



## GM9413-2

Lo-Cog® DC Gearmotor

Assembly Data	Symbol	Units	Value	
Reference Voltage	E	V	12	
No-Load Speed	S <sub>NL</sub>	rpm (rad/s)	142	(14.9)
Continuous Torque (Max.) <sup>1</sup>	T <sub>C</sub>	oz-in (N-m)	45	(3.2E-01)
Peak Torque (Stall) <sup>2</sup>	T <sub>PK</sub>	oz-in (N-m)	109	(7.7E-01)
Weight	W <sub>M</sub>	oz (g)	15.2	(432)
Motor Data				
Torque Constant	K <sub>T</sub>	oz-in/A (N-m/A)	5.60	(3.95E-02)
Back-EMF Constant	K <sub>E</sub>	V/krpm (V/rad/s)	4.14	(3.95E-02)
Resistance	R <sub>T</sub>	Ω	8.33	
Inductance	L	mH	6.17	
No-Load Current	I <sub>NL</sub>	A	0.10	
Peak Current (Stall) <sup>2</sup>	I <sub>P</sub>	A	1.44	
Motor Constant	K <sub>M</sub>	oz-in/√W (N-m/√W)	1.94	(1.37E-02)
Friction Torque	T <sub>F</sub>	oz-in (N-m)	0.50	(3.5E-03)
Rotor Inertia	J <sub>M</sub>	oz-in-s <sup>2</sup> (kg-m <sup>2</sup> )	3.9E-04	(2.8E-06)
Electrical Time Constant	τ <sub>E</sub>	ms	0.74	
Mechanical Time Constant	τ <sub>M</sub>	ms	14.7	
Viscous Damping	D	oz-in/krpm (N-m-s)	0.011	(7.6E-07)
Damping Constant	K <sub>D</sub>	oz-in/krpm (N-m-s)	2.8	(1.9E-04)
Maximum Winding Temperature	θ <sub>MAX</sub>	°F (°C)	311	(155)
Thermal Impedance	R <sub>TH</sub>	°F/watt (°C/watt)	66.4	(19.1)
Thermal Time Constant	τ <sub>TH</sub>	min	11.1	
Gearbox Data				
Reduction Ratio			19.7	
Efficiency			0.73	
Maximum Allowable Torque		oz-in (N-m)	175	(1.24)
Encoder Data				

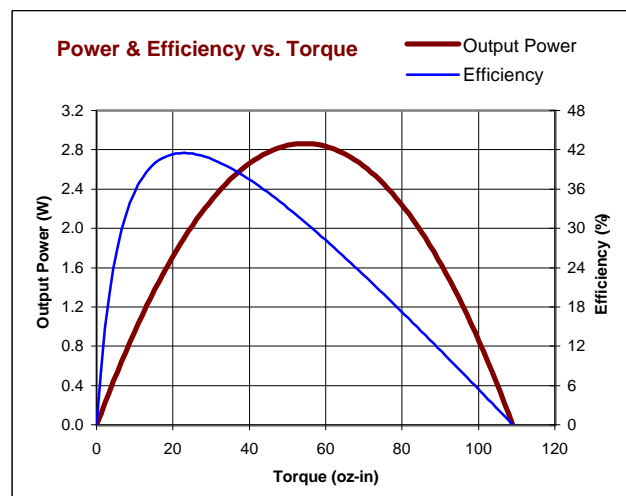
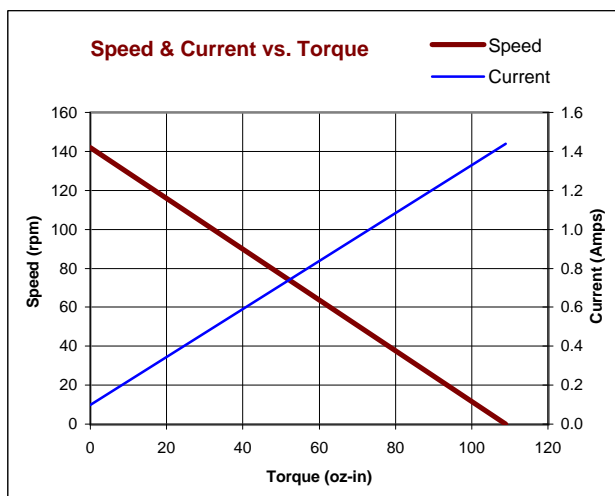
### Included Features

- 2-Pole Stator
- Ceramic Magnets
- Heavy-Gauge Steel Housing
- 7-Slot Armature
- Silicon Steel Laminations
- Stainless Steel Shaft
- Copper-Graphite Brushes
- Diamond Turned Commutator
- Motor Sleeve Bearings
- Output Sleeve Bearing
- Standard Gears

### Customization Options

- Alternate Winding
- Sleeve or Ball Bearings
- Modified Output Shaft
- Custom Cable Assembly
- Special Brushes
- EMI/RFI Suppression
- Alternate Gear Material
- Special Lubricant
- Optional Encoder
- Fail-Safe Brake

1 - Specified at max. winding temperature at 25°C ambient without heat sink. 2 - Theoretical values supplied for reference only.

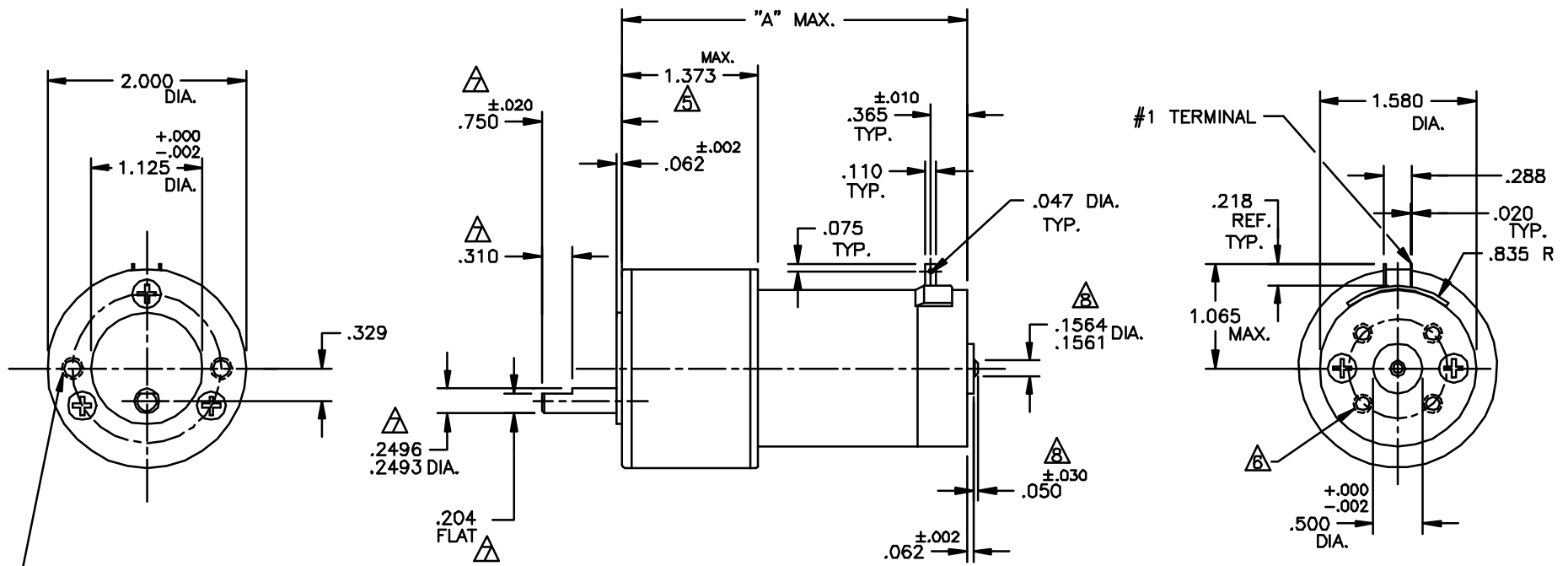


All values are nominal. Specifications subject to change without notice. Graphs are shown for reference only.

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REVISIONS				
LTR	DESCRIPTION	DRFT/ENGR	DATE	APPR
F	ADDED NOTES 7&8. REVISED DRAWING	RJS/RJS	3/15/96	



#10-32 UNF-2B, .250 DP. REF.  
2 HOLES 180° APART  
ON A 1.500 DIA. B.C.

- NOTES:
1. SHAFT ROTATION IS SHOWN WHILE VIEWING OUTPUT SHAFT WITH POSITIVE VOLTAGE (+) APPLIED TO #1 TERMINAL.
  2. TERMINALS ARE TIN PLATED FOR SOLDERING.
  3. ENDPLAY .015 MAX. ON MOTOR SHAFT, .020 MAX. ON OUTPUT SHAFT.
  4. LIMIT TORQUE ON GEARBOX TO 175 oz.in., STANDARD (STD.)GEARING  
LIMIT TORQUE ON GEARBOX TO 300 oz.in., HIGH TORQUE (H-T) GEARING  
LIMIT TORQUE ON GEARBOX TO 500 oz.in., WIDE FACE (WF) GEARING
- △ FOR WIDE FACE RATIOS 728/1419:1 SEE 150-33-2  
 △ FOR 2426.9/4732.5:1 RATIOS (ALL GEAR TYPES) SEE 150-33-2.  
 △ OPTIONAL REAR MOUNTING PATTERN AVAILABLE, #6-32 UNC-2B .250 DP. MAX., 4 HOLES ON A 1.000 DIA. B.C..  
 △ ALL SHAFT DIMENSIONS NOTED ARE STANDARD (10-535); FOR ALL OTHER SHAFT CONFIGURATIONS REFER TO DATA SHEET FOR PART NUMBERS.  
 △ OPTIONAL REAR SHAFT EXTENSIONS AVAILABLE FOR MOTOR SHAFT CONFIG. SEE DATA SHEET.

△	728/1419:1	CW
ALL TYPES	218.4/426:1	CCW
ALL TYPES	65.5/127.7:1	CW
ALL TYPES	19.7/38.3:1	CCW
ALL TYPES	5.9/11.5:1	CW
GEARING	GEAR RATIO	DIRECTION

GM94X6	4.326
GM94X5	3.976
GM94X4	3.676
GM94X3	3.476
GM94X2	3.101
MODEL NO. "A" MAX.	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTION DECIMAL ANGLES ±1/64 .X ±.015 ±1° XX ±.010 XXX±.005	FILE: 150-33
	DRAFTED BY: RJS DATE: 4/30/83
BREAK ALL SHARP EDGES	ENGINEERED BY: DLF
MATERIAL:	APPROVED BY:
	NEXT ASSY:
FINISH:	USED ON:

**PITTMAN**  
Pittman Engineering & Manufacturing Corp., PA, USA

TITLE:  
OUTLINE AND MOUNTING DIMENSIONS  
GM94XX STANDARD

DWG. NO. B-150-33 REV. F

SCALE: D.N.S. SHEET 1 OF 1