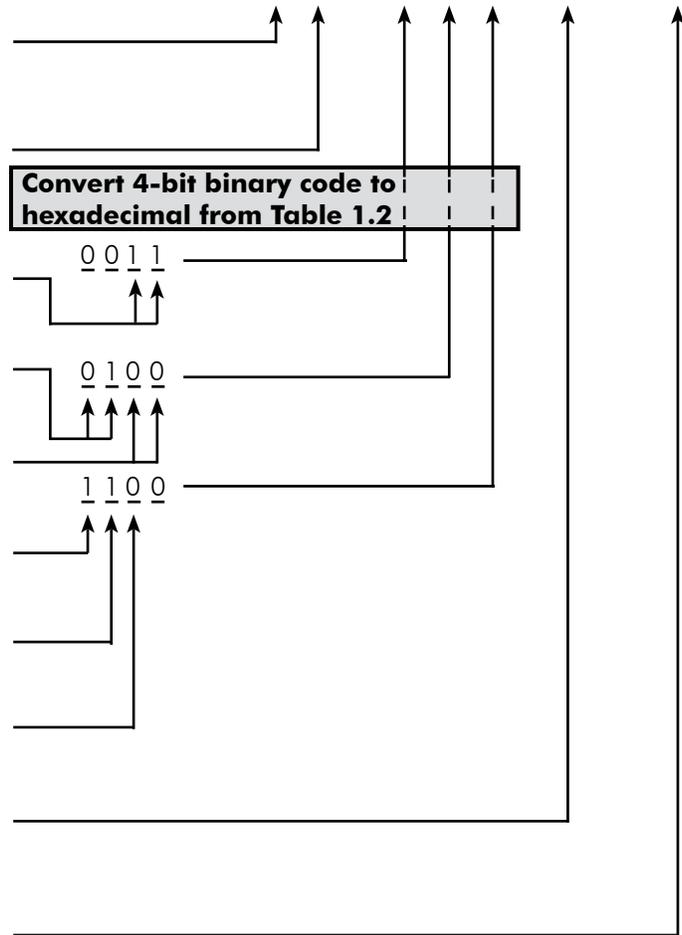
Binary	Hex	Binary	Hex
0000	0	1000	8
0001	1	1001	9
0010	2	1010	A
0011	3	1011	B
0100	4	1100	C
0101	5	1101	D
0110	6	1110	E
0111	7	1111	F

**Example:** Function: Reset, Binary Code: 00. The default state of the input is high, because the input is internally pulled up. Because the function (reset) is active when low, the function (reset) will not be activated. Activating the function (reset) requires grounding the input (externally pulling it down to low).

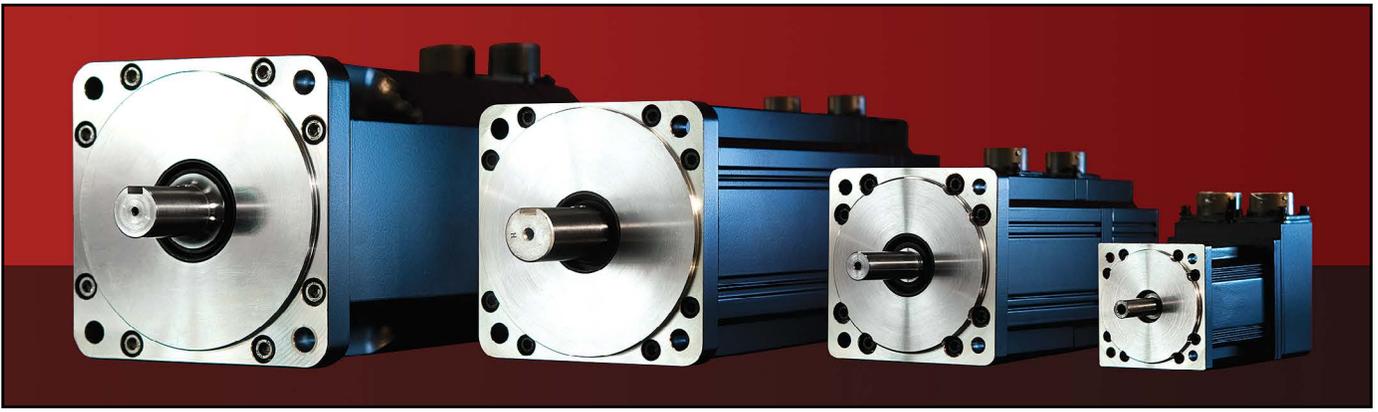
# LINEAR BRUSH SERIES MULTI-AXIS MODEL NUMBERING (HIGH PERFORMANCE SMA5005-4 MODELS ONLY)

SMA5005 - 4 - 3 4 C - A -

Operation Mode	
4	High Performance (nominal 15 kHz current loop bandwidth) <sup>(1)</sup>
Internal Heat Dissipation	
LB	100 W (L-bracket heatsink)
SF	250 W (Short fin heatsink)
Reset	
11	Pulled down active high
Inhibit	
01	Pulled up active high
+/- Limits	
00	Not available
Signal Input	
1	Differential
Mode	
1	Current
Pull Up Voltage (For Reset, Inhibit, +/-, etc.)	
0	15 VDC
Mounting Configuration	
2	2-Axis Chassis
4	4-Axis Chassis
Number of Drive Modules Installed	
1	1 Drive Module (2-Axis Chassis)
2	2 Drive Module (2-Axis Chassis)
3	3 Drive Module (4-Axis Chassis)
4	4 Drive Module (4-Axis Chassis)



**Note:** <sup>(1)</sup> High Performance SMA5005-4 servo drives have fixed digital inputs. Reset is pulled down active high, inhibit is pulled up active high, and there are no +/- limits. Signal input is set for differential, but can be configured for single ended input by externally grounding one of the two signal input lines. Due to the high performance and high current loop bandwidth, voice coil/motor parameters, operating voltage, and desired current loop bandwidth are required upon ordering.



## BRUSHLESS SERVO MOTORS

To accommodate your complete servo system requirements, Glentek manufactures two complete series (GMB and GMBF) of high performance, permanent magnet brushless servo motors. Following is a general description of each series:

### GMB SERIES

The GMB series utilize high-energy Neodymium-Iron-Boron (NdFeB) magnets which when combined with low inertia rotors, provide high dynamic performance. Due to the high torque to inertia ratio of these motors, they are ideal for applications which require high acceleration and deceleration characteristics. In addition, all frame sizes incorporate skewed stators which provide ultra smooth operation (i.e. low cogging torque) at all speeds. Motors are available in industry standard English, Metric and NEMA mounting configurations.

- Continuous Torque Range:  
2.4 Lb-in (0.27 Nm) to 1,092 Lb-in (123.4 Nm)
- Peak Torque Range:  
7 Lb-in (0.81 Nm) to 3,276 Lb-in (370.2 Nm)

### GMBF SERIES

The GMBF series utilize traditional ferrite magnets which are ideal for cost sensitive applications. In addition, the higher inertia rotors provide improved motor to load inertia matching for medium to high inertia loads. This helps to reduce the mechanical shaft resonance which allows higher servo gains with increased stability. In addition, all frame sizes incorporate skewed stators which provide ultra smooth operation (i.e. low cogging torque) at all speeds. Motors are available in industry standard English, Metric and NEMA mounting configurations.

- Continuous Torque Range:  
22.0 Lb-in (2.49 Nm) to 75.0 Lb-in (8.47 Nm)
- Peak Torque Range:  
66.0 Lb-in (7.46 Nm) to 225 Lb-in (25.42 Nm)

Feature	GMB	GMBF
<b>X = Standard, O = Optional</b>		
High-energy Neodymium-Iron-Boron (NdFeB) magnet design with low inertia rotors provides a high dynamic performance, high torque to inertia ratio and one of the world's most powerful motors for a given mechanical form factor.	<b>X</b>	
Traditional ferrite magnet design, which are ideal for cost sensitive applications. In addition, the higher inertia rotors provide improved motor to load inertia matching for medium to high inertia loads.		<b>X</b>
Special design provides ultra smooth operation (i.e. low cogging torque) at all speeds.	<b>X</b>	<b>X</b>
Constructed to withstand the toughest industrial environment with rugged, high performance bearings and TENV construction with IP65 sealing standard (shaft seal required for IP65).	<b>X</b>	<b>X</b>
Normally closed thermal switch provides over temperature protection.	<b>X</b>	<b>X</b>
Various electrical windings are available as standard to suit both low (120 VAC) and high (230 VAC) voltage drives in order to provide optimum speed and torque characteristics. Optional custom electrical windings are available to meet virtually any requirement as well as 380 and 460 VAC line voltages.	<b>X</b>	<b>X</b>
Worldwide standard mounting configurations (i.e. English, Metric and NEMA). Optional custom mounting configurations are available to meet virtually any requirement.	<b>X</b>	<b>X</b>
Encoder with commutation tracks, brushless resolvers or Hall sensors are the standard feedback devices offered	<b>X</b>	<b>X</b>
Absolute serial encoders (both single and multi-turn).	<b>O</b>	<b>O</b>
Analog Sin/Cos encoder.	<b>O</b>	<b>O</b>
Shaft keyway.	<b>X</b>	<b>X</b>
Class H insulation.	<b>X</b>	<b>X</b>
24 VDC holding brake.	<b>O</b>	<b>O</b>
UL Recognized Component for the US and Canada in accordance with UL 1004-1.	<b>X</b>	<b>X</b>
CE marked in accordance with EN61000-6-4:2007/A1:2011.	<b>X</b>	<b>X</b>
RoHS compliant.	<b>X</b>	<b>X</b>

Environmental Conditions	
Storage Temperature:	-20°C to 70°C
Operating Temperature:	Standard: -20°C to 40°C without derating, derate torque 10% per 10°C above 40°C Special: -40°C to 40°C without derating, derate torque 10% per 10°C above 40°C
Humidity:	5% to 95% relative humidity, non-condensing
Altitude:	Up to 1000m without derating, derate torque 10% per 1000m above 1000m



# GMB & GMBF SERIES SELECTION TABLE

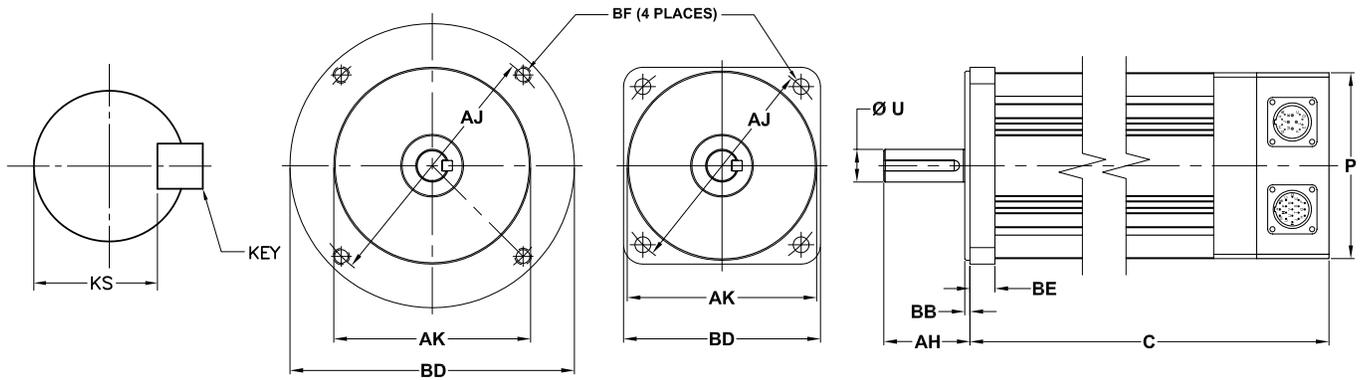
Model Number	Power @ Rated Speed		Speed, RPM		Cont. Stall Rating			Peak Stall Rating			K <sub>T</sub>		K <sub>V</sub>	R <sub>A</sub>	L <sub>A</sub>	Rotor Inertia	
	HP	KW	Max	Rated	Lb-in	Nm	A	Lb-in	Nm	A	Lb-in/A	Nm/A	V <sub>RMS</sub> /kRPM	Ω	mH	Lb-in-sec <sup>2</sup>	Kg-m <sup>2</sup>
GMB2005-8	0.12	0.09	5000*	4000*	2.4	0.27	2.7	7.2	0.81	8.1	0.90	0.10	8	6.3	5.8	0.000054	0.000006
GMB2005-17	0.12	0.09	5000*	4000*	2.4	0.27	1.2	7.2	0.81	3.6	1.92	0.22	17	26.0	25.0	0.000054	0.000006
GMB2010-8	0.25	0.19	5000*	4000*	5	0.56	5.5	15	1.68	16.5	0.90	0.10	8	1.8	2.3	0.000074	0.000008
GMB2010-17	0.25	0.19	5000*	4000*	5	0.56	2.6	15	1.68	7.8	1.92	0.22	17	8.1	9.3	0.000074	0.000008
GMB2010-28	0.25	0.19	5000*	4000*	5	0.56	1.6	15	1.68	4.8	3.16	0.36	28	20.0	23.0	0.000074	0.000008
GMB2015-8	0.36	0.27	5000*	4000*	7	0.79	7.7	21	2.37	23.1	0.90	0.10	8	0.9	1.6	0.000099	0.000011
GMB2015-17	0.36	0.27	5000*	4000*	7	0.79	3.6	21	2.37	10.8	1.92	0.22	17	5.3	8.3	0.000099	0.000011
GMB2020-8	0.51	0.38	5000*	4000*	10	1.13	11.1	30	3.39	33.3	0.90	0.10	8	0.6	0.9	0.000113	0.000013
GMB2020-17	0.51	0.38	5000*	4000*	10	1.13	5.2	30	3.39	15.6	1.92	0.22	17	3.0	4.7	0.000113	0.000013
GMB2020-28	0.51	0.38	5000*	4000*	10	1.13	3.2	30	3.39	9.6	3.16	0.36	28	7.8	14.0	0.000113	0.000013
GMB2030-28	0.66	0.49	5000*	4000*	13	1.50	4.1	40	4.52	12.3	3.16	0.36	28	5.4	10.1	0.000133	0.000015
GMB3515-23	0.81	0.61	5000*	4000*	16	1.81	6.2	48	5.43	18.6	2.60	0.29	23	1.3	4.6	0.00059	0.000067
GMB3515-38	0.81	0.61	5000	4000	16	1.81	3.8	48	5.43	11.4	4.25	0.48	37	3.6	13.5	0.00059	0.000067
GMB3515-75	0.41	0.30	2500	2000	16	1.81	1.9	48	5.43	5.7	8.50	0.96	75	9.3	36.0	0.00059	0.000067
GMB3530-24	1.52	1.14	5000*	4000*	30	3.39	11.1	90	10.17	33.3	2.71	0.31	24	0.5	2.5	0.0010	0.000113
GMB3530-37	1.52	1.14	5000	4000	30	3.39	7.3	90	10.17	21.9	4.14	0.47	36	1.3	5.8	0.0010	0.000113
GMB3530-48	1.22	0.91	4000	3200	30	3.39	5.5	90	10.17	16.5	5.42	0.61	48	2.5	10.3	0.0010	0.000113
GMB3530-73	0.76	0.57	2500	2000	30	3.39	3.6	90	10.17	10.8	8.27	0.93	73	3.1	16.0	0.0010	0.000113
GMB3545-25	1.98	1.48	5000*	4000*	39	4.41	13.8	117	13.23	41.4	2.82	0.32	25	0.5	2.1	0.0014	0.000158
GMB3545-50	1.58	1.18	4000	3200	39	4.41	6.9	117	13.23	20.7	5.65	0.64	50	1.1	5.6	0.0014	0.000158
GMB3545-110	0.69	0.52	1800	1400	39	4.41	3.1	117	13.23	9.3	12.43	1.40	110	6.5	33.6	0.0014	0.000158
GMBF4320-25	0.89	0.67	4000	3200	22	2.49	7.5	66	7.47	22.5	2.82	0.32	26	1.1	8.4	0.0032	0.000362
GMBF4320-50	0.89	0.67	4000	3200	22	2.49	3.8	66	7.47	11.4	5.76	0.65	51	4.7	14.7	0.0032	0.000362
GMBF4320-75	0.56	0.42	2500	2000	22	2.49	2.6	66	7.47	7.8	8.47	0.96	75	11.0	39.5	0.0032	0.000362
GMBF4320-100	0.39	0.29	1800	1400	22	2.49	1.9	66	7.47	5.7	11.41	1.29	101	18.5	43.8	0.0032	0.000362
GMBF4340-25	1.46	1.09	4000	3200	36	4.07	12.3	108	12.21	36.9	2.82	0.32	26	0.4	5.2	0.0059	0.000667
GMBF4340-50	1.46	1.09	4000	3200	36	4.07	6.2	108	12.21	18.6	5.76	0.65	51	2.1	14.0	0.0059	0.000667
GMBF4340-75	0.91	0.68	2500	2000	36	4.07	4.2	108	12.21	12.6	8.47	0.96	75	4.1	36.3	0.0059	0.000667
GMBF4340-100	0.64	0.48	1800	1400	36	4.07	3.2	108	12.21	9.6	11.41	1.29	101	7.0	41.2	0.0059	0.000667
GMBF4360-25	1.87	1.39	4000	3200	46	5.20	16.1	138	15.60	48.3	2.82	0.32	25	0.1	3.6	0.0086	0.000972
GMBF4360-50	1.87	1.39	4000	3200	46	5.20	8.0	138	15.60	24.0	5.76	0.65	51	1.0	11.9	0.0086	0.000972
GMBF4360-75	1.17	0.87	2500	2000	46	5.20	5.5	138	15.60	16.5	8.36	0.94	74	2.3	19.8	0.0086	0.000972
GMBF4360-100	0.82	0.61	1800	1400	46	5.20	4.1	138	15.60	12.3	11.30	1.28	100	3.9	28.7	0.0086	0.000972
GMB4525-34**	2.79	2.08	5000	4000	55	6.21	14.3	165	18.63	42.9	3.84	0.43	34	0.6	3.5	0.0026	0.000294
GMB4525-55**	1.95	1.46	3500	2800	55	6.21	8.9	165	18.63	26.7	6.21	0.70	55	1.8	11.2	0.0026	0.000294
GMB4525-110**	0.98	0.73	1800	1400	55	6.21	4.4	165	18.63	13.2	12.43	1.40	110	7.2	39.8	0.0026	0.000294
GMB4550-37**	4.21	3.14	5000	4000	83	9.38	19.9	249	28.14	59.7	4.18	0.47	37	0.2	1.8	0.0051	0.000576
GMB4550-55**	2.95	2.20	3500	2800	83	9.38	13.4	249	28.14	40.2	6.21	0.70	55	0.6	4.9	0.0051	0.000576
GMB4550-74**	2.11	1.57	2500	2000	83	9.38	9.9	249	28.14	29.7	8.36	0.94	74	1.1	8.3	0.0051	0.000576
GMB4550-110**	1.47	1.10	1800	1400	83	9.38	6.7	249	28.14	20.1	12.43	1.40	110	2.6	17.0	0.0051	0.000576

# GMB & GMBF SERIES SELECTION TABLE

Model Number	Power @ Rated Speed		Speed, RPM		Cont. Stall Rating			Peak Stall Rating			K <sub>T</sub>		K <sub>V</sub>	R <sub>A</sub>	L <sub>A</sub>	Rotor Inertia	
	HP	KW	Max	Rated	Lb-in	Nm	A	Lb-in	Nm	A	Lb-in/A	Nm/A	V <sub>RMS</sub> /kRPM	Ω	mH	Lb-in-sec <sup>2</sup>	Kg-m <sup>2</sup>
<b>GMB4560-50**</b>	4.06	3.03	4000	3200	100	11.30	17.7	300	33.90	53.1	5.65	0.64	50	0.4	2.8	0.0064	0.000727
<b>GMB4560-90**</b>	2.16	1.61	2100	1700	100	11.30	9.8	300	33.90	29.4	10.17	1.15	90	1.1	9.7	0.0064	0.000727
<b>GMB4575-35**</b>	5.89	4.39	5000	4000	116	13.11	29.3	348	39.33	87.9	3.95	0.45	35	0.1	1.1	0.0074	0.000836
<b>GMB4575-55**</b>	4.12	3.07	3500	2800	116	13.11	18.7	348	39.33	56.1	6.21	0.70	55	0.3	2.5	0.0074	0.000836
<b>GMB4575-70**</b>	3.24	2.42	2700	2200	116	13.11	14.7	348	39.33	44.1	7.91	0.89	70	0.5	4.4	0.0074	0.000836
<b>GMB4575-110**</b>	2.06	1.54	1800	1400	116	13.11	9.3	348	39.33	27.9	12.43	1.40	110	1.7	13.4	0.0074	0.000836
<b>GMBF5030-25</b>	1.17	0.87	3500	2800	33	3.68	11.5	98	11.04	34.5	2.82	0.32	25	0.7	3.1	0.014	0.001582
<b>GMBF5030-50</b>	1.17	0.87	3500	2800	33	3.68	5.8	98	11.04	17.4	5.65	0.64	50	2.3	10.2	0.014	0.001582
<b>GMBF5030-61</b>	1.01	0.75	3000	2400	33	3.68	4.4	98	11.04	13.2	7.46	0.84	66	4.6	19.9	0.014	0.001582
<b>GMBF5030-75</b>	0.84	0.62	2500	2000	33	3.68	3.8	98	11.04	11.4	8.47	0.96	75	4.8	23.0	0.014	0.001582
<b>GMBF5040-25</b>	1.42	1.06	3500	2800	40	4.52	14.2	120	13.56	42.6	2.82	0.32	25	0.3	3.0	0.019	0.002147
<b>GMBF5040-50</b>	1.42	1.06	3500	2800	40	4.52	7.1	120	13.56	21.3	5.65	0.64	50	1.4	12.0	0.019	0.002147
<b>GMBF5040-75</b>	1.02	0.76	2500	2000	40	4.52	4.7	120	13.56	14.1	8.47	0.96	75	3.5	28.0	0.019	0.002147
<b>GMBF5060-25</b>	2.67	1.99	3500	2800	75	8.47	26.6	225	25.41	79.8	2.82	0.32	25	0.2	2.0	0.028	0.003164
<b>GMBF5060-50</b>	2.67	1.99	3500	2800	75	8.47	13.3	225	25.41	39.9	5.65	0.64	50	0.9	7.0	0.028	0.003164
<b>GMBF5060-75</b>	1.90	1.42	2500	2000	75	8.47	8.9	225	25.41	26.7	8.47	0.96	75	2.1	11.0	0.028	0.003164
<b>GMB5627-70</b>	3.63	2.71	2700	2200	130	14.7	16	390	44.1	49	7.93	0.90	70	0.54	3.5	0.0111	0.00125
<b>GMB5627-115</b>	2.31	1.72	1700	1400	130	14.7	10	390	44.1	30	13.03	1.47	115	1.5	10.0	0.0111	0.00125
<b>GMB5654-70</b>	5.86	4.37	2700	2200	210	23.7	26	630	71.1	79	7.93	0.90	70	0.20	1.6	0.0197	0.00223
<b>GMB5654-115</b>	3.73	2.78	1700	1400	210	23.7	16	630	71.1	48	13.03	1.47	115	0.50	4.1	0.0197	0.00223
<b>GMB5681-80</b>	6.75	5.04	2400	1900	280	31.6	31	840	94.8	93	9.06	1.02	80	0.17	1.5	0.0287	0.00324
<b>GMB5681-115</b>	4.98	3.71	1700	1400	280	31.6	21	840	94.8	64	13.03	1.47	115	0.34	2.9	0.0287	0.00324
<b>GMB56108-80</b>	8.68	6.47	2400	1900	360	40.7	40	1080	122	119	9.06	1.02	80	0.12	1.1	0.0370	0.00418
<b>GMB56108-115</b>	6.40	4.77	1700	1400	360	40.7	28	1080	122	83	13.03	1.47	115	0.22	1.9	0.0370	0.00418
<b>GMB7530-80</b>	9.65	7.19	2400	1900	400	45	44	1200	135	132	9.06	1.02	80	0.25	2.3	0.0432	0.00488
<b>GMB7530-162</b>	5.08	3.79	1200	1000	400	45	22	1200	135	65	18.35	2.07	162	0.95	9.0	0.0432	0.00488
<b>GMB7560-80</b>	15.44	11.51	2400	1900	640	72	71	1920	216	212	9.06	1.02	80	0.09	1.0	0.0750	0.00848
<b>GMB7560-162</b>	8.12	6.06	1200	1000	640	72	35	1920	216	105	18.35	2.07	162	0.36	4.0	0.0750	0.00848
<b>GMB7590-80</b>	21.22	15.83	2400	1900	880	99	97	2640	298	291	9.06	1.02	80	0.05	0.7	0.1082	0.01223
<b>GMB7590-162</b>	11.17	8.33	1200	1000	880	99	48	2640	298	144	18.35	2.07	162	0.19	2.6	0.1082	0.01223
<b>GMB75120-108</b>	19.41	14.47	1800	1400	1092	123	89	3276	370	268	12.24	1.38	108	0.06	0.8	0.1397	0.01579
<b>GMB75120-162</b>	13.86	10.34	1200	1000	1092	123	60	3276	370	179	18.35	2.07	162	0.14	1.9	0.1397	0.01579
<b>GMB75120-248</b>	8.32	6.20	800	600	1092	123	39	3276	370	117	28.10	3.17	248	0.37	4.4	0.1397	0.01579

**Note:** \* Higher speeds may be attainable depending on the application, contact Glentek for details. \*\* Values for 4 pole design. 6 pole design also available. Max and Rated Speeds are for motors operated with a 230 VAC power supply, except for the GMB75120-248, which are for 460 VAC. All ratings are based on a 25°C ambient temperature and with the motor face mounted to a 1 1/4" x 1 1/4" x 3/4" aluminum heatsink. A = Peak Phase Current • K<sub>T</sub> = Torque Constant • K<sub>V</sub> = B<sub>EMF</sub> = V<sub>RMS</sub> Phase-to-Phase/1000 RPM • R<sub>A</sub> = Phase-to-Phase Resistance • L<sub>A</sub> = Phase-to-Phase Inductance • Please visit our website at [www.glentek.com](http://www.glentek.com) for more details.

# GMB & GMBF METRIC SERIES DIMENSIONS



Model Number	Kg (lbs.)	C (max)	P (max)	Shaft				Flange/Face				Mounting Hole		
				AH	U	KEY	KS	AK	BB	BD	BE	AJ	BF Ø	Tap
<b>GMB2005-XXX-M</b>	<b>0.7</b> (1.5)	<b>99.6</b> (3.9)	<b>57.2</b> (2.25)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>50.00</b> (1.969)	<b>2.50</b> (0.10)	<b>60.0</b> (2.36)	<b>7.1</b> (0.28)	<b>70.00</b> (2.756)	<b>4.50</b> (0.177)	<b>THRU</b>
<b>GMB2010-XXX-M</b>	<b>0.9</b> (2.0)	<b>110.7</b> (4.4)	<b>57.2</b> (2.25)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>50.00</b> (1.969)	<b>2.50</b> (0.10)	<b>60.0</b> (2.36)	<b>7.1</b> (0.28)	<b>70.00</b> (2.756)	<b>4.50</b> (0.177)	<b>THRU</b>
<b>GMB2015-XXX-M</b>	<b>1.1</b> (2.4)	<b>123.4</b> (4.9)	<b>57.2</b> (2.25)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>50.00</b> (1.969)	<b>2.50</b> (0.10)	<b>60.0</b> (2.36)	<b>7.1</b> (0.28)	<b>70.00</b> (2.756)	<b>4.50</b> (0.177)	<b>THRU</b>
<b>GMB2020-XXX-M</b>	<b>1.4</b> (3.1)	<b>146.0</b> (5.7)	<b>57.2</b> (2.25)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>50.00</b> (1.969)	<b>2.50</b> (0.10)	<b>60.0</b> (2.36)	<b>7.1</b> (0.28)	<b>70.00</b> (2.756)	<b>4.50</b> (0.177)	<b>THRU</b>
<b>GMB3515-XXX-M</b>	<b>3.8</b> (8.4)	<b>183.0</b> (7.2)	<b>83.8</b> (3.30)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>80.00</b> (3.150)	<b>3.00</b> (0.12)	<b>89.00</b> (3.50)	<b>11.5</b> (0.45)	<b>100.00</b> (3.937)	<b>7.00</b> (0.276)	<b>THRU</b>
<b>GMB3530-XXX-M</b>	<b>5.4</b> (11.9)	<b>222.4</b> (8.8)	<b>83.8</b> (3.30)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>80.00</b> (3.150)	<b>3.00</b> (0.12)	<b>89.00</b> (3.50)	<b>11.5</b> (0.45)	<b>100.00</b> (3.937)	<b>7.00</b> (0.276)	<b>THRU</b>
<b>GMB3545-XXX-M</b>	<b>6.6</b> (14.5)	<b>261.5</b> (10.3)	<b>83.8</b> (3.30)	<b>30.00</b> (1.18)	<b>14.00</b> (0.551)	<b>M5 SQ X 20</b>	<b>10.9 - 11.0</b>	<b>80.00</b> (3.150)	<b>3.00</b> (0.12)	<b>89.00</b> (3.50)	<b>11.5</b> (0.45)	<b>100.00</b> (3.937)	<b>7.00</b> (0.276)	<b>THRU</b>
<b>GMBF4320-XXX-M</b>	<b>4.1</b> (9.0)	<b>201.7</b> (7.9)	<b>108.0</b> (4.25)	<b>50.00</b> (1.97)	<b>19.00</b> (0.748)	<b>M6 SQ X 40</b>	<b>15.4 - 15.5</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMBF4340-XXX-M</b>	<b>6.3</b> (13.9)	<b>254.0</b> (10.0)	<b>108.0</b> (4.25)	<b>50.00</b> (1.97)	<b>19.00</b> (0.748)	<b>M6 SQ X 40</b>	<b>15.4 - 15.5</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMBF4360-XXX-M</b>	<b>8.5</b> (18.7)	<b>306.3</b> (12.1)	<b>108.0</b> (4.25)	<b>50.00</b> (1.97)	<b>19.00</b> (0.748)	<b>M6 SQ X 40</b>	<b>15.4 - 15.5</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMB4525-XXX-M</b>	<b>8.9</b> (19.6)	<b>218.3</b> (8.6)	<b>114.3</b> (4.50)	<b>50.00</b> (1.97)	<b>19.00</b> (0.748)	<b>M6 SQ X 40</b>	<b>15.4 - 15.5</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMB4550-XXX-M</b>	<b>12.4</b> (27.3)	<b>280.5</b> (11.0)	<b>114.3</b> (4.50)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMB4560-XXX-M</b>	<b>14.0</b> (30.8)	<b>305.4</b> (12.0)	<b>114.3</b> (4.50)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMB4575-XXX-M</b>	<b>15.9</b> (35.0)	<b>345.3</b> (13.6)	<b>114.3</b> (4.50)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>110.00</b> (4.331)	<b>3.00</b> (0.12)	<b>114.30</b> (4.50)	<b>14.7</b> (0.58)	<b>130.00</b> (5.118)	<b>9.19</b> (0.362)	<b>THRU</b>
<b>GMBF5030-XXX-M</b>	<b>10.2</b> (22.4)	<b>294.4</b> (11.6)	<b>131.6</b> (5.18)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>15.4</b> (0.61)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMBF5040-XXX-M</b>	<b>12.5</b> (27.5)	<b>303.8</b> (12.0)	<b>131.6</b> (5.18)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>15.4</b> (0.61)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMBF5060-XXX-M</b>	<b>15.9</b> (35.0)	<b>370.8</b> (14.6)	<b>131.6</b> (5.18)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>15.4</b> (0.61)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMB5627-XXX-M</b>	<b>15.0</b> (33.0)	<b>255.0</b> (10.0)	<b>142.0</b> (5.59)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>20.1</b> (0.79)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMB5654-XXX-M</b>	<b>22.7</b> (49.9)	<b>332.0</b> (13.1)	<b>142.0</b> (5.59)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7 X 38</b>	<b>19.8 - 20.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>20.1</b> (0.79)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMB5681-XXX-M</b>	<b>30.4</b> (66.9)	<b>408.0</b> (16.1)	<b>142.0</b> (5.59)	<b>50.00</b> (1.97)	<b>32.00</b> (1.260)	<b>M10XM8 X 36</b>	<b>26.8 - 27.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>20.1</b> (0.79)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMB56108-XXX-M</b>	<b>38.6</b> (84.9)	<b>484.1</b> (19.1)	<b>142.0</b> (5.59)	<b>50.00</b> (1.97)	<b>32.00</b> (1.260)	<b>M10XM8 X 36</b>	<b>26.8 - 27.0</b>	<b>130.00</b> (5.118)	<b>3.60</b> (0.142)	<b>142.00</b> (5.59)	<b>20.1</b> (0.79)	<b>165.00</b> (6.496)	<b>11.00</b> (0.433)	<b>THRU</b>
<b>GMB7530-XXX-M</b>	<b>30.0</b> (66.0)	<b>294.4</b> (11.6)	<b>190.0</b> (7.48)	<b>58.00</b> (2.28)	<b>32.00</b> (1.260)	<b>M10XM8 X 36</b>	<b>26.8 - 27.0</b>	<b>180.00</b> (7.087)	<b>4.00</b> (0.157)	<b>190.00</b> (7.48)	<b>24.3</b> (0.96)	<b>215.00</b> (8.465)	<b>14.00</b> (0.551)	<b>THRU</b>
<b>GMB7560-XXX-M</b>	<b>44.0</b> (96.8)	<b>370.6</b> (14.6)	<b>190.0</b> (7.48)	<b>58.00</b> (2.28)	<b>32.00</b> (1.260)	<b>M10XM8 X 36</b>	<b>26.8 - 27.0</b>	<b>180.00</b> (7.087)	<b>4.00</b> (0.157)	<b>190.00</b> (7.48)	<b>24.3</b> (0.96)	<b>215.00</b> (8.465)	<b>14.00</b> (0.551)	<b>THRU</b>
<b>GMB7590-XXX-M</b>	<b>59.0</b> (129.8)	<b>446.8</b> (17.6)	<b>190.0</b> (7.48)	<b>58.00</b> (2.28)	<b>48.00</b> (1.890)	<b>M14XM9 X 40</b>	<b>42.3 - 43.5</b>	<b>180.00</b> (7.087)	<b>4.00</b> (0.157)	<b>190.00</b> (7.48)	<b>24.3</b> (0.96)	<b>215.00</b> (8.465)	<b>14.00</b> (0.551)	<b>THRU</b>
<b>GMB75120-XXX-M</b>	<b>73.0</b> (160.6)	<b>523.0</b> (20.6)	<b>190.0</b> (7.48)	<b>58.00</b> (2.28)	<b>48.00</b> (1.890)	<b>M14XM9 X 40</b>	<b>42.3 - 43.5</b>	<b>180.00</b> (7.087)	<b>4.00</b> (0.157)	<b>190.00</b> (7.48)	<b>24.3</b> (0.96)	<b>215.00</b> (8.465)	<b>14.00</b> (0.551)	<b>THRU</b>

Note: Dimensions are in mm, (inches)

# GMB & GMBF ENGLISH SERIES DIMENSIONS

Model Number	Lbs. (Kg)	C (max)	P (max)	Shaft				Flange/Face				Mounting Hole		
				AH	U	KEY	KS	AK	BB	BD	BE	AJ	BF Ø	Tap
GMB2005-XXX-E	1.5 (0.7)	3.92 (99.6)	2.25 (57.2)	0.81 (20.6)	0.3750 (9.53)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.26 (6.60)	2.625 (66.68)	0.200 (5.08)	THRU
GMB2010-XXX-E	2.0 (0.9)	4.36 (110.7)	2.25 (57.2)	0.81 (20.6)	0.3750 (9.53)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.26 (6.60)	2.625 (66.68)	0.200 (5.08)	THRU
GMB2015-XXX-E	2.5 (1.1)	4.86 (123.4)	2.25 (57.2)	0.81 (20.6)	0.3750 (9.53)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.26 (6.60)	2.625 (66.68)	0.200 (5.08)	THRU
GMB2020-XXX-E	3.1 (1.4)	5.75 (146.0)	2.25 (57.2)	0.81 (20.6)	0.3750 (9.53)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.26 (6.60)	2.625 (66.68)	0.200 (5.08)	THRU
GMB2030-XXX-E	4.0 (1.8)	6.67 (169.4)	2.25 (57.2)	0.81 (20.6)	0.3750 (9.53)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.26 (6.60)	2.625 (66.68)	0.200 (5.08)	THRU
NEMA 23				0.81 (20.6)	0.2500 (6.35)			1.500 (38.10)	0.06 (1.52)	2.25 (57.15)	0.30 (7.62)	2.625 (66.68)	0.200 (5.08)	THRU
GMB3515-XXX-E	8.4 (3.8)	7.20 (182.88)	3.30 (83.8)	1.19 (30.2)	0.4997 (12.69)	.125 SQ (3.18)	.420 - .430	2.877 (73.08)	0.06 (1.52)	3.31 (84.07)	0.51 (12.95)	3.875 (98.43)	0.224 (5.69)	THRU
GMB3530-XXX-E	11.9 (5.4)	8.75 (222.25)	3.30 (83.8)	1.19 (30.2)	0.4997 (12.69)	.125 SQ (3.18)	.420 - .430	2.877 (73.08)	0.06 (1.52)	3.31 (84.07)	0.51 (12.95)	3.875 (98.43)	0.224 (5.69)	THRU
GMB3545-XXX-E	14.5 (6.6)	10.29 (261.37)	3.30 (83.8)	1.19 (30.2)	0.4997 (12.69)	.125 SQ (3.18)	.420 - .430	2.877 (73.08)	0.06 (1.52)	3.31 (84.07)	0.51 (12.95)	3.875 (98.43)	0.224 (5.69)	THRU
NEMA 34				1.19 (30.2)	0.3750 (9.53)			2.877 (73.08)	0.06 (1.52)	3.42 (86.87)	0.51 (12.95)	3.875 (98.43)	0.224 (5.69)	THRU
GMBF4320-XXX-E	9.0 (4.1)	7.94 (201.7)	4.25 (108.0)	1.88 (47.8)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.10 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
GMBF4340-XXX-E	13.9 (6.3)	10.00 (254.0)	4.25 (108.0)	1.88 (47.8)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.10 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
GMBF4360-XXX-E	18.7 (8.5)	12.06 (306.3)	4.25 (108.0)	1.88 (47.8)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.10 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
NEMA 42				1.32 (33.5)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	2.188 (55.58)	0.10 (2.54)	4.50 (114.3)	0.60 (15.24)	4.950 (125.73)	0.300 (7.62)	THRU
NEMA 56C				2.06 (52.3)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.12 (3.05)	6.50 (165.1)	0.61 (15.49)	5.875 (149.23)		3/8-16 THRU
GMB4525-XXX-E	19.6 (8.9)	8.59 (218.2)	4.50 (114.3)	1.88 (47.8)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.100 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
GMB4550-XXX-E	27.3 (12.4)	11.04 (280.4)	4.50 (114.3)	1.88 (47.8)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	4.500 (114.30)	0.100 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
GMB4560-XXX-E	31.0 (14.1)	12.02 (305.3)	4.50 (114.3)	1.88 (47.8)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	4.500 (114.30)	0.100 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
GMB4575-XXX-E	35.0 (15.9)	13.59 (345.2)	4.50 (114.3)	1.88 (47.8)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	4.500 (114.30)	0.100 (2.54)	5.00 (127.0)	0.60 (15.24)	5.875 (149.23)		3/8-16 THRU
NEMA 42				1.32 (33.5)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	2.188 (55.58)	0.10 (2.54)	4.50 (114.3)	0.60 (15.24)	4.950 (125.73)	0.300 (7.62)	THRU
NEMA 56C				2.06 (52.3)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.12 (3.05)	6.50 (165.1)	0.61 (15.49)	5.875 (149.23)		3/8-16 THRU
GMBF5030-XXX-E	22.5 (10.2)	11.59 (294.4)	5.18 (131.6)	1.90 (48.3)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	3.000 (76.20)	0.10 (2.54)	5.18 (131.6)	0.60 (15.24)	5.875 (149.23)	0.406 (10.31)	THRU
GMBF5040-XXX-E	27.5 (12.5)	11.96 (303.8)	5.18 (131.6)	1.90 (48.3)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	3.000 (76.20)	0.10 (2.54)	5.18 (131.6)	0.60 (15.24)	5.875 (149.23)	0.406 (10.31)	THRU
GMBF5060-XXX-E	35.0 (15.9)	14.60 (370.8)	5.18 (131.6)	1.90 (48.3)	0.8750 (22.23)	.188 SQ (4.78)	.761 - .771	3.000 (76.20)	0.10 (2.54)	5.18 (131.6)	0.60 (15.24)	5.875 (149.23)	0.406 (10.31)	THRU
NEMA 56C				2.06 (52.3)	0.6250 (15.88)	.188 SQ (4.78)	.507 - .517	4.500 (114.30)	0.12 (3.05)	6.50 (165.1)	0.61 (15.49)	5.875 (149.23)		3/8-16 THRU
GMB5627-XXX-E	33.0 (15.0)	10.06 (255.5)	5.59 (142.0)	1.97 (50.0)	0.875 (22.23)	.188 SQ (4.78)	.761 - .771	4.500 (114.30)	0.140 (3.56)	5.59 (142.0)	0.81 (20.57)	5.875 (149.23)		3/8-16 THRU
GMB5654-XXX-E	50.0 (22.7)	13.06 (331.7)	5.59 (142.0)	1.97 (50.0)	0.875 (22.23)	.188 SQ (4.78)	.761 - .771	4.500 (114.30)	0.140 (3.56)	5.59 (142.0)	0.81 (20.57)	5.875 (149.23)		3/8-16 THRU
GMB5681-XXX-E	67.0 (30.4)	16.06 (407.9)	5.59 (142.0)	1.97 (50.0)	1.250 (31.75)	.250 SQ (6.35)	1.102- 1.112	4.500 (114.30)	0.140 (3.56)	5.59 (142.0)	0.81 (20.57)	5.875 (149.23)		3/8-16 THRU
GMB56108-XXX-E	85.0 (38.6)	19.06 (484.1)	5.59 (142.0)	1.97 (50.0)	1.250 (31.75)	.250 SQ (6.35)	1.102- 1.112	4.500 (114.30)	0.140 (3.56)	5.59 (142.0)	0.81 (20.57)	5.875 (149.23)		3/8-16 THRU
GMB7530-XXX-E	66.0 (29.9)	11.59 (294.4)	7.48 (190.0)	2.28 (57.9)	1.250 (31.75)	.250 SQ (6.35)	1.102- 1.112	7.087 (180.01)	0.16 (4.06)	7.48 (190.0)	0.96 (24.38)	8.464 (214.99)	0.551 (14.00)	THRU
GMB7560-XXX-E	98.0 (44.5)	14.59 (370.6)	7.48 (190.0)	2.28 (57.9)	1.250 (31.75)	.250 SQ (6.35)	1.102- 1.112	7.087 (180.01)	0.16 (4.06)	7.48 (190.0)	0.96 (24.38)	8.464 (214.99)	0.551 (14.00)	THRU
GMB7590-XXX-E	130.0 (59.0)	17.59 (446.8)	7.48 (190.0)	2.28 (57.9)	1.875 (47.63)	.500 SQ (12.70)	1.581- 1.591	7.087 (180.00)	0.16 (4.06)	7.48 (190.0)	0.96 (24.38)	8.464 (214.99)	0.551 (14.00)	THRU
GMB75120-XXX-E	162.0 (73.5)	20.59 (523.0)	7.48 (190.0)	2.28 (57.9)	1.875 (47.63)	.500 SQ (12.70)	1.581- 1.591	7.087 (180.00)	0.16 (4.06)	7.48 (190.0)	0.96 (24.38)	8.464 (214.99)	0.551 (14.00)	THRU

Note: Dimensions are in inches, (mm)

# GMB & GMBF SHAFT LOAD RATINGS

Motor Frame Size	Radial Shaft Load		Axial Shaft Load	
	Lbs	N	Lbs	N
<b>GMB2000</b>	30	130	15	65
<b>GMB3500</b>	70	310	25	110
<b>GMBF4300</b>	70	310	25	110
<b>GMB4500</b>	100	440	50	220
<b>GMBF5000</b>	100	440	50	220
<b>GMB5600</b>	150	670	50	220
<b>GMB7500</b>	250	1100	100	440

**Note:** This table is for general guidance only. Shaft load ratings are approximations and will vary with shaft diameter, the location of the load on the shaft, speed (RPM), bearings, and more. The values in the table are for a load located 1" (25.4 mm) from the mounting face of the motor and at 3000 RPM.

## GMB & GMBF CONNECTORS & PINOUT INFORMATION

### 4-Pin MS Connector (Motor Power)

For GMB5600 motors:

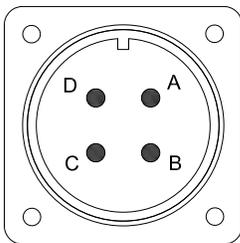
Connector PN: MS-3102R22-22P

Straight Mating Connector PN: MS3106F22-22S

For GMB7500 motors:

Connector PN: MS-3102R32-17P

Straight Mating Connector PN: MS3106F32-17S



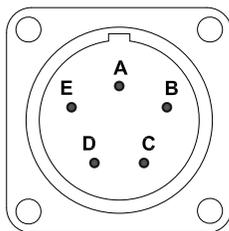
Pin #	Function
<b>A</b>	Phase R
<b>B</b>	Phase S
<b>C</b>	Phase T
<b>D</b>	Case Ground

### 5-Pin MS Connector (Motor Power)

For GMB2000, GMB3500, GMB4500, GMBF4300, and GMBF5000 motors:

Connector PN: MS-3112E14-5P

Straight Mating Connector PN: MS3116F14-5S



Pin #	Function
<b>A</b>	Phase R
<b>B</b>	Phase S
<b>C</b>	Phase T
<b>D</b>	Case Ground
<b>E</b>	N/C

**Note:** Non-standard connectors and pinouts are available upon request. Contact Glentek for more information.

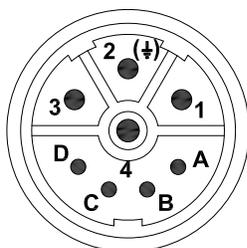
# GMB & GMBF CONNECTORS & PINOUT INFORMATION

## 8-Pin Euro-Style Connector (Motor Power and Brake)

For GMB2000, GMB3500, GMBF4300, GMB4500, and GMBF5000 motors. Contact Glentek for larger frame sizes.

TE Connector PN: BEDC110MR11001216 000

TE Mating Connector PN (fully threaded): BSTA078FR05480235000



Pin #	Function
1	Phase R
2	Case Ground
3	Phase S
4	Phase T
A	Brake +
B	Brake -
C	N/C
D	N/C

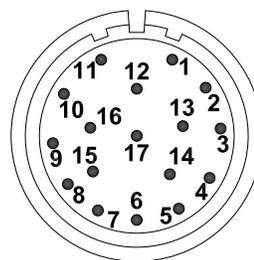
## 17-Pin Euro-Style Connector (Feedback)

Available for all GMB and GMBF motors.

TE Connector PN: AEDC139MR04001215000

TE Mating Connector PN (fully threaded):

ASTA014FR1590038000



Pin #	Resolver	Incremental (TTL) Quadrature Encoder	Sin/Cos Encoder	Absolute Encoder w/ Sin/Cos Tracks	Absolute Encoder w/o Sin/Cos Tracks
1	Cosine+	Channel B+	Cosine+	B+ / Cosine+	N/C
2	Cosine-	Channel B-	Cosine-	B- / Cosine-	N/C
3	Sine+	Channel A+	Sine+	A+ / Sine+	N/C
4	Sine-	Channel A-	Sine-	A- / Sine-	N/C
5	Excitation	Channel Z+	Channel Z+	Battery Common	Battery Common
6	Excitation Common	Channel Z-	Channel Z-	Battery +5 VDC	Battery +5 VDC
7	N/C	Common	Common	Common	Common
8	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch
9	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch
10	N/C	+5 VDC	+5 VDC	+5 VDC	+5 VDC
11	N/C	Hall U-	Hall U-	Data-	Data-
12	N/C	Hall V-	Hall V-	Clock-	N/C
13	N/C	Hall W-	Hall W-	N/C	N/C
14	N/C	N/C	N/C	N/C	N/C
15	N/C	Hall U+	Hall U+	Data+	Data+
16	N/C	Hall V+	Hall V+	Clock+	N/C
17	N/C	Hall W+	Hall W+	N/C	N/C

**Note:** Pin functionality may vary due to the features available on the feedback device. Non-standard connectors and pinouts are available upon request. Contact Glentek for more information.

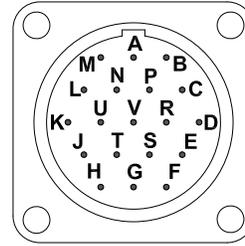
# GMB & GMBF CONNECTORS, PIN-OUT, & BRAKE INFO

## 19-Pin MS Connector (Feedback and Brake)

Available for all GMB and GMBF motors.

Connector PN: MS-3112E14-19P

Straight Mating Connector PN: MS3116F14-19S



Pin #	Resolver	Incremental (TTL) Quadrature Encoder	Sin/Cos Encoder	Absolute Encoder w/ Sin/Cos tracks	Absolute Encoder w/o Sin/Cos tracks
<b>A</b>	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch
<b>B</b>	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch	Temp. Switch
<b>C</b>	Resolver Shield	Encoder Shield	Encoder Shield	Encoder Shield	Encoder Shield
<b>D</b>	N/C	+5 VDC	+5 VDC	+5 VDC	+5 VDC
<b>E</b>	N/C	Common	Common	Common	Common
<b>F</b>	Cosine -	Channel A+	Sine+	Sine+	N/C
<b>G</b>	Cosine +	Channel A-	Sine-	Sine-	N/C
<b>H</b>	Sine -	Channel B+	Cosine+	Cosine+	N/C
<b>J</b>	Sine +	Channel B-	Cosine-	Cosine-	N/C
<b>K</b>	Excitation Common	Channel Z+	Channel Z+	Battery Common	Battery Common
<b>L</b>	Excitation	Channel Z-	Channel Z-	Battery +5 VDC	Battery +5 VDC
<b>M</b>	N/C	Hall U+	Hall U+	Data+	Data+
<b>N</b>	N/C	Hall U-	Hall U-	Data-	Data-
<b>P</b>	N/C	Hall V+	Hall V+	Clock+	N/C
<b>R</b>	N/C	Hall V-	Hall V-	Clock-	N/C
<b>S</b>	N/C	Hall W+	Hall W+	N/C	N/C
<b>T</b>	N/C	Hall W-	Hall W-	N/C	N/C
<b>U</b>	Brake +	Brake +	Brake +	Brake +	Brake +
<b>V</b>	Brake -	Brake -	Brake -	Brake -	Brake -

**Note:** Non-standard connectors and pinouts are available upon request. Contact Glentek for more information.

## BRAKE INFORMATION

Model Number	Extension	Torque		Power	Current	Resistance	Inductance
	in. (mm)	Lb-in	Nm	Watts	A	$\Omega$	mH
<b>GMB2000</b>	1.37 (35)	18	2	11	0.5	52	95
<b>GMB3500</b>	1.46 (37)	80	9	18	0.8	33	115
<b>GMB4500</b>	2.51 (64)	160	18	24	1.0	24	100
<b>GMB5600</b>	2.25 (57)	318	36	26	1.1	22	130
<b>GMB7500</b>	3.00 (76)	1283	145	50	2.1	11	110
<b>GMBF4300</b>	1.63 (41)	80	9	18	0.8	33	115
<b>GMBF5000</b>	1.25 (32)	160	18	24	1.0	24	100

**Note:**

Brakes are optional. All brakes require 24 VDC voltage input. 95 VDC brakes available upon request. The values for "Extension" represent the nominal maximum length that the brake will add to the motor. For some models, the extension will be less. Please contact one of our sales engineers for the exact values.

# GMB & GMBF SERIES MODEL NUMBERING



Magnet Type	
	Leave blank for rare earth (NdFeB) magnets
<b>F</b>	Ferrite magnets

Frame Size			
<b>20</b>	2.0" (4 pole)	<b>50</b>	5.0" (8 pole)
<b>35</b>	3.5" (6 pole)	<b>56</b>	5.6" (6 pole)
<b>43</b>	4.3" (6 pole)	<b>75</b>	7.5" (6 pole)
<b>45</b>	4.5" (4/6 pole)	-	-

Stack Length
Listed in tenths of inches i.e. 10 = 1.0 inch stack. Refer to Selection Table.

Back EMF Constant
Refer to selection table. For custom Back EMF, please contact Glentek.

Dimensions			
<b>E</b>	English	<b>M</b>	Metric
		<b>N</b>	NEMA

Brake Option			
<b>0</b>	No brake installed	<b>1</b>	24 VDC Brake
		<b>2</b>	Special

Commutation Device			
<b>0</b>	Brushless Resolver	<b>2</b>	Encoder with commutation tracks
<b>1</b>	Hall Effect Sensors	<b>3</b>	Special
		<b>4</b>	Absolute Encoder
		<b>5</b>	Sin/Cos Encoder

Number of Motor Poles			
<b>0</b>	2 Pole	<b>3</b>	8 Pole
<b>1</b>	4 Pole	<b>4</b>	10 Pole
<b>2</b>	6 Pole	<b>5</b>	12 Pole
		-	Special

Flange Type			
<b>0</b>	Standard	<b>3</b>	NEMA 34 (3.2" and 3.5" frame motors only)
<b>1</b>	Special	<b>4</b>	NEMA 42 (4.3" and 4.5" frame motors only)
<b>2</b>	NEMA 23 (2.0" frame motors only)	<b>5</b>	NEMA 56C (4.3", 4.5", and 5.0" frame motors only)

Shaft Type			
<b>0</b>	Standard	<b>3</b>	NEMA 34 (3.2" and 3.5" frame motors only)
<b>1</b>	Special	<b>4</b>	NEMA 42 (4.3" and 4.5" frame motors only)
<b>2</b>	NEMA 23 (2.0" frame motors only)	<b>5</b>	NEMA 56C (4.3", 4.5", and 5.0" frame motors only)

Lead Termination			
<b>0</b>	One MS connector	<b>3</b>	Special
<b>1</b>	Two MS connectors	<b>4</b>	Liquid tight strain relief with flying leads
<b>2</b>	NPT(s) only with flying leads	<b>5</b>	Euro-style connectors

Wiring Diagram (MS connector lead termination only)	
<b>0</b>	Glentek Standard
<b>1</b>	Special

Encoder Option					
<b>0</b>	No encoder installed	<b>4</b>	1250 PPR	<b>8</b>	8192 PPR
<b>1</b>	500 PPR	<b>5</b>	2000 PPR	<b>9</b>	5000 PPR
<b>2</b>	1000 PPR	<b>6</b>	2500 PPR	<b>A</b>	512 PPR
<b>3</b>	1024 PPR	<b>7</b>	Special	<b>B</b>	2048 PPR
				<b>C</b>	4096 PPR
				<b>D</b>	3600 PPR
				<b>E</b>	18000 PPR
				<b>G</b>	23 bit ST + 16 bit MT

Factory Assigned Option
A numerical code will be assigned by Glentek to motors whose specifications vary from the standard configuration

# DC BRUSH SERVO MOTORS

To accommodate your complete servo system requirements, Glentek manufactures two complete series (GM and GMR) of high performance, permanent magnet DC brush servo motors. Following is a general description of each series:

## GM SERIES

The GM series utilize traditional ferrite magnets, which are ideal for cost sensitive applications. In addition, the higher inertia armatures provide improved motor to load inertia matching for medium to high inertia loads. This helps to reduce the mechanical shaft resonance, which allows higher servo gains with increased stability. All frame sizes incorporate skewed armatures, which provide ultra smooth operation (i.e. low cogging torque) at all speeds.

- Continuous Torque Range:  
1.9 Lb-in (0.21 Nm) to 113 Lb-in (12.8 Nm)
- Peak Torque Range:  
12.0 Lb-in (1.4 Nm) to 338 Lb-in (38.1 Nm)

## GMR SERIES

The GMR series utilize high-energy Neodymium-Iron-Boron (NdFeB) magnets, which provide more torque in a smaller package with higher dynamic performance than traditional ferrite magnet designs. Due to the high torque to inertia ratio of these motors, they are ideal for applications which require high acceleration and deceleration characteristics or where the physical size of the motor is a major concern.

- Continuous Torque Range:  
16.0 Lb-in (1.81 Nm) to 65.0 Lb-in (7.34 Nm)
- Peak Torque Range:  
80.0 Lb-in (9.04 Nm) to 325.0 Lb-in (36.72 Nm)

## FEATURES

- High-energy Neodymium-Iron-Boron (NdFeB) magnet design provides more torque in a smaller package with higher dynamic performance. (GMR series)
- Skewed armature design provides ultra smooth operation (i.e. low cogging torque) at all speeds.
- Constructed to withstand the toughest industrial environment with rugged, high performance bearings and TENV construction with IP54 sealing standard. Optional IP65 sealing is available on 3.3", 4.0", 4.9" and 6.0" frame motors.
- Various electrical windings are available as standard to suit both low and high voltage drives in order to provide optimum speed and torque characteristics. Optional custom electrical windings are available to meet virtually any requirement.
- Worldwide standard mounting configurations are available. Optional custom mounting configurations are available to meet virtually any requirement.
- Industry standard lead termination configurations. (i.e. MS connectors, fluid tight strain relief cable exit, NPT hole with flying leads and terminal boxes)
- Optional industry standard feedback devices. (i.e. high performance silver commutator tachometers, encoders and resolvers)
- Shaft keyway standard. (Contact Glentek for more options)
- Class H insulation standard.
- Optional 24VDC holding brakes are available.
- UL Recognized Components for the US and Canada in accordance with UL 1004-1.
- CE marked in accordance with EN61000-6-4:2007/A1:2011.
- RoHS compliant.

### Environmental Conditions

Storage Temperature: -20°C to 70°C

Operating Temperature: Standard: -20°C to 40°C without derating, derate torque 10% per 10°C above 40°C  
Special: -40°C to 40°C without derating, derate torque 10% per 10°C above 40°C

Humidity: 5% to 95% relative humidity, non-condensing

Altitude: Up to 1000m without derating, derate torque 10% per 1000m above 1000m



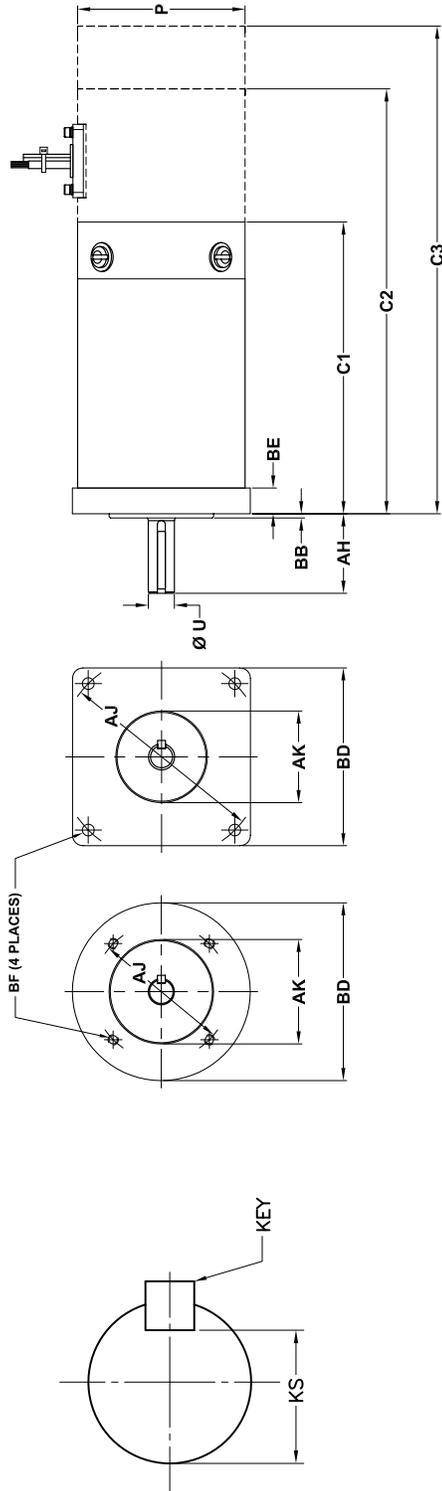
# GM & GMR SERIES SELECTION TABLE

Model Number	Power @ Max Speed		Cont. Stall Rating		Peak Stall Rating		K <sub>T</sub>		R <sub>A</sub>	L <sub>A</sub>	RPM	K <sub>V</sub>	Armature Inertia	
	HP	KW	Lb-in	Nm	Amps	Nm	Lb-in	Amps	Ω	mH	Max	V/Krpm	Lb-in-sec <sup>2</sup>	Kg-m <sup>2</sup>
GM2320-7	0.12	0.090	1.9	0.21	3.0	1.07	9.5	15.0	1.6	3.3	4000	7.4	0.00023	0.00026
GM2320-16	0.12	0.090	1.9	0.21	1.4	1.07	9.5	7.0	11.7	11.0	4000	16	0.00023	0.00026
GM2340-8	0.25	0.186	3.1	0.35	5.0	1.75	15.5	25.0	0.9	2.5	5000	7.5	0.00040	0.00045
GM2340-11	0.20	0.149	3.1	0.35	3.3	1.75	15.5	16.5	1.0	2.7	4000	11	0.00040	0.00045
GM2340-15	0.20	0.149	3.1	0.35	2.5	1.75	15.5	12.5	2.8	5.0	4000	15	0.00040	0.00045
GM3310-25	0.24	0.179	4.4	0.50	2.1	2.50	22.0	10.5	6.5	9.0	3400	25	0.00192	0.000217
GM3320-22	0.42	0.313	7.5	0.85	4.4	4.24	37.5	22.0	2.1	4.0	3500	22	0.00208	0.000235
GM3320-30	0.38	0.283	7.5	0.85	3.0	4.24	37.5	15.0	3.2	9.0	3200	30	0.00208	0.000235
GM3330-12	0.58	0.435	9.2	1.04	8.8	5.20	46.0	43.8	0.5	0.5	4000	12.8	0.00310	0.000350
GM3330-30	0.47	0.348	9.2	1.04	3.6	5.20	46.0	18.2	1.9	2.9	3200	30	0.00310	0.000350
GM3330-41	0.29	0.218	9.2	1.04	2.6	5.20	46.0	13.1	3.2	7.6	2000	41	0.00310	0.000350
GM3340-22	0.59	0.440	10.6	1.20	6.3	5.99	53.0	31.5	1.0	2.0	3500	22	0.00310	0.000350
GM3340-27	0.56	0.414	10.6	1.20	4.7	5.99	53.0	23.6	1.3	2.4	3300	27	0.00310	0.000350
GM3340-30	0.54	0.403	10.6	1.20	4.2	5.99	53.0	21.0	2.0	2.7	3200	30	0.00310	0.000350
GMR3340-27	0.84	0.627	16	1.81	7.1	9.05	80.0	35.5	0.9	1.3	3300	27	0.00310	0.000350
GMR3340-30	0.81	0.604	16	1.81	6.3	9.05	80.0	31.5	1.4	1.4	3200	30	0.00310	0.000350
GM4010-20	0.83	0.619	13	1.47	7.7	7.35	65.0	38.5	0.8	3.0	4000	20	0.00700	0.000791
GM4010-30	0.76	0.567	13	1.47	5.1	7.35	65.0	25.5	1.8	7.5	3700	30	0.00700	0.000791
GM4020-25	1.46	1.089	23	2.60	11.0	13.00	115.0	55.0	0.8	3.6	4000	25	0.00920	0.001040
GM4020-39	1.28	0.955	23	2.60	6.6	13.00	115.0	33.0	1.3	7.4	3500	39	0.00920	0.001040
GM4020-60	0.80	0.597	23	2.60	4.6	13.00	115.0	23.0	2.3	9.6	2200	60	0.00920	0.001040
GM4040-20	1.98	1.477	31	3.54	18.4	17.70	156.5	92.0	0.6	2.2	4000	20	0.01630	0.001842
GM4040-41	1.74	1.298	31	3.54	9.1	17.70	156.5	45.5	0.8	5.6	3500	41	0.01630	0.001842
GM4040-60	1.09	0.813	31	3.54	6.2	17.70	156.5	31.0	1.5	6.8	2200	60	0.01630	0.001842
GM4050-38	2.29	1.708	41	4.67	12.9	23.35	206.5	64.5	0.6	4.4	3500	38	0.01980	0.002237
GM4050-60	1.44	1.074	41	4.67	8.2	23.35	206.5	41.0	0.9	5.3	2200	60	0.01980	0.002237
GM4060-41	2.83	2.11	51	5.78	14.9	28.90	256.0	74.5	0.7	4.6	3500	41	0.02800	0.003164
GMR4910-26	1.21	0.903	19	2.15	8.6	10.75	95.0	43.0	0.8	2.3	4000	26	0.00600	0.000678
GMR4910-37	1.12	0.835	19	2.15	5.9	10.75	95.0	29.5	1.4	4.3	3700	37	0.00600	0.000678
GMR4920-38	2.06	1.537	35	3.95	10.8	19.75	175.0	54.0	0.5	1.5	3700	38	0.00900	0.001017
GMR4920-68	1.17	0.873	35	3.95	6.0	19.75	175.0	30.0	1.9	5.3	2100	68	0.00900	0.001017
GMR4940-38	3.02	2.253	50	5.65	15.2	28.25	250.0	76.0	0.3	1.0	3800	38	0.01500	0.001695
GMR4940-78	1.34	0.999	50	5.65	6.6	28.25	250.0	33.0	2.2	10.8	1700	78	0.01500	0.001695
GMR4950-35	4.13	3.081	65	7.34	21.4	36.70	325.0	107.0	0.2	0.7	4000	35	0.01600	0.001808
GMR4950-57	2.58	1.924	65	7.34	13.4	36.70	325.0	67.0	0.6	1.6	2500	57	0.01600	0.001808
GM6060-39	3.57	2.663	75	8.47	22.8	42.35	375.0	114.0	0.3	0.95	3000	39	0.05300	0.005989
GM6060-50	2.98	2.223	75	8.47	17.8	42.35	375.0	89.0	0.8	1.8	2500	50	0.05300	0.005989
GM6060-70	2.14	1.596	75	8.47	12.5	42.35	375.0	62.4	1.2	3.5	1800	70	0.05300	0.005989
GM6060-96	1.79	1.335	75	8.47	9.3	42.35	375.0	46.5	1.4	6.6	1500	96	0.05300	0.005989
GM6090-50	4.46	3.327	113	12.77	26.7	63.85	565.0	133.5	0.4	1.0	2500	50	0.08000	0.009040

**Note:** All ratings are based on a 40°C ambient temperature and with the motor face mounted to a 12" x 12" x 1/2" aluminum heatsink.

K<sub>T</sub> = Torque Constant • K<sub>V</sub> = B<sub>EMF</sub> = Volts/1000 RPM • L<sub>A</sub> = Inductance • Please visit our website at [www.glentek.com](http://www.glentek.com) for performance curves and more detailed information

# GM & GMR SERIES DIMENSIONS



Model Number	Lbs (Kg)	C1		C2		C3		P		Shaft		Flange/Face				Mounting Hole		
		RND	SQR	RND	SQR	RND	SQR	(max)	AH	U (max)	KEY	KS	AJ	AK	BB	BD	BE (max)	BF Dia.
<b>GM2320</b>	3.0 (1.4)	3.69 (93.73)	5.68 (144.3)	7.04 (178.82)	7.04 (178.82)	7.04 (178.82)	7.04 (178.82)	2.25 (57.15)	1.00 (25.40)	0.2500 (6.35)		1.531 (38.89)	1.000 (25.40)	0.10 (2.54)	2.00 (50.80)	0.30 (7.62)		6-32 x.38
<b>GM2340</b>	4.0 (1.8)	5.30 (134.62)	7.29 (185.2)	8.65 (219.71)	8.65 (219.71)	8.65 (219.71)	8.65 (219.71)	2.25 (57.15)	1.00 (25.40)	0.2500 (6.35)		1.531 (38.89)	1.000 (25.40)	0.10 (2.54)	2.00 (50.80)	0.30 (7.62)		6-32 x.38
<b>Square Flange</b>								2.25 (57.15)	1.00 (25.40)	0.2500 (6.35)		2.625 (66.68)	1.500 (38.10)	0.10 (2.54)	2.25 (57.15)	0.30 (7.62)	0.213 (5.41)	THRU
<b>NEMA 23</b>								2.25 (57.15)	0.81 (20.57)	0.2500 (6.35)		2.625 (66.68)	1.500 (38.10)	0.10 (2.54)	2.25 (57.15)	0.30 (7.62)	0.213 (5.41)	THRU
<b>GM3310</b>	5.0 (2.3)	3.72 (94.49)	6.45 (163.83)	7.71 (195.83)	6.71 (170.43)	7.97 (202.44)	7.97 (202.44)	3.25 (82.55)	1.87 (47.50)	0.5000 (12.70)	.125 SQ. (3.18)	2.500* (63.50)	3.000 (76.20)	0.37 (9.40)	3.25 (82.55)	0.22 (5.6)		10-32 x.50
<b>GM3320</b>	7.0 (3.2)	4.34 (110.24)	7.07 (179.58)	8.33 (211.58)	7.34 (186.44)	8.60 (218.44)	8.60 (218.44)	3.25 (82.55)	1.87 (47.50)	0.5000 (12.70)	.125 SQ. (3.18)	2.500* (63.50)	3.000 (76.20)	0.37 (9.40)	3.25 (82.55)	0.22 (5.6)		10-32 x.50
<b>GM3330</b>	8.0 (3.6)	5.65 (143.51)	8.38 (212.85)	9.64 (244.86)	8.65 (219.71)	9.91 (251.71)	9.91 (251.71)	3.25 (82.55)	1.87 (47.50)	0.5000 (12.70)	.125 SQ. (3.18)	2.500* (63.50)	3.000 (76.20)	0.37 (9.40)	3.25 (82.55)	0.22 (5.6)		10-32 x.50
<b>GM3340</b>	10.0 (4.5)	6.31 (160.27)	9.04 (229.62)	10.30 (261.62)	9.30 (236.22)	10.56 (268.22)	10.56 (268.22)	3.25 (82.55)	1.87 (47.50)	0.5000 (12.70)	.125 SQ. (3.18)	2.500* (63.50)	3.000 (76.20)	0.37 (9.40)	3.25 (82.55)	0.22 (5.6)		10-32 x.50
<b>GMR3340</b>	10.0 (4.5)	5.98 (151.89)	8.71 (221.23)	9.97 (253.24)	8.61 (218.69)	9.87 (250.70)	9.87 (250.70)	3.25 (82.55)	1.87 (47.50)	0.5000 (12.70)	.125 SQ. (3.18)	2.500* (63.50)	3.000 (76.20)	0.37 (9.40)	3.25 (82.55)	0.22 (5.6)		10-32 x.50
<b>Square Flange</b>								3.25 (82.55)	1.60 (40.64)	0.5000 (12.70)	X 1.00 (25.40)	3.875 (98.43)	2.875 (73.03)	0.10 (2.54)	3.25 (82.55)	0.48 (12.19)	0.220 (5.59)	THRU
<b>NEMA 34</b>								3.25 (82.55)	1.19 (30.23)	0.3750 (9.53)		3.875 (98.43)	2.875 (73.03)	0.10 (2.54)	3.38 (85.85)	0.48 (12.19)	0.220 (5.59)	THRU
<b>GM4010</b>	8.0 (3.6)	5.25 (133.35)	7.26 (184.40)	8.39 (213.11)	7.26 (184.40)	8.39 (213.11)	8.39 (213.11)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.507- (12.87)	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)		1/4-20 x.50
<b>GM4020</b>	12.0 (5.5)	6.56 (166.62)	8.57 (217.68)	9.70 (246.38)	8.57 (217.68)	9.70 (246.38)	9.70 (246.38)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	X 1.50 (38.10)	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)		1/4-20 x.50

**C1 = Bare motor, C2 = Motor with tachometer OR encoder, C3 = Motor with tachometer AND Encoder.**

**Note:** Dimensions are in inches (mm), \*GM33xx Round Flange, AJ is less than AK

# GM & GMR SERIES DIMENSIONS

Model Number	Lbs (Kg)		C1		C2		C3		P		Shaft			Flange/Face				Mounting Hole				
			RND	SQR	RND	SQR	RND	SQR	RND	SQR	(max)	AH	U (max)	KEY	KS	AJ	AK	BB	BD	BE (max)	BF Dia.	Tap
<b>GM4040</b>	17.0 (7.7)		8.63 (219.20)		10.64 (270.26)		11.77 (298.96)		4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>GM4050</b>	20.0 (9.1)		9.63 (244.60)		11.64 (295.66)		12.77 (324.36)		4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>GM4060</b>	23.0 (10.5)		10.40 (264.16)		12.41 (315.21)		13.54 (343.92)		4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>M1 (Square)</b>									4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	4.950 (125.73)	2.187 (55.55)	0.06 (1.52)	4.25 (107.95)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>M2 (Square)</b>									4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.741 (145.82)	3.000 (76.20)	0.10 (2.54)	5.00 (127.00)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>M3 (Square)</b>									4.00 (101.60)	4.00 (101.60)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.875 (149.23)	4.500 (114.30)	0.10 (2.54)	5.00 (127.00)	0.44 (11.18)	0.44 (11.18)		3/8-16 THRU
<b>NEMA 42</b>									4.00 (101.60)	4.00 (101.60)	1.32 (33.5)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	4.950 (125.73)	2.187 (55.55)	0.06 (1.52)	4.25 (107.95)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>NEMA 56C</b>									4.00 (101.60)	4.00 (101.60)	2.06 (52.32)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.875 (149.23)	4.500 (114.30)	0.09 (2.29)	6.50 (165.10)	0.44 (11.18)	0.44 (11.18)		3/8-16 THRU
<b>GMR4910</b>	18.0 (8.2)		8.10 (205.7)		8.10 (205.7)		11.28 (286.5)		4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>GMR4920</b>	23.0 (10.5)		9.20 (233.7)		9.20 (233.7)		12.38 (314.5)		4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>GMR4940</b>	28.0 (12.7)		11.60 (294.6)		11.60 (294.6)		14.78 (375.4)		4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>GMR4950</b>	32.0 (14.5)		12.60 (320.0)		12.60 (320.0)		15.78 (400.8)		4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	3.250 (82.55)	2.498 (63.45)	0.10 (2.54)	4.00 (101.60)	0.62 (15.7)	0.62 (15.7)		1/4-20 x.50
<b>M1 (Square)</b>									4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	4.950 (125.73)	2.187 (55.55)	0.06 (1.52)	4.25 (107.95)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>M2 (Square)</b>									4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.741 (145.82)	3.000 (76.20)	0.10 (2.54)	5.00 (127.00)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>M3 (Square)</b>									4.90 (124.46)	4.90 (124.46)	1.90 (48.26)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.875 (149.23)	4.500 (114.30)	0.10 (2.54)	5.00 (127.00)	0.44 (11.18)	0.44 (11.18)		3/8-16 THRU
<b>NEMA 42</b>									4.00 (101.60)	4.00 (101.60)	1.32 (33.5)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	4.950 (125.73)	2.187 (55.55)	0.06 (1.52)	4.25 (107.95)	0.44 (11.18)	0.44 (11.18)	0.281 (7.14)	THRU
<b>NEMA 56C</b>									4.90 (124.46)	4.90 (124.46)	2.06 (52.32)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.875 (149.23)	4.500 (114.30)	0.09 (2.29)	6.50 (165.10)	0.44 (11.18)	0.44 (11.18)		3/8-16 THRU
<b>GM6060</b>	41.0 (18.6)		13.92 (353.57)		13.92 (353.57)		17.10 (434.34)		5.65 (143.51)	5.65 (143.51)	1.70 (43.18)	0.8750 (22.23)	.188 SQ. X 1.50	.761- .771	3.750 (95.25)	3.000 (76.20)	0.09 (2.29)	5.12 (130.05)	0.44 (11.18)	0.44 (11.18)		3/8-16 x.50
<b>GM6090</b>	56.0 (25.5)		16.92 (429.77)		16.92 (429.77)		20.10 (510.54)		5.65 (143.51)	5.65 (143.51)	1.70 (43.18)	0.8750 (22.23)	.188 SQ. X 1.50	.761- .774	3.750 (95.25)	3.000 (76.20)	0.09 (2.29)	5.12 (130.05)	0.44 (11.18)	0.44 (11.18)		3/8-16 x.50
<b>Square Flange</b>									5.65 (143.51)	5.65 (143.51)	1.70 (43.18)	0.8750 (22.23)	.188 SQ. X 1.50	.761- .774	5.875 (149.23)	3.000 (76.20)	0.09 (2.29)	5.17 (131.32)	0.44 (11.18)	0.44 (11.18)	0.406 (10.31)	THRU
<b>NEMA 56C</b>									5.65 (143.51)	5.65 (143.51)	2.06 (52.32)	0.6250 (15.88)	.188 SQ. X 1.50	.507- .517	5.875 (149.23)	4.500 (114.30)	0.09 (2.29)	6.50 (165.10)	0.44 (11.18)	0.44 (11.18)		3/8-16 THRU

**C1 = Bare motor, C2 = Motor with tachometer OR encoder, C3 = Motor with tachometer AND Encoder.**

Note: Dimensions are in inches (mm), \*GM33xx Round Flange, AJ is less than AK

# GM & GMR CONNECTORS & PINOUT INFORMATION

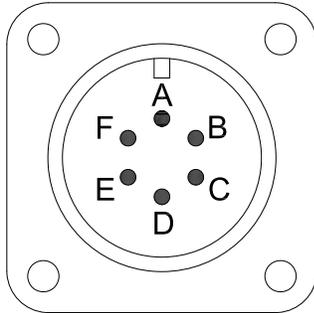
## 6-Pin MS Connector (Motor Power, Tachometer Feedback, Optional Brake)

For all GM and GMR motors:

6-Pin MS Connector PN: MS3102R-14S-6P

Straight Mating Connector PN: MS3106F-14S-6S

90 Degree Mating Connector PN: MS3108E-14S-6S



Pin #	Function - With Brake	Function - Without Brake
<b>A</b>	Motor +	Motor +
<b>B</b>	Motor -	Motor -
<b>C</b>	Tachometer +	Tachometer +
<b>D</b>	Tachometer -	Tachometer -
<b>E</b>	Brake +	Tachometer Cable Shield
<b>F</b>	Brake -	N/C

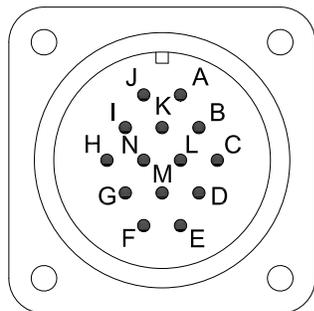
## 14-Pin MS Connector (Motor Power, Tachometer Feedback and Resolver or Encoder Feedback)

For all GM and GMR motors:

14-Pin MS Connector, MS3102R-20-27P

Straight Mating Connector, MS3106F-20-27S

90 Degree Mating Connector, MS3108E-20-27S



Pin #	Function - Resolver	Function - Encoder
<b>A</b>	Sine +	Channel A+
<b>B</b>	Sine -	Channel A-
<b>C</b>	Cosine +	Channel B+
<b>D</b>	Cosine -	Channel B-
<b>E</b>	Excitation	Channel Z+
<b>F</b>	Excitation Common	Channel Z-
<b>G</b>	N/C	+5 VDC
<b>H</b>	N/C	Common
<b>I</b>	N/C	Cable Shield
<b>J</b>	Tachometer +	Tachometer +
<b>K</b>	Tachometer -	Tachometer -
<b>L</b>	Tachometer Cable Shield	Tachometer Cable Shield
<b>M</b>	Motor -	Motor -
<b>N</b>	Motor +	Motor +

### Notes:

- For all GM2300, GM3300, and GMR3300 motors:  
With a positive voltage applied to the red motor lead (Pin N or A) with respect to the black motor lead (Pin P, M, or B), the motor drive shaft will turn in the clockwise direction as viewed from the shaft end.
- For all GM4000, GMR4900, and GM6000 motors:  
With a positive voltage applied to the red motor lead (Pin N or A) with respect to the black motor lead (Pin P, M, or B), the motor drive shaft will turn in the counter-clockwise direction as viewed from the shaft end.
- Non-standard connectors and pinouts available are upon request. Contact Glentek for more information.

# GM & GMR CONNECTORS & PINOUT INFORMATION

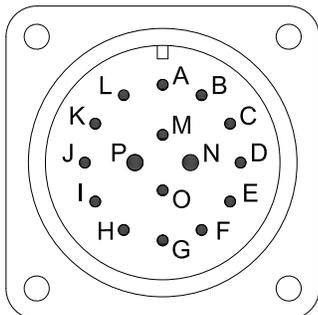
## 16-Pin MS Connector (Motor Power, Tachometer Feedback, Brake, and Resolver or Encoder Feedback)

For all GM and GMR motors:

16-Pin MS Connector, MS3102R-24-07P

Straight Mating Connector, MS3106F-24-07S

90 Degree Mating Connector, MS3108E-24-07S



Pin #	Function - Resolver	Function - Encoder
<b>A</b>	Sine +	Channel A+
<b>B</b>	Sine -	Channel A-
<b>C</b>	Cosine +	Channel B+
<b>D</b>	Cosine -	Channel B-
<b>E</b>	Excitation	Channel Z+
<b>F</b>	Excitation Common	Channel Z-
<b>G</b>	N/C	+5 VDC
<b>H</b>	N/C	Common
<b>I</b>	N/C	Cable Shield
<b>J</b>	Tachometer +	Tachometer +
<b>K</b>	Tachometer -	Tachometer -
<b>L</b>	Tachometer Cable Shield	Tachometer Cable Shield
<b>M</b>	Brake +	Brake +
<b>N</b>	Motor +	Motor +
<b>O</b>	Brake -	Brake -
<b>P</b>	Motor -	Motor -

### Notes:

- For all GM2300, GM3300, and GMR3300 motors:  
With a positive voltage applied to the red motor lead (Pin N or A) with respect to the black motor lead (Pin P, M, or B), the motor drive shaft will turn in the clockwise direction as viewed from the shaft end.
- For all GM4000, GMR4900, and GM6000 motors:  
With a positive voltage applied to the red motor lead (Pin N or A) with respect to the black motor lead (Pin P, M, or B), the motor drive shaft will turn in the counter-clockwise direction as viewed from the shaft end.
- Non-standard connectors and pinouts are available upon request. Contact Glentek for more information.

## GM & GMR SHAFT LOAD RATINGS

Motor Frame Size	Radial Shaft Load		Axial Shaft Load	
	Lbs	N	Lbs	N
<b>GM2300</b>	30	130	15	65
<b>GM3300</b>	50	220	25	110
<b>GMR3300</b>	50	220	25	110
<b>GM4000</b>	100	440	40	180
<b>GMR4900</b>	100	440	40	180
<b>GM6000</b>	150	670	50	220

**Note:** This table is for general guidance only. Shaft load ratings are approximations and will vary with shaft diameter, the location of the load on the shaft, speed (RPM), bearings, and more. The values in the table are for a load located 1" (25.4 mm) from the mounting face of the motor and at 3000 RPM.

## GM & GMR BRAKE INFORMATION

Motor Frame Size	Extension	Torque		Power	Current	Resistance	Inductance
	in. (mm)	Lb-in	Nm	Watts	A	$\Omega$	mH
<b>GM2300</b>	1.70 (43)	18	2.0	11	0.5	52	95
<b>GM3300</b>	1.91 (49)	40	4.5	12	0.5	47	145
<b>GM4000</b>	2.44 (62)	160	18	24	1.0	24	100
<b>GM6000</b>	2.63 (67)	160	18	24	1.0	24	100
<b>GMR3300</b>	1.98 (50)	80	9.0	18	0.7	33	110
<b>GMR4900</b>	2.19 (56)	160	18	24	1.0	24	100

**Note:**

Brakes are optional. All brakes require 24 VDC input voltage. The values for "Extension" represent the nominal maximum length that the brake will add to the motor. For some models, the extension will be less. Please contact one of our sales engineers for the exact values.





# **GLENTTEK**

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