

GLENTEK DC BRUSH SERVO MOTORS GM6000 SERIES

Revision: 3/24/2017



Glentek's GM6000 series of high performance, permanent magnet DC brush servo motors 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. These motors incorporate skewed armatures, which provide ultra smooth operation (i.e. low cogging torque) at all speeds.

- Continuous Torque Range:
75.0 Lb-in (8.47 Nm) to 113 Lb-in (12.77 Nm)
- Peak Torque Range:
375.0 Lb-in (42.35 Nm) to 565.0 Lb-in (63.85 Nm)

GM6000 SERIES FEATURES

Skewed armature design provides ultra smooth operation (i.e. low cogging torque) at all speeds.
Various electrical windings are available as standard to suit both low and high voltage amplifiers 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 (Square, Round, and NEMA 56C). 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, and encoders)
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.
Optional IP65 sealing is available
RoHS compliant.
CE marked.
UL Recognized Component for US and Canada.

GM6000 SERIES 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

GM6000 SERIES SELECTION TABLE

$K_T = \text{Torque Constant} \cdot K_V = \text{BEMF} = \text{Volts}/1000 \text{ RPM} \cdot L_A = \text{Inductance}$

Model Number	Power @ Max Speed		Cont. Stall Rating			Peak Stall Rating			K_T		R_A	L_A	RPM	K_V	Armature Inertia	
	HP	KW	Lb-in	Nm	Amps	Lb-in	Nm	Amps	Lb-in/A	Nm/A	Ω	mH	Max	V/Krpm	Lb-in-sec ²	Kg-m ²
GM6060-39	3.57	2.663	75	8.47	22.8	375.0	42.35	114.0	3.29	0.37	0.3	0.95	3000	39	0.05300	0.005989
GM6060-50	2.98	2.223	75	8.47	17.8	375.0	42.35	89.0	4.22	0.48	0.8	1.00	2500	50	0.05300	0.005989
GM6060-70	2.14	1.596	75	8.47	12.5	375.0	42.35	62.4	5.91	0.67	1.2	0.95	1800	70	0.05300	0.005989
GM6060-96	1.79	1.335	75	8.47	9.3	375.0	42.35	46.5	8.11	0.92	1.4	0.95	1500	96	0.05300	0.005989
GM6090-50	4.46	3.27	113	12.77	26.7	565.0	63.85	133.5	4.22	0.48	0.4	1.00	2500	50	0.08000	0.009040

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

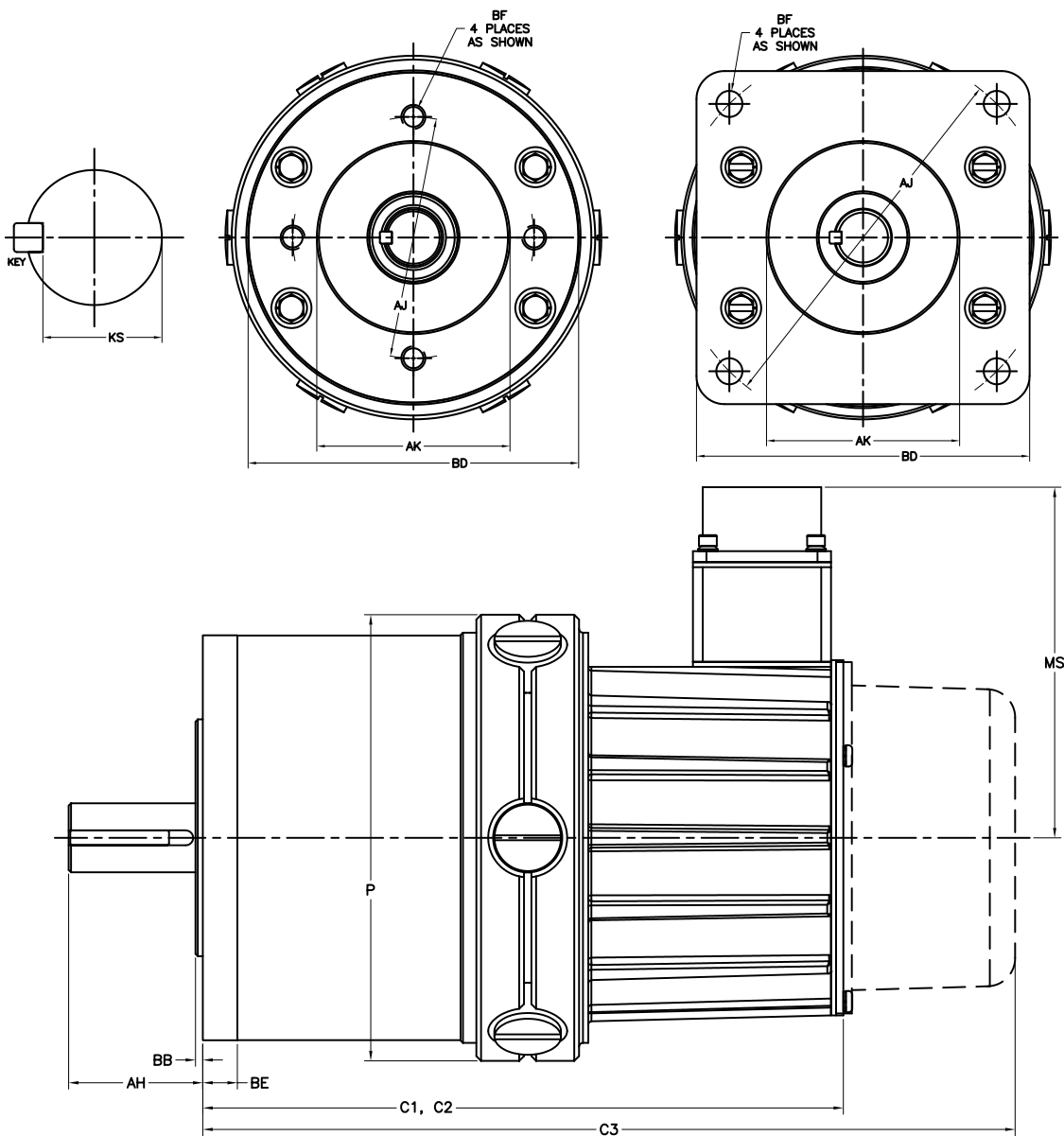
BRAKE OPTION

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
in. (mm)	Lb-in	Nm	Watts
2.63 (67)	159	18	24

GM6000 SERIES DIMENSIONS

C1 = Bare Motor, C2 = Motor with Tachometer or Encoder, C3 = Motor with Tachometer and Encoder.
 Note: Dimensions are in inches (mm)



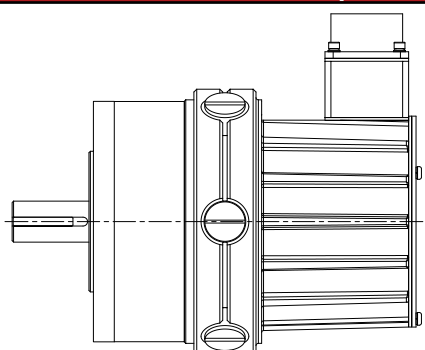
Model Number	Lbs (kg)	C1		C2		C3		P
		RND	SQR	RND	SQR	RND	SQR	
GM6060	41.0 (18.6)	13.92 (353.57)	13.92 (353.57)	17.10 (434.34)	17.10 (434.34)	17.10 (434.34)	17.10 (434.34)	5.65 (143.51)
GM6090	56.0 (25.5)	16.92 (429.77)	16.92 (429.77)	20.10 (510.54)	20.10 (510.54)	20.10 (510.54)	20.10 (510.54)	5.65 (143.51)

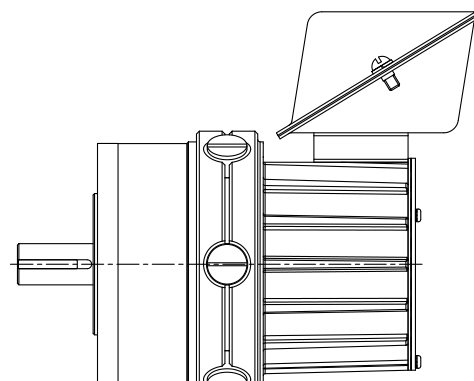
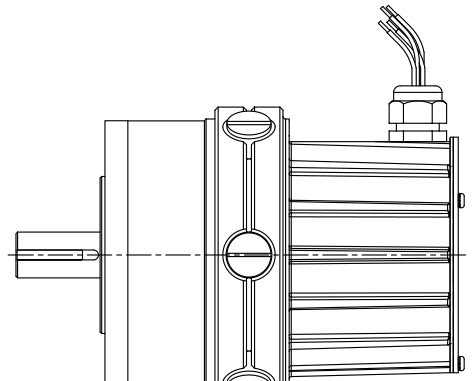
Connectors	Liquid Tight	Terminal Box	16-Pin
MS	3.32 (84.3)	5.58 (141.7)	4.08 (103.6)

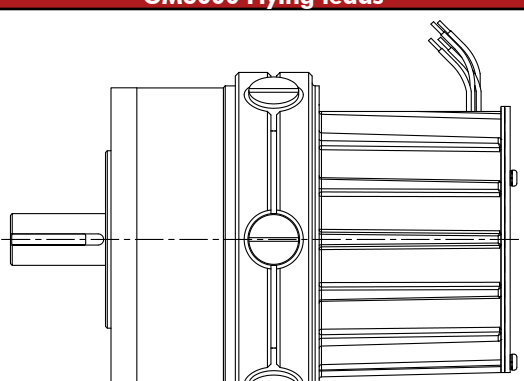
Flange Type	Shaft				Flange/Face				Mounting Hole		
	AH	U (MAX)	KEY	KS	AJ	AK	BB	BD	BE (MAX)	BF Dia.	Tap
Round	1.70 (43.18)	0.8750 (22.23)	0.188 SQ. X 1.50	0.761- 0.771	3.750 (95.25)	3.000 (76.20)	0.09 (2.29)	5.12 (130.05)	0.44 (11.18)	-	3/8-16 ▽.50
Square	1.70 (43.18)	0.8750 (22.23)	0.188 SQ. X 1.50	0.761- 0.771	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 ▽.50
NEMA 56C	2.06 (52.32)	0.6250 (15.88)	0.188 SQ. X 1.50	0.507- 0.517	5.875 (149.23)	4.500 (114.30)	0.09 (2.29)	6.50 (165.10)	0.44 (11.18)	-	3/8-16 THRU

CONNECTORS & PIN-OUT INFORMATION

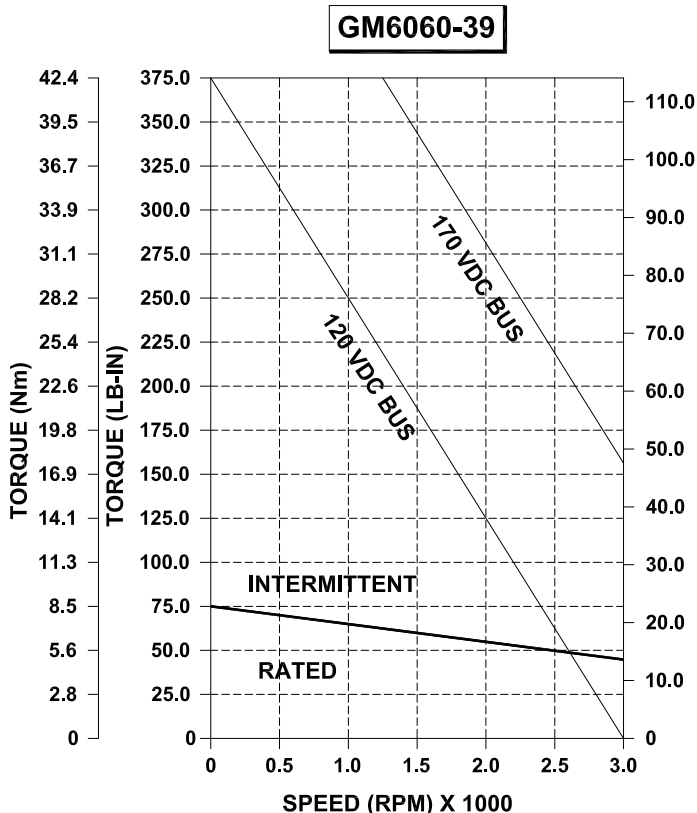
With a positive voltage applied to the red motor lead (Motor +) with respect to the black motor lead (Motor -), the motor drive shaft will turn in the **counter-clockwise** direction as viewed from the shaft end.

GM 4000 Series Standard 16-pin MS Connector Location	MS3102R-24-07P	Encoder Feedback	Resolver Feedback
 <p style="font-size: small; margin-top: 10px;"> •Straight Mating Connector: MS3106F-20-27S •90° Mating Connector: MS3108E-20-27S </p>	16-Pin	Function	Function
	A	Channel A+	Sine Sig (S1)
	B	Channel A-	Sine Com (S2)
	C	Channel B+	Cosine Sig (S3)
	D	Channel B-	Cosine Com (S4)
	E	Channel Z+	Reference Sig (R1)
	F	Channel Z-	Reference Com (R2)
	G	+5 VDC	N/C
	H	Common	N/C
	I	Cable Shield	N/C
	J	Tachometer +	
	K	Tachometer -	
	L	Tachometer Cable Shield	
	M	Brake +	
	N	Motor +	
	O	Brake -	
P	Motor -		

GM6000 Terminal Box	GM6000 NPT
	

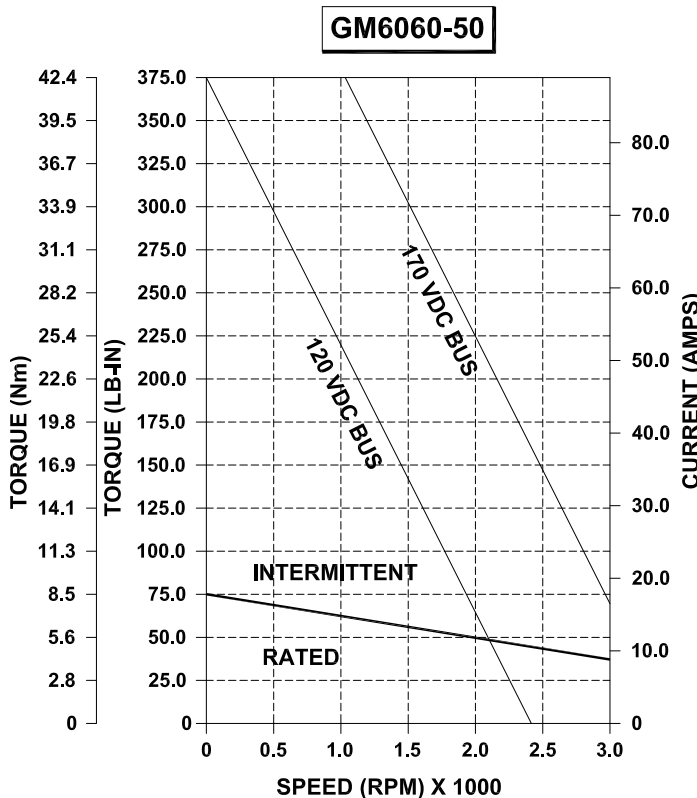
GM6000 Flying leads	
	<p>Glentek's GM6000 Series offer Special mounting options please contact a Gletnek Sales Engineer for detailed information.</p>

GM6060-39 PERFORMANCE DATA



Power @ Max Speed	HP	3.57
	KW	2.663
Cont. Stall Rating	Lb-in	75
	Nm	8.47
	Amps	22.8
Peak Stall Rating	Lb-in	375.0
	Nm	42.35
	Amps	114.0
Torque Constant	Lb-in/A	3.29
	Nm/A	0.37
Resistance	Ohms	0.3
Inductance	mH	0.95
Maximum Speed	RPM	3000
Back EMF	V/Krpm	39
Armature Inertia	Lb-in-sec²	0.05300
	Kg-m²	0.005989

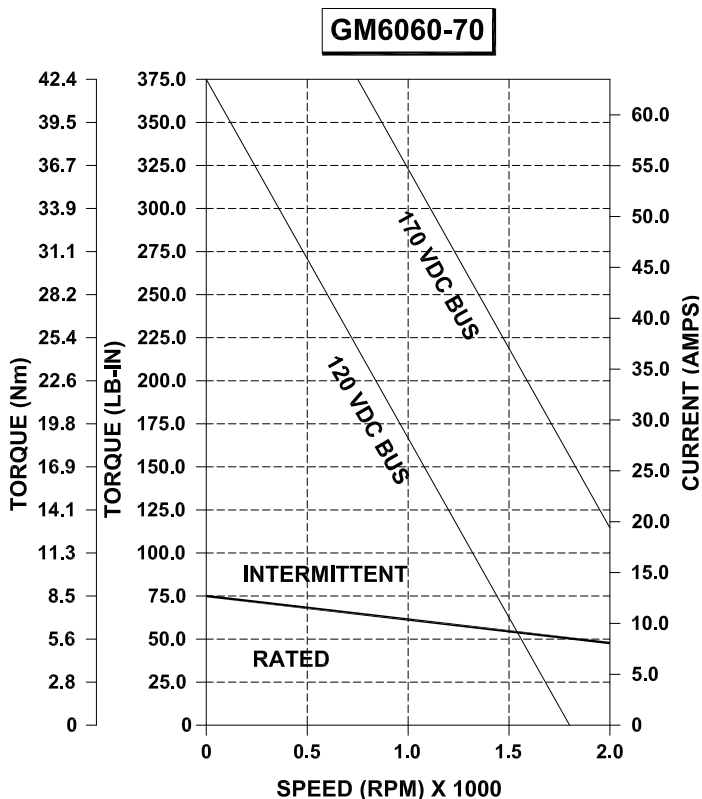
GM6060-50 PERFORMANCE DATA



Power @ Max Speed	HP	2.98
	KW	2.223
Cont. Stall Rating	Lb-in	75
	Nm	8.47
	Amps	17.8
Peak Stall Rating	Lb-in	375.0
	Nm	42.35
	Amps	89.0
Torque Constant	Lb-in/A	4.22
	Nm/A	0.48
Resistance	Ohms	0.8
Inductance	mH	1.00
Maximum Speed	RPM	2500
Back EMF	V/Krpm	50
Armature Inertia	Lb-in-sec²	0.05300
	Kg-m²	0.005989

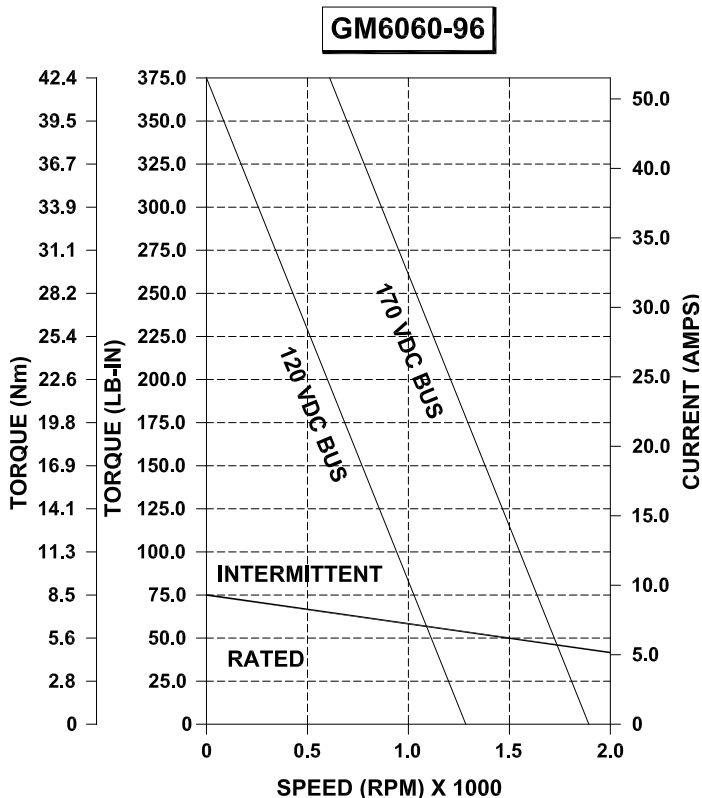
NOTE: All ratings based on a 40°C ambient temperature with the motor face mounted to a 12" x 12" x 1/2" aluminum heatsink.

GM6060-70 PERFORMANCE DATA



Power @ Max Speed	HP	2.14
	KW	1.596
Cont. Stall Rating	Lb-in	75
	Nm	8.47
	Amps	12.5
Peak Stall Rating	Lb-in	375.0
	Nm	42.35
	Amps	62.4
Torque Constant	Lb-in/A	5.91
	Nm/A	0.67
Resistance	Ohms	1.2
Inductance	mH	0.95
Maximum Speed	RPM	1800
Back EMF	V/Krpm	70
Armature Inertia	Lb-in-sec²	0.05300
	Kg-m²	0.005989

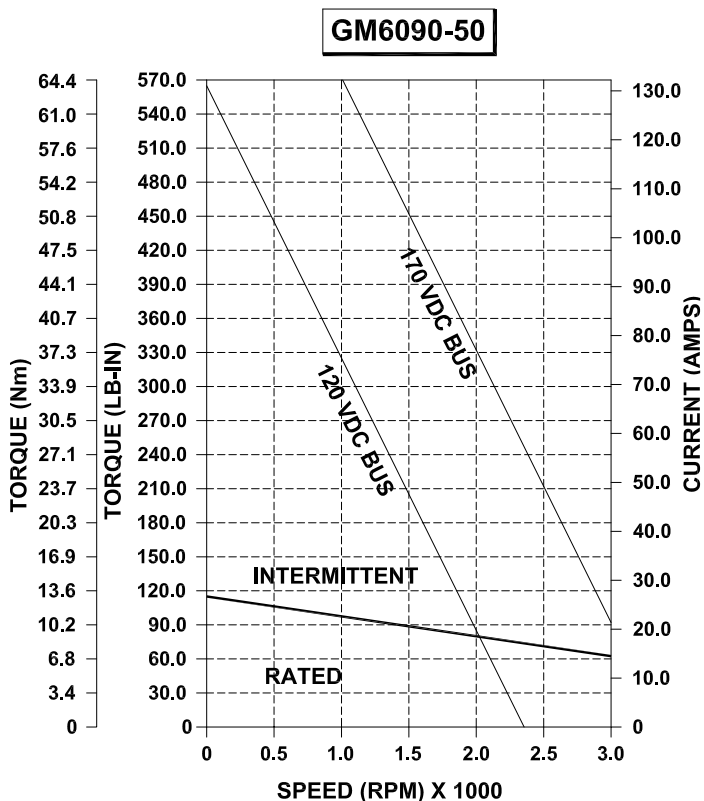
GM6060-96 PERFORMANCE DATA



Power @ Max Speed	HP	1.79
	KW	1.335
Cont. Stall Rating	Lb-in	75
	Nm	8.47
	Amps	9.3
Peak Stall Rating	Lb-in	375.0
	Nm	42.35
	Amps	46.5
Torque Constant	Lb-in/A	8.11
	Nm/A	0.92
Resistance	Ohms	1.4
Inductance	mH	0.95
Maximum Speed	RPM	1500
Back EMF	V/Krpm	96
Armature Inertia	Lb-in-sec²	0.05300
	Kg-m²	0.005989

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

GM6090-50 PERFORMANCE DATA



Power @ Max Speed	HP	4.46
	KW	3.327
Cont. Stall Rating	Lb-in	113
	Nm	12.77
	Amps	26.7
Peak Stall Rating	Lb-in	565.0
	Nm	63.85
	Amps	133.5
Torque Constant	Lb-in/A	4.22
	Nm/A	0.48
Resistance	Ohms	0.4
Inductance	mH	1.00
Maximum Speed	RPM	2500
Back EMF	V/Krpm	50
Armature Inertia	Lb-in-sec²	0.08000
	Kg-m²	0.009040

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

GM6000 SERIES MODEL NUMBERING

This section explains the model numbering system for Glentek's GM6000 Series DC Brush 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.

GM
60
60
-
39
-
0
2
8
0
0
5
0
0
-

- Frame Size** 60 = 6.0" Motor ↑
- Stack Length** 60 = 6.0 inch stack ↑
- Back EMF Constant** 39 = 39 V/Krpm ↑
- Brake Option** 0 = No brake installed ↑
- Tachometer Option** 2 = 7 VDC tachometer ↑
- Encoder Option** 8 = 2500 PPR ↑
- Brushless Resolver Option** 0 = No resolver installed ↑
- Flange Type** 0 = Standard Round ↑
- Lead Termination** 5 = Male MS connector, MS3102R-24-07P (16-pin style) ↑
- Wiring Diagram** 0 = Glentek Standard ↑
- Sealing Option** 0 = No shaft seal ↑
- Factory Assigned Option** Leave blank ↑

GM

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Frame Size	
60	6.0" Motor

Stack Length	
60	6.0" Stack
90	9.0" Stack

Back EMF Constant			
6.0" only		9.0" only	
39	39V/Krpm	70	70V/Krpm
50	50V/Krpm	96	96V/Krpm

For custom Back EMF, Please Contact Glentek

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

Tachometer Option			
0	No tachometer installed	2	7 VDC tachometer
1	3 VDC tachometer	3	9.5 VDC tachometer
4	Special	-	-

Encoder Option			
0	No encoder installed	4	1000 PPR
2	500 PPR	6	2000 PPR
8	2500 PPR	9	Special

Brushless Resolver Option			
0	No resolver installed	1	Brushless resolver
2	Special		

Flange Type			
0	Standard Round	5	NEMA 56C
1	Standard Square	6	Special

Lead Termination			
0	Flying leads exiting through a rubber grommet	6	Liquid tight strain relief with flying leads
1	.5" NPT with flying leads	7	Terminal Box
2	.75" NPT with flying leads	8	Special
5	16-Pin, Male MS connecto		

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

Sealing Option			
0	No shaft seal	1	Shaft Seal
2	Special		

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