

# GLENTEK BRUSHLESS SERVO MOTORS GMB5600 SERIES

Revision: 4/10/2020



Glentek's GMB5600 series of high performance, permanent magnet Brushless servo motors 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. In addition, due to 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:  
130 Lb-in (14.7 Nm) to 360 Lb-in (40.7 Nm)
- Peak Torque Range:  
390 Lb-in (44.1 Nm) to 1080 Lb-in (122.1 Nm)

## GMB5600 SERIES FEATURES

High-energy Neodymium-Iron-Boron (NdFeB) magnet design with low inertia rotors provides a high dynamic performance.
Special design provides ultra smooth operation (i.e. low cogging torque) at all speeds.
Worldwide standard mounting configurations are available (English and Metric). Optional custom mounting configurations are available to meet virtually any requirement.
Normally closed thermal switch provides over temperature protection.
Encoder with commutation tracks, brushless resolvers or Hall sensors are standard feedback devices offered
Various electrical windings are available as standard to suit both low (120 VAC) and high (230 VAC and 460 VAC) voltage drives in order to provide optimum speed and torque characteristics. Optional custom electrical windings are available.
Shaft Keyway.
Class H insulation standard.
Standard operating temperature is dependent on the feedback device installed. Motors with resolver feedback can be specially configured to operate down to -40°C.
Optional 24VDC holding brakes are available.
Constructed to withstand the toughest industrial environment with rugged, high performance bearings and TENV construction with IP65 sealing standard
RoHS compliant.
CE marked.
UL Recognized Component for US and Canada.

## GMB5600 SERIES ENVIRONMENTAL CONDITIONS

<b>Storage Temperature:</b>	-20°C to 70°C
<b>Operating Temperature:</b>	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
<b>Humidity:</b>	5% to 95% relative humidity, non-condensing
<b>Altitude:</b>	Up to 1000m without derating, derate torque 10% per 1000m above 1000m

## GMB5600 SERIES SELECTION TABLE

$K_T$  = Torque Constant •  $K_V$  = BEMF =  $V_{RMS}$  Phase-to-Phase/1000 RPM •  $R_A$  = Phase-to-Phase Resistance •  $L_A$  = Phase-to-Phase Inductance

Model Number	Power @ Rated Speed		Speed, RPM		Cont. Stall Rating			Peak Stall Rating			$K_T$		$K_V$	$R_A$	$L_A$	Rotor Inertia	
	HP	KW	Max	Rated	Lb-in	Nm	Amps	Lb-in	Nm	Amps	Lb-in/A	Nm/A	V	$\Omega$	mH	Lb-in-sec <sup>2</sup>	Kg-m <sup>2</sup>
<b>GMB5627-70</b>	3.63	2.71	2700	2200	130	14.7	16	390	44.1	49	7.9	0.9	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	13.0	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	7.9	0.9	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	13.0	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	9.1	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	13.0	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	122.1	119	9.1	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	122.1	83	13.0	1.47	115	0.22	1.9	0.0370	0.00418

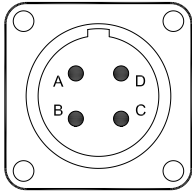
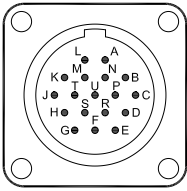
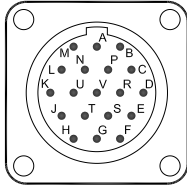
**NOTE:** All ratings based on a 25°C ambient temperature with the motor face mounted to a 14" x 14" x 3/4" aluminum heatsink. The values for Max and Rated Speed are for motors operated with a 230 VAC power supply. Current values are in peak phase current.

### BRAKE OPTION

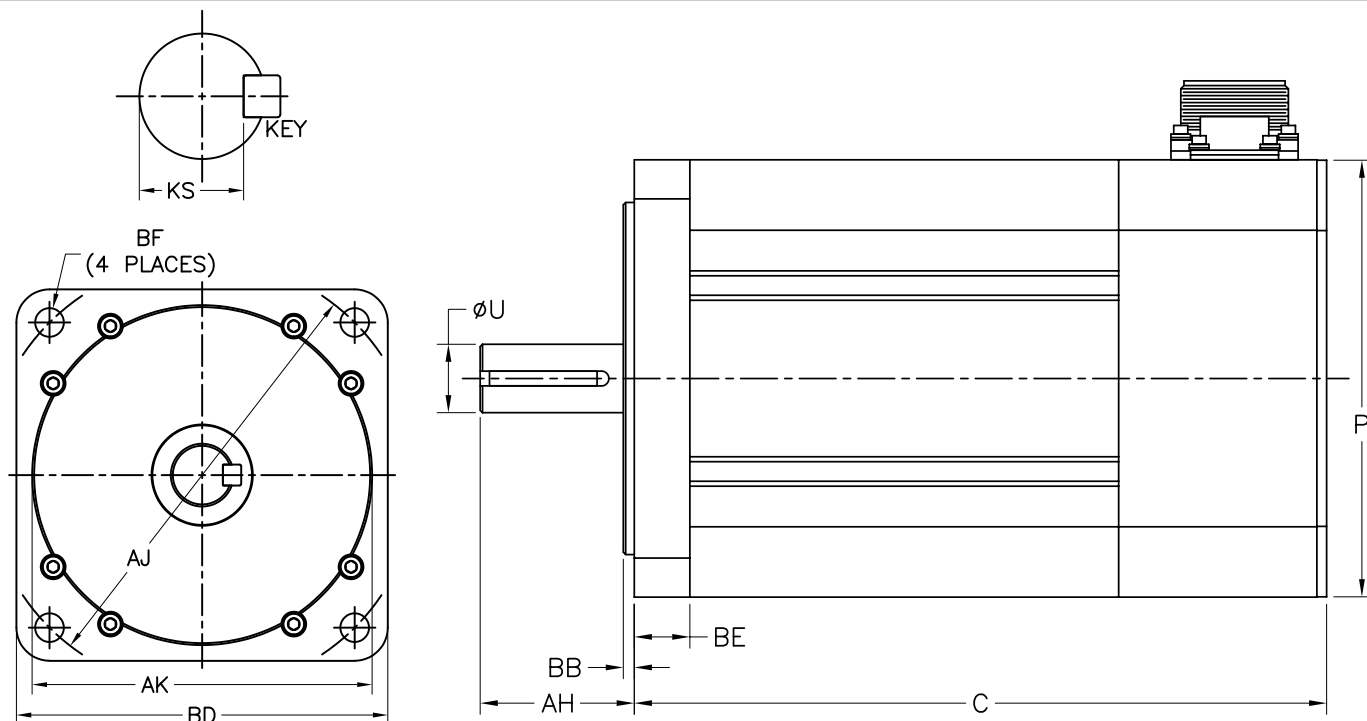
Brake requires 24V DC input voltage. The values for "Extension" represent the nominal maximum length that the brake will add to the motor. For some models, the extension will be less. Please contact one of our sales engineers for the exact values.

Extension	Torque		Power	Current	Resistance	Inductance
in. (mm)	Lb-in	Nm	Watts	A	$\Omega$	mH
2.25 (57)	318	36	26	1.1	22	1200

### CONNECTORS & PIN-OUT INFORMATION

4-Pin MS connector MS3102R22-22P		18-Pin MS connector MS3112E14-18P		19-Pin MS connector MS3112E14-19P						
 <b>FRONT VIEW</b> Straight Mating Connector, MS3106F22-22S		 <b>FRONT VIEW</b> Straight Mating Connector, MS3116F14-18S		 <b>FRONT VIEW</b> Straight Mating Connector, MS3116F14-19S						
Pin#	Function	Pin#	Function	Pin#	Function					
			Resolver		Resolver	Encoder with Commutation Track				
<b>A</b>	Phase R	<b>A</b>	Brake +	<b>A</b>	Temperature Switch	Temperature Switch				
<b>B</b>	Phase S	<b>B</b>	Brake -	<b>B</b>	Temperature Switch	Temperature Switch				
<b>C</b>	Phase T	<b>C</b>	Brake Shield	<b>C</b>	Resolver Shield	Encoder Shield				
<b>D</b>	Case Ground	<b>D</b>	Resolver Shield	<b>D</b>	N/C	Encoder +5VDC				
<b>Special mounting options are available. Please contact a Glentek Sales Engineer for detailed information.</b>				<b>E</b>	Reference	<b>E</b>	N/C	Encoder Common		
				<b>F</b>	Since Ground	<b>F</b>	Cosine Ground	<b>F</b>	Cosine Ground	Channel A+
				<b>G</b>	Cosine Ground	<b>G</b>	Sine	<b>G</b>	Cosine +	Channel A-
				<b>H</b>	Sine	<b>H</b>	N/C	<b>H</b>	Sine Ground	Channel B+
				<b>J</b>	N/C	<b>J</b>	N/C	<b>J</b>	Reference Ground	Channel B-
				<b>K</b>	N/C	<b>K</b>	N/C	<b>K</b>	Reference	Channel Z+
				<b>L</b>	N/C	<b>L</b>	N/C	<b>L</b>	N/C	Channel Z-
				<b>M</b>	N/C	<b>M</b>	Temperature Switch	<b>M</b>	N/C	Comm. Track S1+
				<b>N</b>	Temperature Switch	<b>N</b>	N/C	<b>N</b>	N/C	Comm. Track S1-
				<b>P</b>	N/C	<b>P</b>	Reference Ground	<b>P</b>	N/C	Comm. Track S2+
				<b>R</b>	Reference Ground	<b>R</b>	Cosine	<b>R</b>	N/C	Comm. Track S2-
				<b>S</b>	Cosine	<b>S</b>	N/C	<b>S</b>	N/C	Comm. Track S3+
				<b>T</b>	N/C	<b>T</b>	Temperature Switch	<b>T</b>	N/C	Comm. Track S3-
				<b>U</b>	Temperature Switch	<b>U</b>	Temperature Switch	<b>U</b>	Brake +	Brake +
		<b>V</b>	Temperature Switch	<b>V</b>	Brake -	Brake -				

## GMB5600 SERIES DIMENSIONS

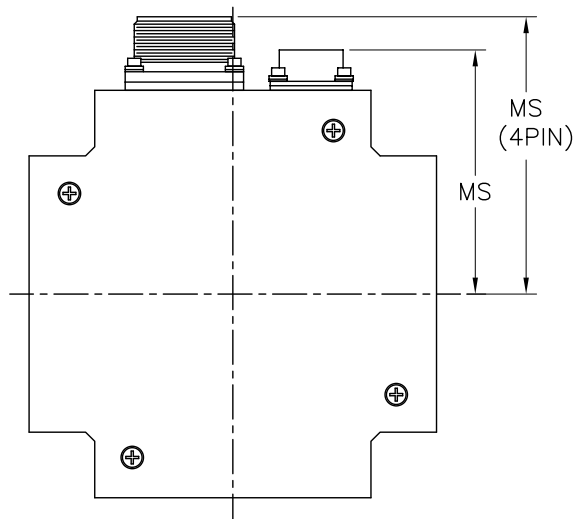


Model Number	Kg (lbs.)	C (max)	P (max)	Shaft				Flange/Face				Mounting Hole		
				AH	U	KEY	KS	AK	BB	BD	BE	AJ	BF Dia.	Tap
<b>GMB5627-XXX-M</b>	<b>15.0</b> (33.0)	<b>255.0</b> (10.0)	<b>142.0</b> (5.59)	<b>50.00</b> (1.97)	<b>24.00</b> (0.945)	<b>M8 X M7</b> <b>X 38</b>	<b>19.8 -</b> <b>20.0</b>	<b>130.00</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</b> <b>X 38</b>	<b>19.8 -</b> <b>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>M10 X M8</b> <b>X 36</b>	<b>26.8 -</b> <b>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>M10 X M8</b> <b>X 36</b>	<b>26.8 -</b> <b>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>

Note: Dimensions are in **mm** (inches)

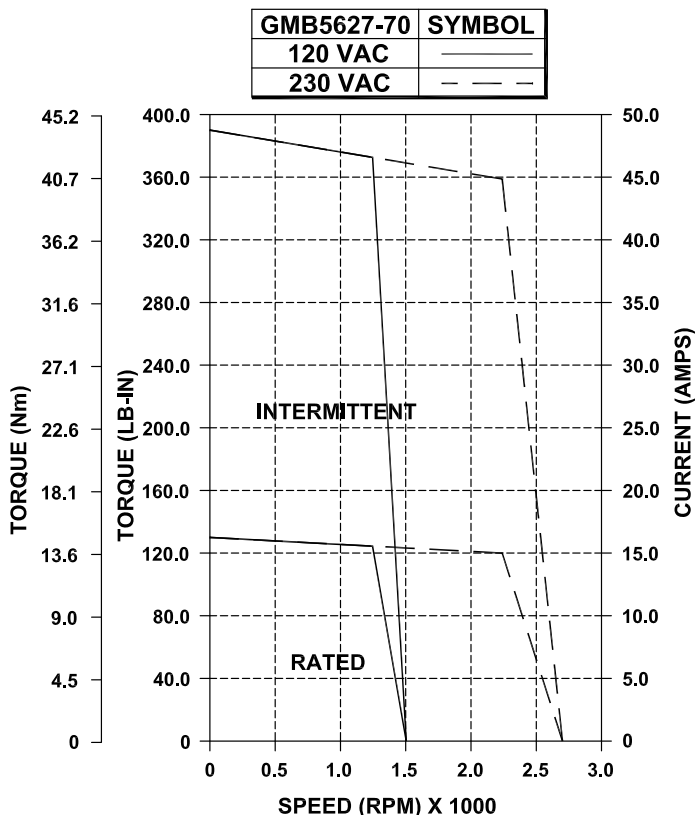
Model Number	Lbs. (Kg)	C (max)	P (max)	Shaft				Flange/Face				Mounting Hole		
				AH	U	KEY	KS	AK	BB	BD	BE	AJ	BF Dia.	Tap
<b>GMB5627-XXX-E</b>	<b>33.0</b> (15.0)	<b>10.06</b> (255.5)	<b>5.59</b> (142.0)	<b>1.97</b> (50.0)	<b>0.875</b> (22.23)	<b>.188 SQ</b> <b>X 1.50</b>	<b>.761 -</b> <b>0.771</b>	<b>4.500</b> (114.30)	<b>0.140</b> (3.56)	<b>5.59</b> (142.0)	<b>0.81</b> (20.57)	<b>5.875</b> (149.23)		<b>3/8-16</b> <b>THRU</b>
<b>GMB5654-XXX-E</b>	<b>50.0</b> (22.7)	<b>13.06</b> (331.7)	<b>5.59</b> (142.0)	<b>1.97</b> (50.0)	<b>0.875</b> (22.23)	<b>.188 SQ</b> <b>X 1.50</b>	<b>.761 -</b> <b>0.771</b>	<b>4.500</b> (114.30)	<b>0.140</b> (3.56)	<b>5.59</b> (142.0)	<b>0.81</b> (20.57)	<b>5.875</b> (149.23)		<b>3/8-16</b> <b>THRU</b>
<b>GMB5681-XXX-E</b>	<b>67.0</b> (30.4)	<b>16.06</b> (407.9)	<b>5.59</b> (142.0)	<b>1.97</b> (50.0)	<b>1.250</b> (31.75)	<b>.250 SQ</b> <b>X 1.50</b>	<b>1.102 -</b> <b>1.112</b>	<b>4.500</b> (114.30)	<b>0.140</b> (3.56)	<b>5.59</b> (142.0)	<b>0.81</b> (20.57)	<b>5.875</b> (149.23)		<b>3/8-16</b> <b>THRU</b>
<b>GMB56108-XXX-E</b>	<b>85.0</b> (38.6)	<b>19.06</b> (484.1)	<b>5.59</b> (142.0)	<b>1.97</b> (50.0)	<b>1.250</b> (31.75)	<b>.250 SQ</b> <b>X 1.50</b>	<b>1.102 -</b> <b>1.112</b>	<b>4.500</b> (114.30)	<b>0.140</b> (3.56)	<b>5.59</b> (142.0)	<b>0.81</b> (20.57)	<b>5.875</b> (149.23)		<b>3/8-16</b> <b>THRU</b>

Note: Dimensions are in **inches** (mm)



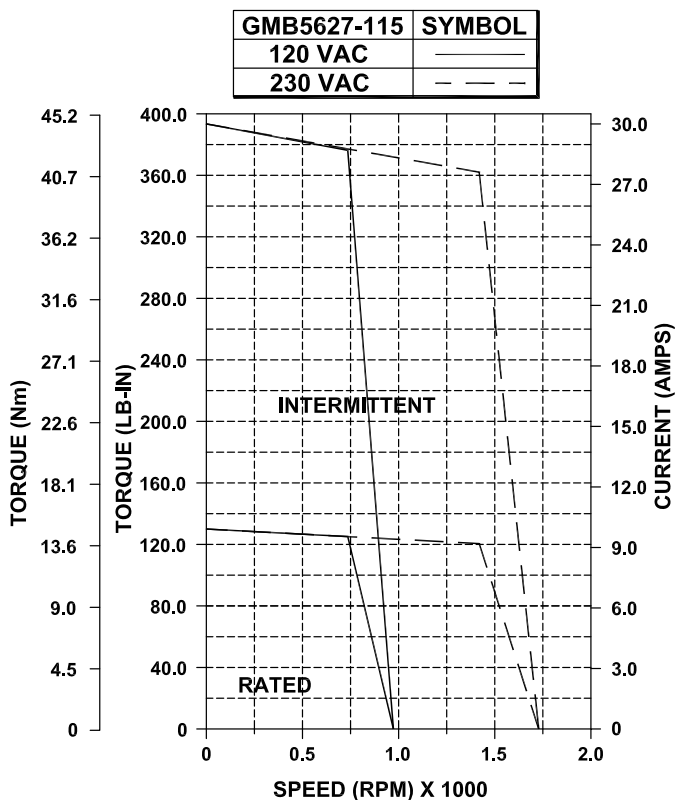
Connectors	MS inches (mm)	MS mm (inches)
<b>4-Pin</b>	<b>3.8</b> (96.5)	<b>96.5</b> (3.8)
<b>18-Pin</b>	<b>3.35</b> (85.0)	<b>85.0</b> (3.35)
<b>19-Pin</b>	<b>3.35</b> (85.0)	<b>85.0</b> (3.35)

## GMB5627-70 PERFORMANCE DATA



<b>Power @ Rated Speed</b>	<b>HP</b>	3.63
	<b>KW</b>	2.71
<b>Speed, RPM</b>	<b>Max.</b>	2700
	<b>Rated</b>	2200
<b>Cont. Stall Rating</b>	<b>Lb-in</b>	130
	<b>Nm</b>	14.7
	<b>Amps</b>	16
<b>Peak Stall Rating</b>	<b>Lb-in</b>	390
	<b>Nm</b>	44.1
	<b>Amps</b>	49
<b>Torque Constant</b>	<b>Lb-in/A</b>	7.9
	<b>Nm/A</b>	0.9
<b>Back EMF</b>	<b>V/Krpm</b>	70
<b>Resistance</b>	<b>Ohms</b>	0.54
<b>Inductance</b>	<b>mH</b>	3.5
<b>Armature Inertia</b>	<b>Lb-in-sec<sup>2</sup></b>	0.0111
	<b>Kg-m<sup>2</sup></b>	0.00125

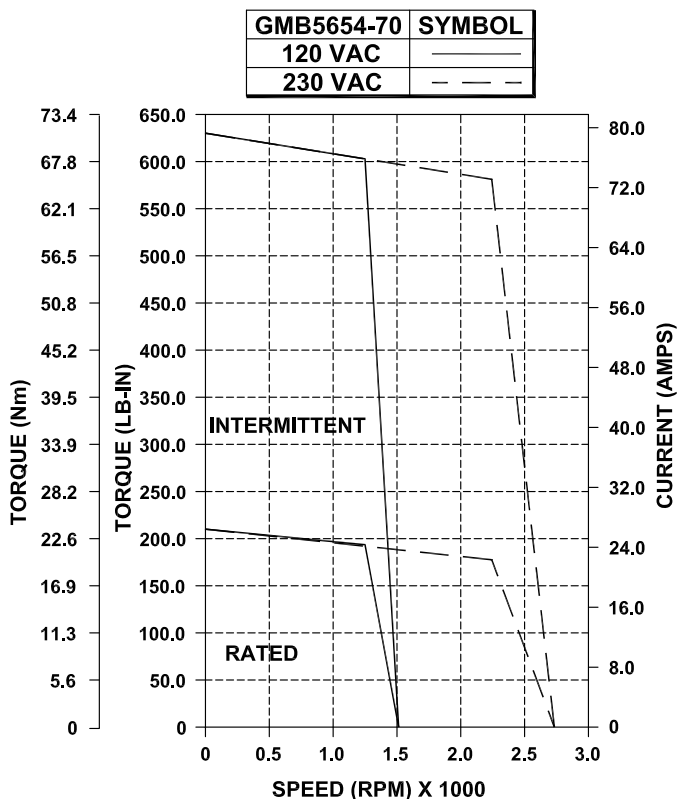
## GMB5627-115 PERFORMANCE DATA



<b>Power @ Rated Speed</b>	<b>HP</b>	2.31
	<b>KW</b>	1.72
<b>Speed, RPM</b>	<b>Max.</b>	1700
	<b>Rated</b>	1400
<b>Cont. Stall Rating</b>	<b>Lb-in</b>	130
	<b>Nm</b>	14.70
	<b>Amps</b>	10
<b>Peak Stall Rating</b>	<b>Lb-in</b>	390
	<b>Nm</b>	44.1
	<b>Amps</b>	30
<b>Torque Constant</b>	<b>Lb-in/A</b>	13.0
	<b>Nm/A</b>	1.47
<b>Back EMF</b>	<b>V/Krpm</b>	115
<b>Resistance</b>	<b>Ohms</b>	1.5
<b>Inductance</b>	<b>mH</b>	10.0
<b>Armature Inertia</b>	<b>Lb-in-sec<sup>2</sup></b>	0.0111
	<b>Kg-m<sup>2</sup></b>	0.00125

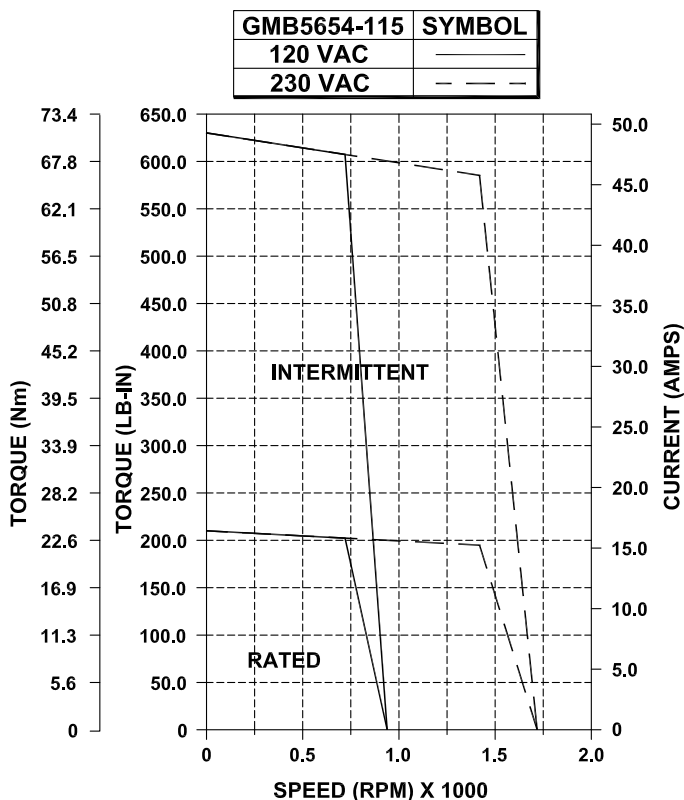
**NOTE:** All ratings based on a 25°C ambient temperature with the motor face mounted to a 14" x 14" x 3/4" aluminum heatsink.

## GMB5654-70 PERFORMANCE DATA



<b>Power @ Rated Speed</b>	HP	5.86
	KW	4.37
<b>Speed, RPM</b>	Max.	2700
	Rated	2200
<b>Cont. Stall Rating</b>	Lb-in	210
	Nm	23.70
	Amps	26
<b>Peak Stall Rating</b>	Lb-in	630
	Nm	71.1
	Amps	79
<b>Torque Constant</b>	Lb-in/A	7.9
	Nm/A	0.9
<b>Back EMF</b>	V/Krpm	70
<b>Resistance</b>	Ohms	0.20
<b>Inductance</b>	mH	1.6
<b>Armature Inertia</b>	Lb-in-sec <sup>2</sup>	0.0197
	Kg-m <sup>2</sup>	0.00223

## GMB5654-115 PERFORMANCE DATA

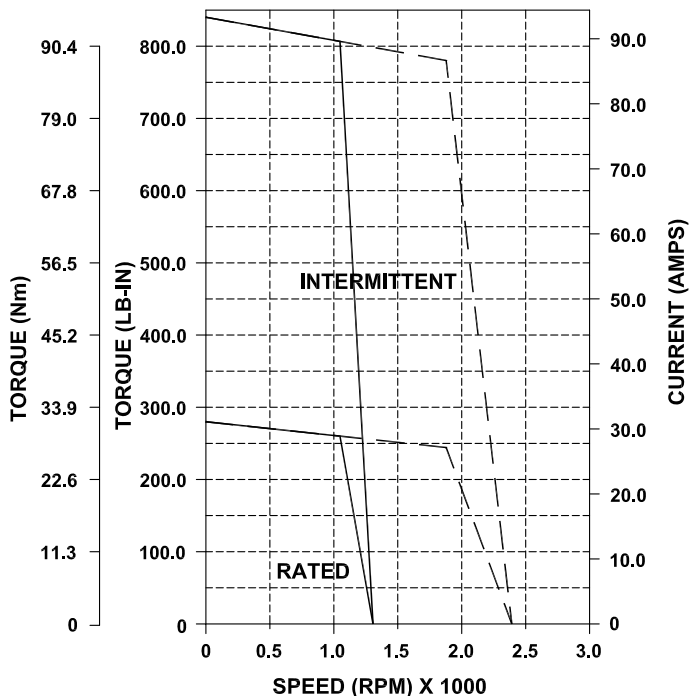


<b>Power @ Rated Speed</b>	HP	3.73
	KW	2.78
<b>Speed, RPM</b>	Max.	1700
	Rated	1400
<b>Cont. Stall Rating</b>	Lb-in	210
	Nm	23.7
	Amps	16
<b>Peak Stall Rating</b>	Lb-in	630
	Nm	71.1
	Amps	48
<b>Torque Constant</b>	Lb-in/A	13.0
	Nm/A	1.47
<b>Back EMF</b>	V/Krpm	115
<b>Resistance</b>	Ohms	0.50
<b>Inductance</b>	mH	4.1
<b>Armature Inertia</b>	Lb-in-sec <sup>2</sup>	0.0197
	Kg-m <sup>2</sup>	0.00223

**NOTE:** All ratings based on a 25°C ambient temperature with the motor face mounted to a 14" x 14" x 3/4" aluminum heatsink.

## GMB5681-80 PERFORMANCE DATA

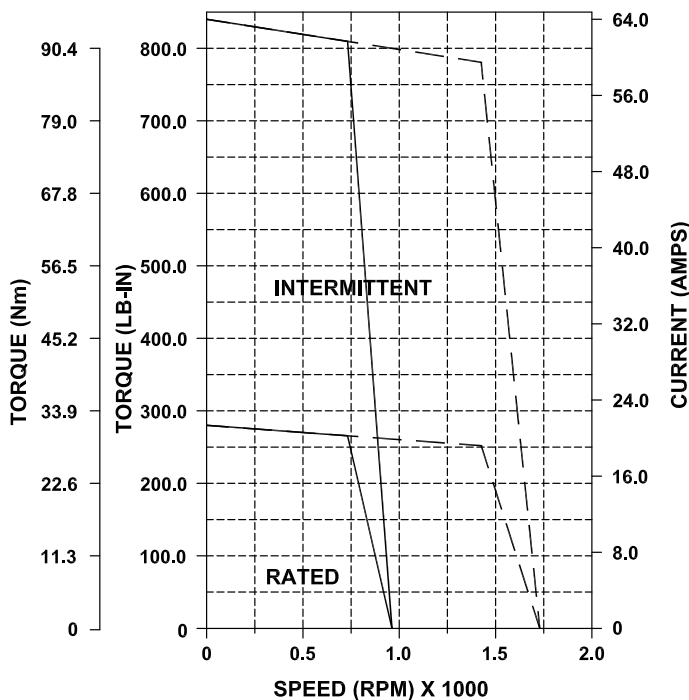
GMB5681-80	SYMBOL
120 VAC	— — — —
230 VAC	- - - -



<b>Power @ Rated Speed</b>	HP	6.75
	KW	5.04
<b>Speed, RPM</b>	Max.	2400
	Rated	1900
<b>Cont. Stall Rating</b>	Lb-in	280
	Nm	31.6
	Amps	31
<b>Peak Stall Rating</b>	Lb-in	840
	Nm	94.8
	Amps	93
<b>Torque Constant</b>	Lb-in/A	9.0
	Nm/A	1.02
<b>Back EMF</b>	V/Krpm	80
<b>Resistance</b>	Ohms	0.17
<b>Inductance</b>	mH	1.5
<b>Armature Inertia</b>	Lb-in-sec <sup>2</sup>	0.0287
	Kg-m <sup>2</sup>	0.00324

## GMB5681-115 PERFORMANCE DATA

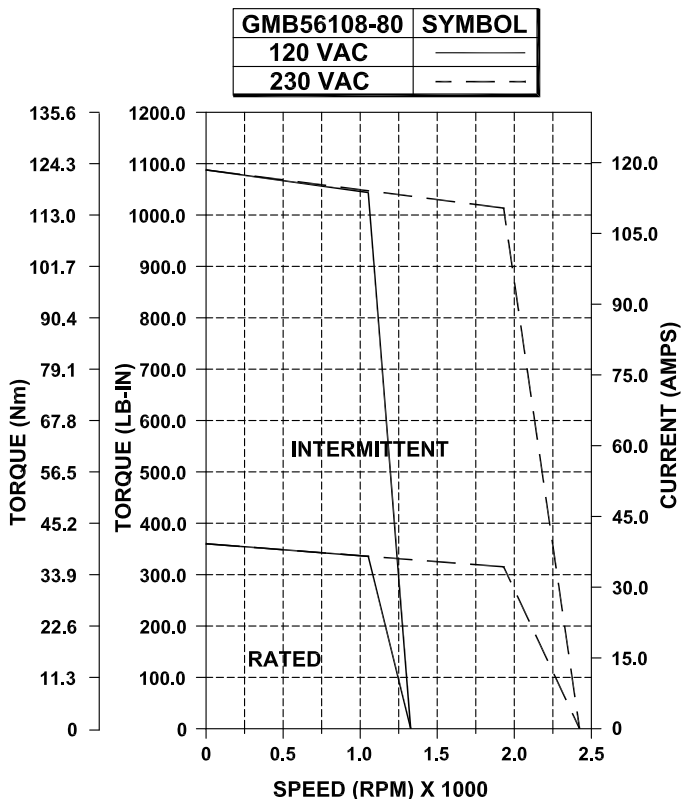
GMB5681-115	SYMBOL
120 VAC	— — — —
230 VAC	- - - -



<b>Power @ Rated Speed</b>	HP	4.98
	KW	3.71
<b>Speed, RPM</b>	Max.	1700
	Rated	1400
<b>Cont. Stall Rating</b>	Lb-in	280
	Nm	31.6
	Amps	21
<b>Peak Stall Rating</b>	Lb-in	840
	Nm	94.8
	Amps	64
<b>Torque Constant</b>	Lb-in/A	13.0
	Nm/A	1.47
<b>Back EMF</b>	V/Krpm	115
<b>Resistance</b>	Ohms	0.34
<b>Inductance</b>	mH	2.9
<b>Armature Inertia</b>	Lb-in-sec <sup>2</sup>	0.0287
	Kg-m <sup>2</sup>	0.00324

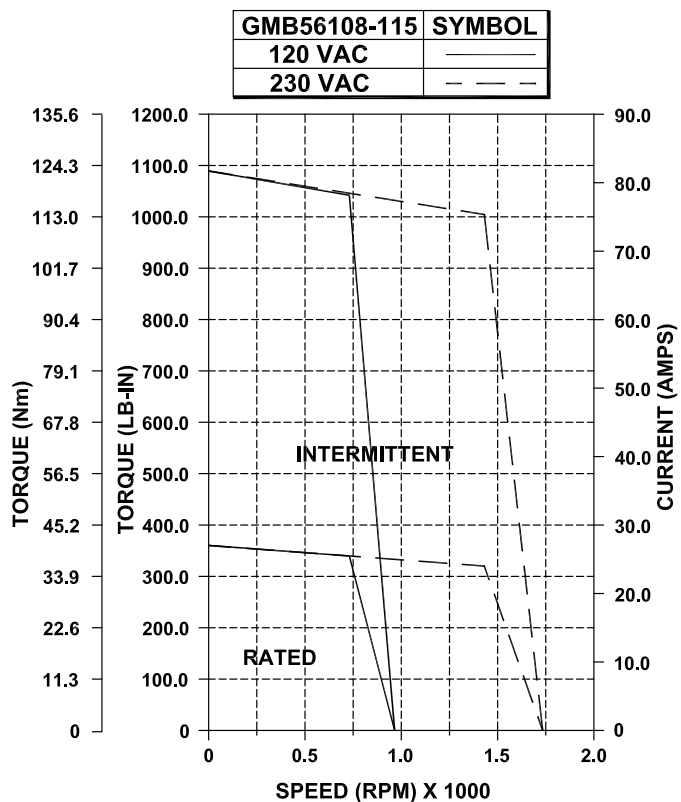
**NOTE:** All ratings based on a 25°C ambient temperature with the motor face mounted to a 14" x 14" x 3/4" aluminum heatsink.

## GMB56108-80 PERFORMANCE DATA



<b>Power @ Rated Speed</b>	<b>HP</b>	8.68
	<b>KW</b>	6.47
<b>Speed, RPM</b>	<b>Max.</b>	2400
	<b>Rated</b>	1900
<b>Cont. Stall Rating</b>	<b>Lb-in</b>	360
	<b>Nm</b>	40.7
	<b>Amps</b>	40
<b>Peak Stall Rating</b>	<b>Lb-in</b>	1080
	<b>Nm</b>	122.1
	<b>Amps</b>	120
<b>Torque Constant</b>	<b>Lb-in/A</b>	9.1
	<b>Nm/A</b>	1.02
<b>Back EMF</b>	<b>V/Krpm</b>	80
<b>Resistance</b>	<b>Ohms</b>	0.12
<b>Inductance</b>	<b>mH</b>	1.1
<b>Armature Inertia</b>	<b>Lb-in-sec<sup>2</sup></b>	0.0370
	<b>Kg-m<sup>2</sup></b>	0.00418

## GMB56108-115 PERFORMANCE DATA



<b>Power @ Rated Speed</b>	<b>HP</b>	6.40
	<b>KW</b>	4.77
<b>Speed, RPM</b>	<b>Max.</b>	1700
	<b>Rated</b>	1400
<b>Cont. Stall Rating</b>	<b>Lb-in</b>	360
	<b>Nm</b>	40.7
	<b>Amps</b>	28
<b>Peak Stall Rating</b>	<b>Lb-in</b>	1080
	<b>Nm</b>	122.1
	<b>Amps</b>	83
<b>Torque Constant</b>	<b>Lb-in/A</b>	13.0
	<b>Nm/A</b>	1.47
<b>Back EMF</b>	<b>V/Krpm</b>	115
<b>Resistance</b>	<b>Ohms</b>	0.22
<b>Inductance</b>	<b>mH</b>	1.9
<b>Armature Inertia</b>	<b>Lb-in-sec<sup>2</sup></b>	0.0370
	<b>Kg-m<sup>2</sup></b>	0.00418

**NOTE:** All ratings based on a 25°C ambient temperature with the motor face mounted to a 14" x 14" x 3/4" aluminum heatsink.



## GMB5600 SERIES MODEL NUMBERING

This section explains the model numbering system for Glentek's GMB5600 Series Brushless Servo Motors. 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 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.

GMB 56 27 - 70 - E - 0 0 2 0 0 1 0 0 -  

- Magnet Type** blank = NdFeB
- Frame Size** 56 = 5.6" (4 pole) Motor
- Stack Length** 27 = 2.7 inch stack
- Back EMF Constant** 70 = 70 V/Krpm
- Dimensions** E = English
- Brake option** 0 = No brake installed
- Commutation Device** 0 = Brushless Resolver
- Number of Motor poles** 2 = 6 Pole
- Flange Type** 0 = Standard
- Shaft Type** 0 = Standard
- Lead Termination** 1 = Two MS Connectors
- Wiring Diagram (MS connector lead termination only)** 0 = Glentek Standard
- Encoder Option** 0 = No encoder installed
- Factory Assigned Option** leave blank

GMB       -   -   -                     -  

Magnet Type			
Leave blank for rare earth magnets			
Frame Size			
56	5.6" Motor		
Stack Length			
27	2.7" Stack	81	8.1" Stack
54	5.4" Stack	108	10.8" Stack

Back EMF Constant							
2.7" Stack		5.4" Stack		8.1" Stack		10.8" Stack	
70	34V/Krpm	70	70V/Krpm	80	80V/Krpm	80	80V/Krpm
115	115V/Krpm	115	115V/Krpm	115	115V/Krpm	115	115V/Krpm
For custom Back EMF, Please Contact Glentek							

Dimensions				
E	English		M	Metric

Brake Option						
0	No brake installed		1	24 VDC Brake	2	Special

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

Number of Motor Poles	
2	6 pole

Flange Type	
0	Standard
1	Special

Shaft Type	
0	Standard
1	Special

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

Wiring Diagram (MS connector lead termination only)				
0	Glentek Standard		1	Special

Encoder Option								
0	No encoder installed		4	1250 PPR	8	8192 PPR	C	4096 PPR
1	500PPR		5	2000 PPR	9	5000 PPR	D	3600 PPR
2	1000PPR		6	2500 PPR	A	512 PPR	E	18000 PPR
3	1024PPR		7	Special	B	2048 PPR		

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