

SERIES GM9000: We have the GM9434H187-R1

Gearmotor Data

Item	Parameter	Symbol	Units	5.9:1	11.5:1	19.7:1	38.3:1	65.5:1	127.8:1	218.4:1	425.9:1	728.1:1	1419.8:1	2426.9:1	4732.5:1
1	Max. Load Standard Gears ¹	T _L	oz-in	175	175	175	175	175	175	175	175	175	175	175	175
2	Max. Load High-Torque Gears ¹	T _L	oz-in	300	300	300	300	300	300	300	300	300	300	300	300
3	Max. Load High-Torque, Wide Face Gears ¹	T _L	oz-in	N/A	N/A	500	500	500	500	500	500	500	500	N/A	N/A
4	GM9X12, No-Load Speed	S ₀	rpm	1399	717	420	215	126	64.6	37.8	19.4	11.3	5.8	3.4	1.7
5	GM9X32, No-Load Speed	S ₀	rpm	1189	610	357	183	107	54.9	32.1	16.5	9.6	4.9	2.9	1.5
6	GM9X13, No-Load Speed	S ₀	rpm	948	486	284	146	85.3	43.8	25.6	13.1	7.7	3.9	2.3	1.2
7	GM9X33, No-Load Speed	S ₀	rpm	1016	521	305	156	91.5	46.9	27.4	14.1	8.2	4.2	2.5	1.3
8	GM9X14, No-Load Speed	S ₀	rpm	1300	667	390	200	117	60.0	35.1	18.0	10.5	5.4	3.2	1.6
9	GM9X34, No-Load Speed	S ₀	rpm	1043	535	313	160	93.9	48.1	28.2	14.4	8.5	4.3	2.5	1.3
10	GM9X35, No-Load Speed	S ₀	rpm	907	465	272	140	82	41.9	24.5	12.6	7.3	3.8	2.2	1.1
11	GM9X36, No-Load Speed	S ₀	rpm	834	427	250	128	75	38.5	22.5	11.5	6.8	3.5	2.0	1.0
12	GM9X37, No-Load Speed	S ₀	rpm	904	464	271	139	81	41.7	24.4	12.5	7.3	3.8	2.2	1.1
13	Gearbox Shaft Rotation ²	-	-	CW	CW	CCW	CCW	CW	CW	CCW	CCW	CW	CW	CCW	CCW
14	Gearbox Efficiency	-	%	81	81	73	73	66	66	59	59	53	53	48	48
15	Gearbox Weight (STD & HT) ³	W _G	oz	5.90	5.90	6.26	6.26	6.62	6.62	6.98	6.98	7.34	7.34	8.18	8.18
16	Gearbox Weight (HTWF) ⁴	W _G	oz	N/A	N/A	6.52	6.52	6.88	6.88	7.24	7.24	8.08	8.08	N/A	N/A
17	Gearbox Length (STD & HT)	L ₂	in max	1.373	1.373	1.373	1.373	1.373	1.373	1.373	1.373	1.373	1.373	1.528	1.528
18	Gearbox Length (HTWF)	L ₂	in max	N/A	N/A	1.373	1.373	1.373	1.373	1.373	1.373	1.528	1.528	N/A	N/A
19	Length, GM92X2/GM94X2 (STD & HT)	L ₃	in max	3.101	3.101	3.101	3.101	3.101	3.101	3.101	3.101	3.101	3.101	3.256	3.256
20	Length, GM92X2/GM94X2 (HTWF)	L ₃	in max	N/A	N/A	3.101	3.101	3.101	3.101	3.101	3.101	3.256	3.256	N/A	N/A
21	Length, GM92X3/GM94X3 (STD & HT)	L ₃	in max	3.476	3.476	3.476	3.476	3.476	3.476	3.476	3.476	3.476	3.476	3.631	3.63
22	Length, GM92X3/GM94X3 (HTWF)	L ₃	in max	N/A	N/A	3.476	3.476	3.476	3.476	3.476	3.476	3.631	3.631	N/A	N/A
23	Length, GM92X4/GM94X4 (STD & HT)	L ₃	in max	3.676	3.676	3.676	3.676	3.676	3.676	3.676	3.676	3.676	3.676	3.831	3.831
24	Length, GM92X4/GM94X4 (HTWF)	L ₃	in max	N/A	N/A	3.676	3.676	3.676	3.676	3.676	3.676	3.831	3.831	N/A	N/A
25	Length, GM9235/GM9435 (STD & HT)	L ₃	in max	3.976	3.976	3.976	3.976	3.976	3.976	3.976	3.976	3.976	3.976	4.131	4.131
26	Length, GM9235/GM9435 (HTWF)	L ₃	in max	N/A	N/A	3.976	3.976	3.976	3.976	3.976	3.976	4.131	4.131	N/A	N/A
27	Length, GM9236/GM9436 (STD & HT)	L ₃	in max	4.326	4.326	4.326	4.326	4.326	4.326	4.326	4.326	4.326	4.326	4.481	4.481
28	Length, GM9236/GM9436 (HTWF)	L ₃	in max	N/A	N/A	4.326	4.326	4.326	4.326	4.326	4.326	4.481	4.481	N/A	N/A
29	Length, GM9237/GM9437 (STD & HT)	L ₃	in max	4.626	4.626	4.626	4.626	4.626	4.626	4.626	4.626	4.626	4.626	4.781	4.781
30	Length, GM9237/GM9437 (HTWF)	L ₃	in max	N/A	N/A	4.626	4.626	4.626	4.626	4.626	4.626	4.781	4.781	N/A	N/A

¹Represents gearbox capability only. Continuous load torque capability will vary with gear ratio, motor selection, and operating conditions.

²Shaft rotation is designated while looking at output shaft with motor operating in a clockwise direction.

³Standard and High Torque

⁴High-Torque, Wide Face

Motor Data

Item	Parameter	Symbol	Units	9X12	9X32	9X13	9X33	9X14	9X34	9X35	9X36	9X37
31	Continuous Torque (Stall) ¹	T _C	oz-in	1.58	2.30	3.20	4.70	3.93	6.10	6.9	9.5	11.5
32	Peak Torque (Stall)	T _P	oz-in	8.35	13.8	15.6	31.6	23.9	41.3	49.4	61.8	77.0
33	Friction Torque	T _F	oz-in	0.40	0.50	0.50	0.60	0.50	0.60	0.65	0.80	0.80
34	No-Load Speed	S ₀	rpm	8251	7015	5592	5993	7666	6151	5348	4916	5331
35	Armature/Rotor Inertia	J _M	oz-in-s ²	2.2 X 10 ⁻⁴	2.7 X 10 ⁻⁴	3.9 X 10 ⁻⁴	4.6 X 10 ⁻⁴	5.4 X 10 ⁻⁴	5.9 X 10 ⁻⁴	7.9 X 10 ⁻⁴	1.0 X 10 ⁻³	1.2 X 10 ⁻³
36	Electrical Time Constant	τ _E	ms	0.53	0.63	0.74	0.84	0.80	0.85	0.00	1.06	1.06
37	Mechanical Time Constant	τ _M	ms	22.8	14.4	14.7	9.29	18.1	9.25	10.9	8.5	8.88
38	Viscous Damping–Infinite Source Impedance	D	oz-in/krpm	0.0086	0.0272	0.0113	0.0335	0.0125	0.0387	0.0450	0.0525	0.0550
39	Viscous Damping–Zero Source Impedance	K _D	oz-in/krpm	1.00	1.94	2.78	5.23	3.11	6.68	7.6	12.5	14.4
40	Maximum Winding Temperature	θ _{MAX}	°C	155	155	155	155	155	155	155	155	155
41	Thermal Impedance	R _{TH}	°C/watt	22.7	22.7	19.1	19.1	17.1	17.1	14.7	13.5	11.2
42	Thermal Time Constant	τ _{TH}	min	7.21	7.21	11.1	11.1	12.0	12.0	12.9	13.5	13.8
43	Motor Weight	W _M	oz	6.96	6.98	8.98	8.90	10.1	10.1	0.0	13.8	15.5
44	Motor Constant	K _M	oz-in/√W	1.16	1.62	1.94	2.66	2.05	3.01	3.21	4.11	4.41
45	Motor Length, 92XX, 94XX	L ₁	in max	1.828	1.828	2.203	2.203	2.403	2.403	2.703	3.053	3.353

¹Continuous torque specified at 25°C ambient temperature and without additional heat sink.

Model GM9XX2 Winding Data (other windings available upon request)

Item	Parameter	Symbol	Units	GM9X12				GM9X32			
46	Reference Voltage	E	V	12.0	19.1	24.0	30.3	12.0	19.1	24.0	30.3
47	Torque Constant	K _T	oz-in/A	1.86	2.95	3.72	4.68	2.20	3.50	4.40	5.53
48	Back-EMF Constant	K _E	V/krpm	1.38	2.18	2.75	3.46	1.63	2.59	3.25	4.09
49	Resistance	R _T	Ω	2.63	6.45	10.2	16.1	1.93	4.70	7.38	11.6
50	Inductance	L	mH	1.35	3.40	5.42	8.56	1.16	2.94	4.64	7.34
51	No-Load Current	I ₀	A	0.26	0.16	0.13	0.10	0.32	0.20	0.16	0.13
52	Peak Current (Stall)	I _P	A	4.56	2.96	2.35	1.88	6.22	4.06	3.25	2.60

Model GM9XX3 Winding Data (other windings available upon request)

Item	Parameter	Symbol	Units	GM9X13				GM9X33			
53	Reference Voltage	E	V	12.0	19.1	24.0	30.3	12.0	19.1	24.0	30.3
54	Torque Constant	K _T	oz-in/A	2.80	4.47	5.60	7.07	2.67	4.20	5.28	6.68
55	Back-EMF Constant	K _E	V/krpm	2.07	3.31	4.14	5.23	1.98	3.10	3.90	4.94
56	Resistance	R _T	Ω	2.17	5.32	8.33	13.2	1.08	2.53	3.94	6.21
57	Inductance	L	mH	1.54	3.93	6.17	9.84	0.84	2.08	3.29	5.27
58	No-Load Current	I ₀	A	0.20	0.13	0.10	0.08	0.30	0.19	0.15	0.12
59	Peak Current (Stall)	I _P	A	5.54	3.59	2.88	2.30	11.1	7.55	6.09	4.88

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Model GM9XX4 Winding Data (Other windings available upon request)

Item	Parameter	Symbol	Units	GM9X14				GM9X34			
60	Reference Voltage	E	V	12.0	19.1	24.0	30.3	12.0	19.1	24.0	30.3
61	Torque Constant	K_T	oz-in/A	2.06	3.27	4.13	5.22	2.58	4.07	5.17	6.50
62	Back-EMF Constant	K_E	V/krpm	1.53	2.42	3.05	3.86	1.91	3.01	3.82	4.81
63	Resistance	R_T	Ω	1.10	2.59	4.06	6.40	0.83	1.89	2.96	4.62
64	Inductance	L	mH	0.81	2.04	3.25	5.19	0.63	1.56	2.51	3.97
65	No-Load Current	I_0	A	0.29	0.18	0.14	0.11	0.33	0.21	0.16	0.13
66	Peak Current (Stall)	I_p	A	10.9	7.36	5.91	4.73	14.5	10.1	8.11	6.55

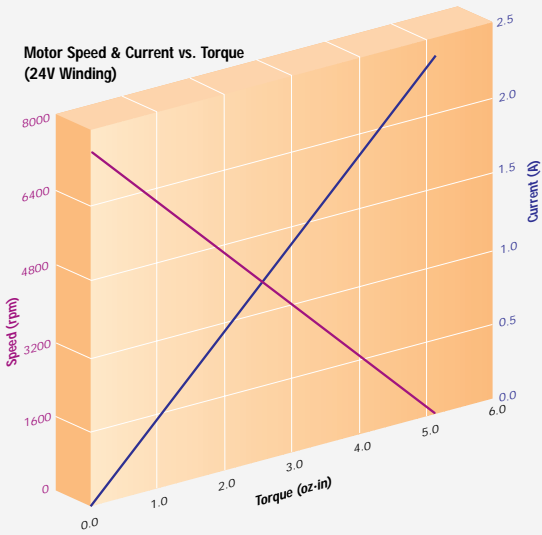
Model GM9X35/GM9X36 Winding Data (Other windings available upon request)

Item	Parameter	Symbol	Units	GM9X35				GM9X36			
67	Reference Voltage	E	V	12.0	19.1	24.0	30.3	12.0	19.1	24.0	30.3
68	Torque Constant	K_T	oz-in/A	2.47	3.99	4.94	6.27	3.25	5.24	6.49	8.24
69	Back-EMF Constant	K_E	V/krpm	1.83	2.95	3.65	3.65	2.40	3.88	4.80	6.09
70	Resistance	R_T	Ω	0.68	1.56	2.37	3.72	0.71	1.64	2.49	3.91
71	Inductance	L	mH	TBD	TBD	TBD	TBD	0.66	1.72	2.63	4.24
72	No-Load Current	I_0	A	0.38	0.24	0.19	0.16	0.33	0.20	0.16	0.13
73	Peak Current (Stall)	I_p	A	17.6	12.2	10.1	8.14	16.9	11.7	9.64	7.74

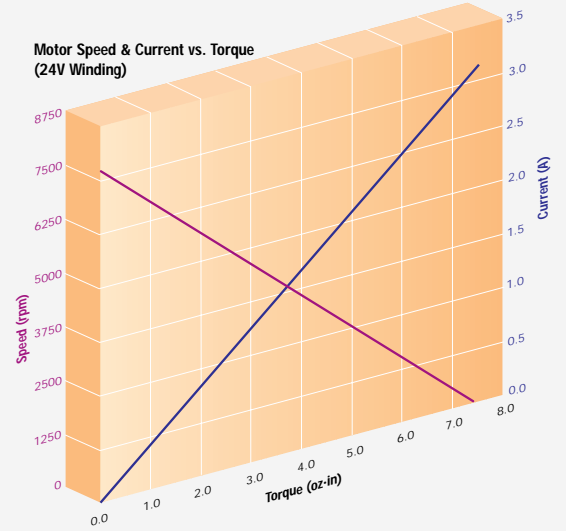
Model GM9X37 Winding Data (Other windings available upon request)

Item	Parameter	Symbol	Units	GM9X37			
74	Reference Voltage	E	V	12.0	19.1	24.0	30.3
75	Torque Constant	K_T	oz-in/A	3.00	4.72	6.00	7.43
76	Back-EMF Constant	K_E	V/krpm	2.22	3.49	4.44	5.50
77	Resistance	R_T	Ω	0.55	1.20	1.85	2.82
78	Inductance	L	mH	0.49	1.21	1.97	3.01
79	No-Load Current	I_0	A	0.37	0.23	0.18	0.15
80	Peak Current (Stall)	I_p	A	21.7	15.9	12.96	10.73

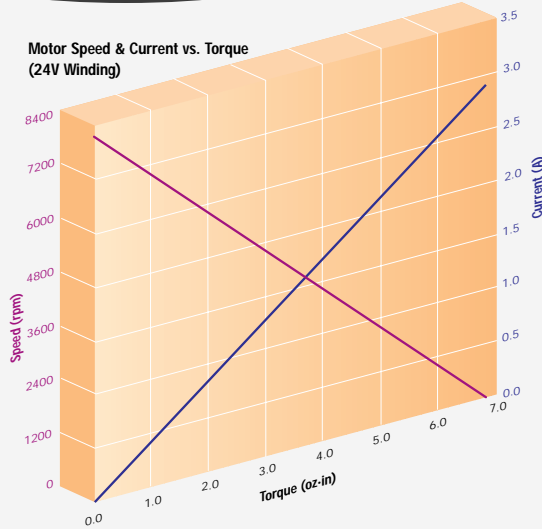
Model GM9X12



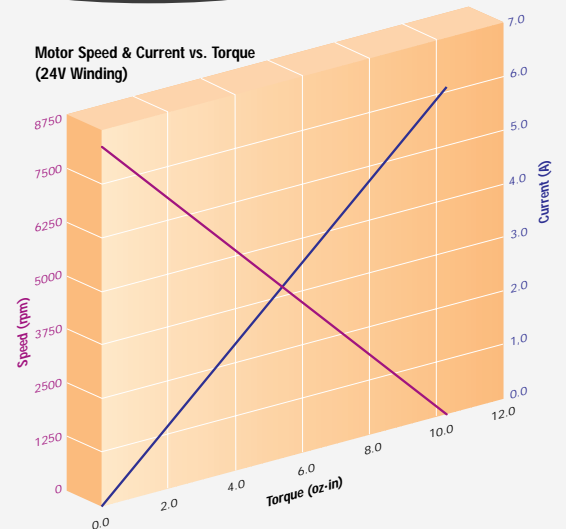
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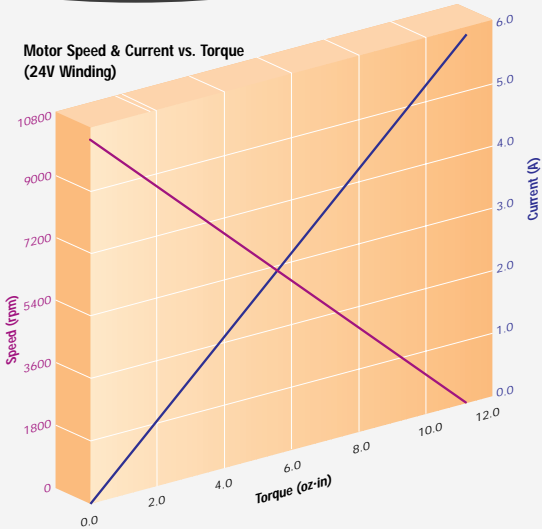
Model GM9X13



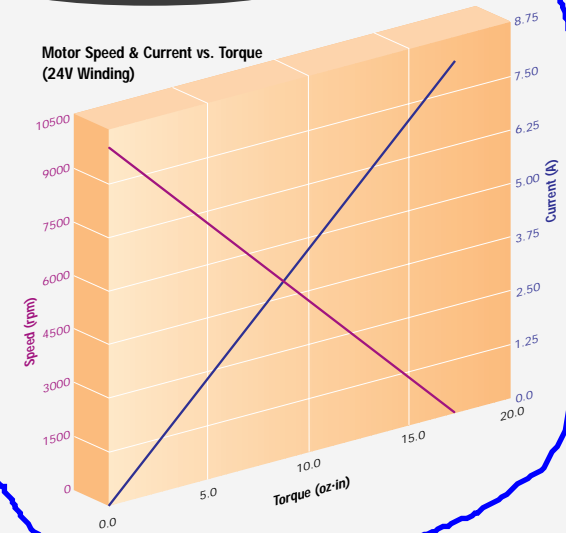
Model GM9X33



Model GM9X14

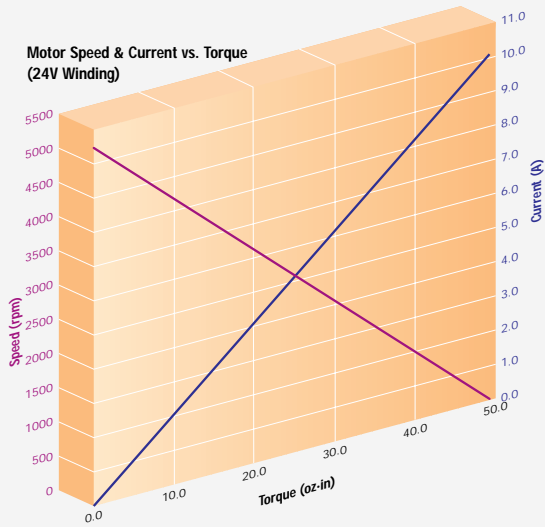


Model GM9X34

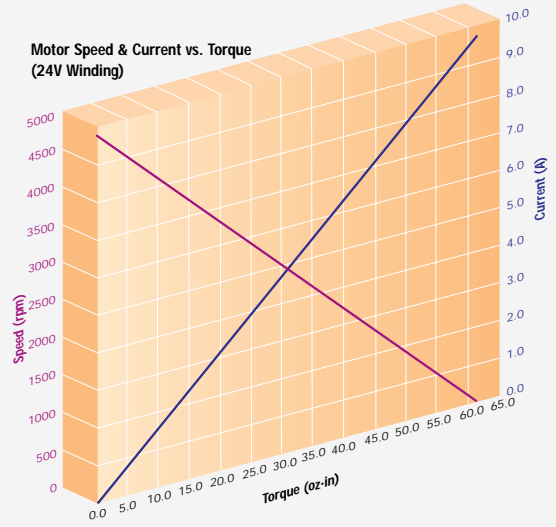


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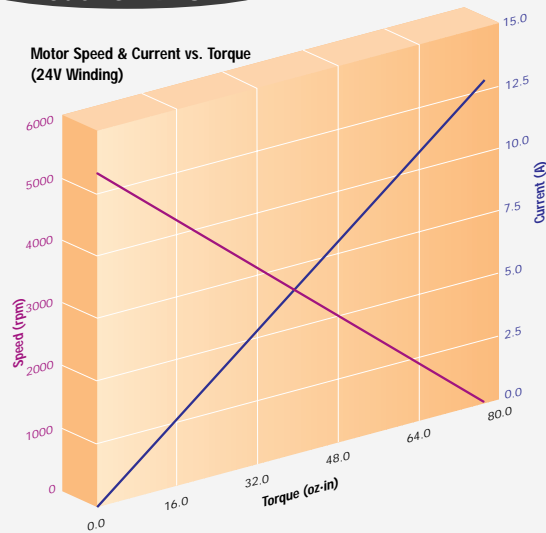
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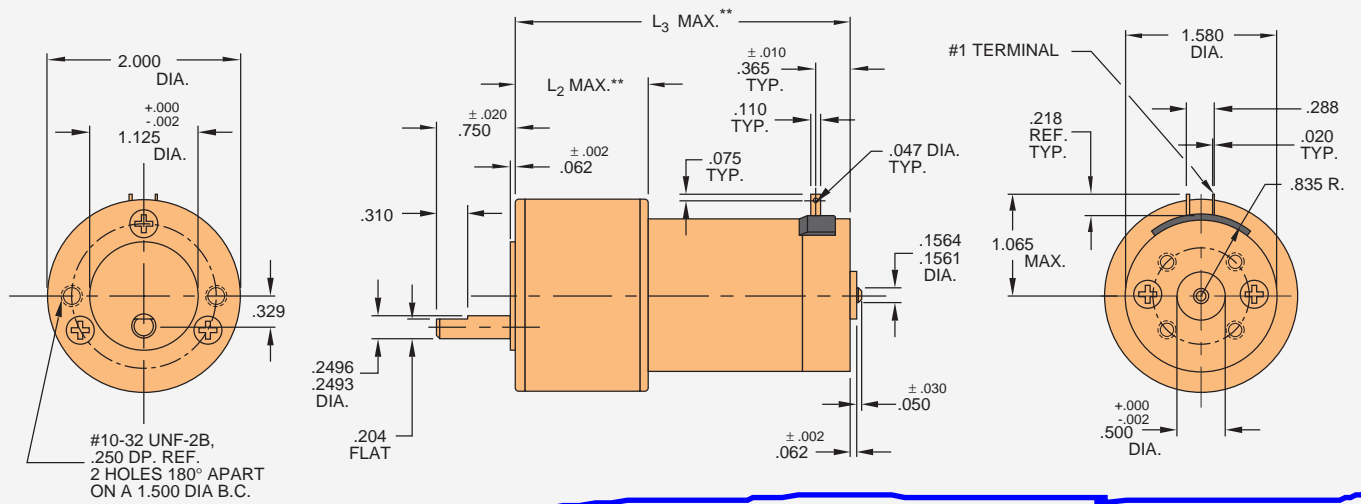
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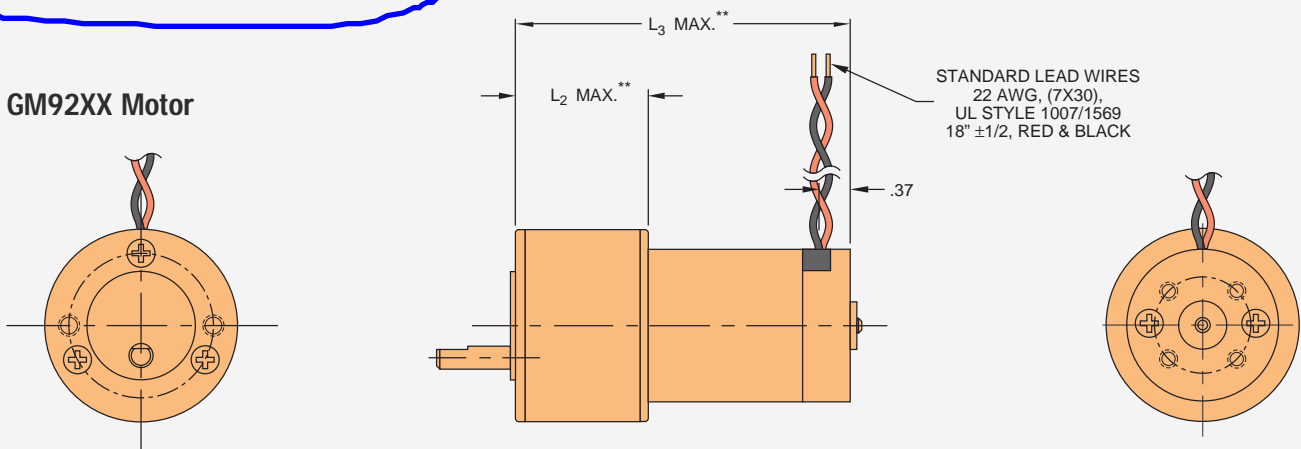
Model GM9X37



GM94XX Motor



GM92XX Motor



Notes:

- Unless otherwise specified, all tolerances are to be ±.005
- All measurements are in inches
- **See items 17 through 30 in gearmotor data chart

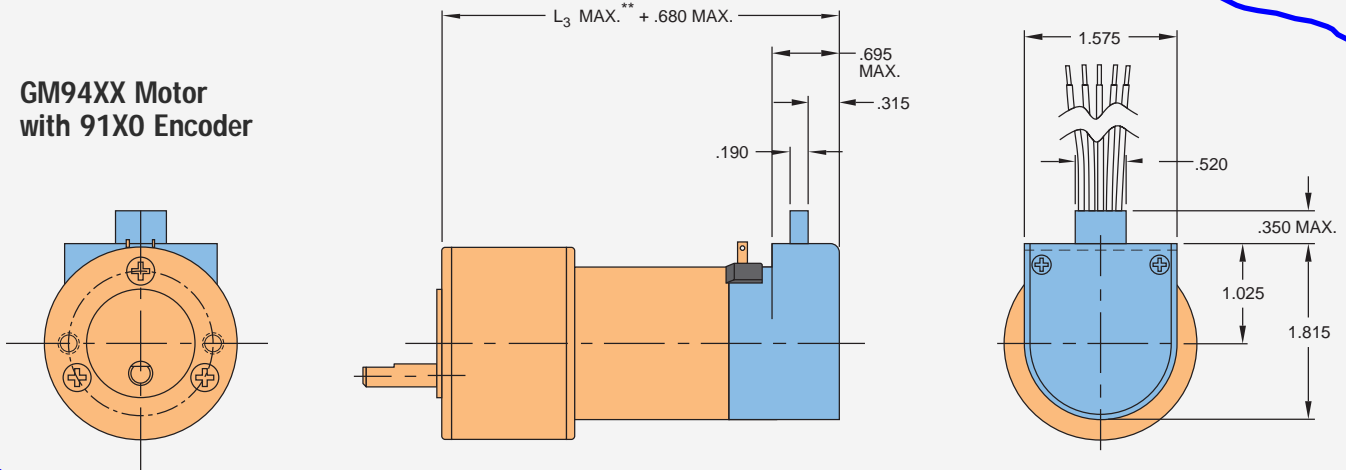
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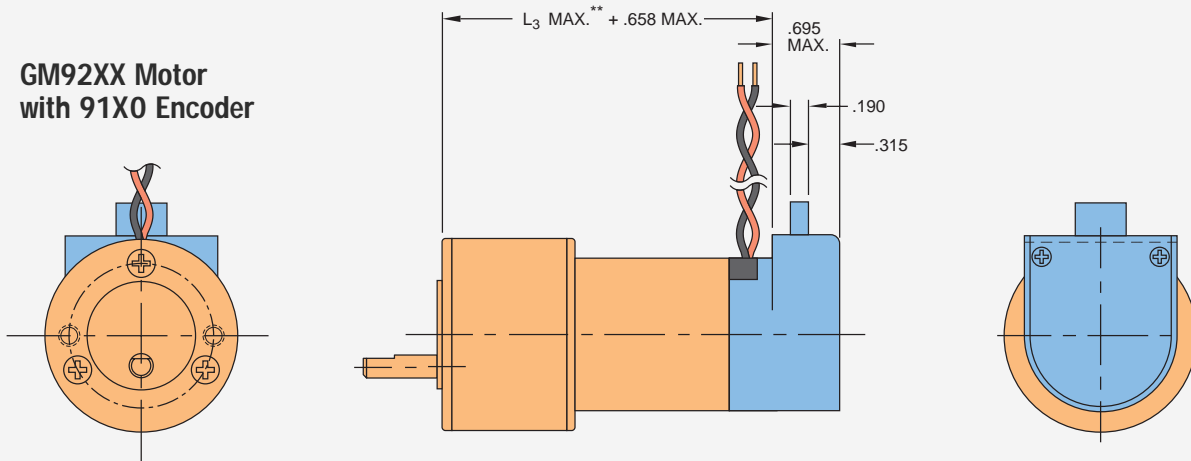
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SERIES GM9000

**GM94XX Motor
with 91X0 Encoder**



**GM92XX Motor
with 91X0 Encoder**



**Encoder
Connection Chart**

PIN NO.	COLOR	CONNECTION
1	BLACK	GROUND
2	GREEN	INDEX
3	YELLOW	CHANNEL A
4	RED	Vcc
5	BLUE	CHANNEL B

Notes:

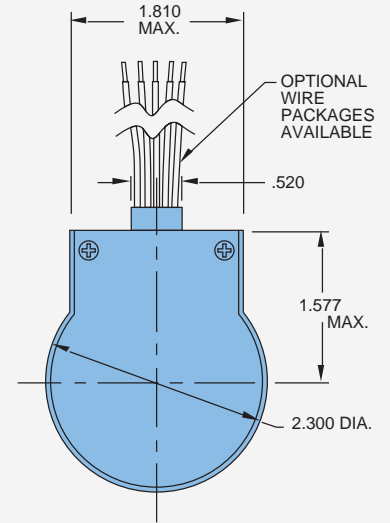
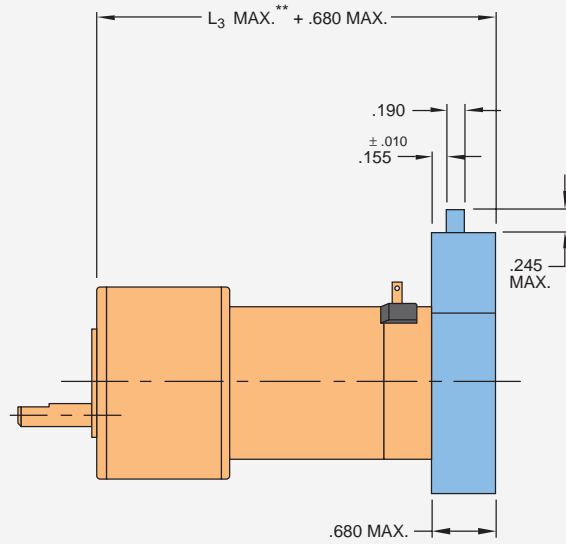
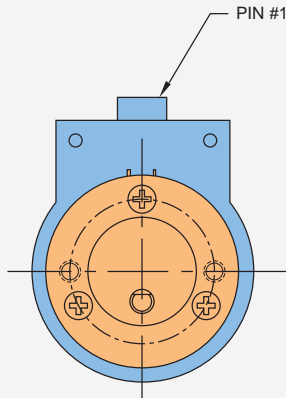
- Unless otherwise specified, all tolerances are to be $\pm .005$
- All measurements are in inches
- **See items 17 through 30 in gearmotor data chart

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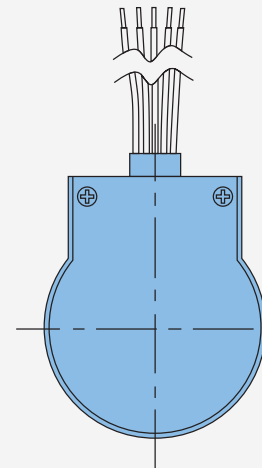
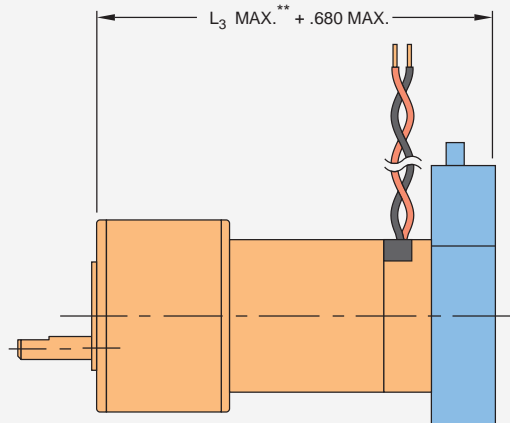
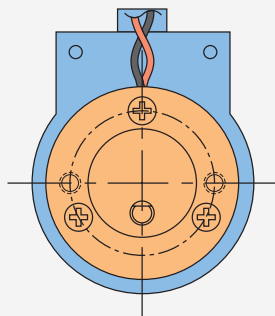
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**GM94XX Motor
with 90X0 Encoder**



**GM92XX Motor
with 90X0 Encoder**



**Encoder
Connection Chart**

PIN NO.	COLOR	CONNECTION
1	BLACK	GROUND
2	GREEN	INDEX
3	YELLOW	CHANNEL A
4	RED	Vcc
5	BLUE	CHANNEL B

Notes:

- Unless otherwise specified, all tolerances are to be $\pm .005$
- All measurements are in inches
- **See items 17 through 30 in gearmotor data chart

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