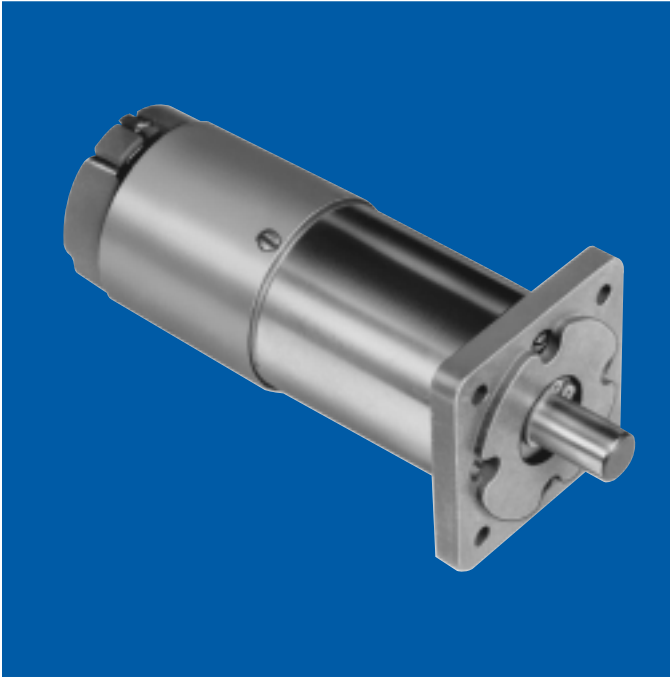


CMM & CLL GEARMOTORS

DC Permanent Magnet Planetary Gearmotors

E-2030



torque rating: 3.0 to 1,250 oz. in.

weight: 10 to 16 ounces depending on ratio

gears: Precision manufactured and heat treated for reliable performance and long life

shaft: Precision-ground No. 416 nitrided/stainless steel.

Options: length, smaller diameter, flats, pinions, gears, holes (through or tapped), threaded ends and tapers. Shaft material may change depending upon options selected

backlash: Varies with ratio, but average backlash is 3°

gear inertia: 1.2×10^{-5} oz. in. sec.² @ input max

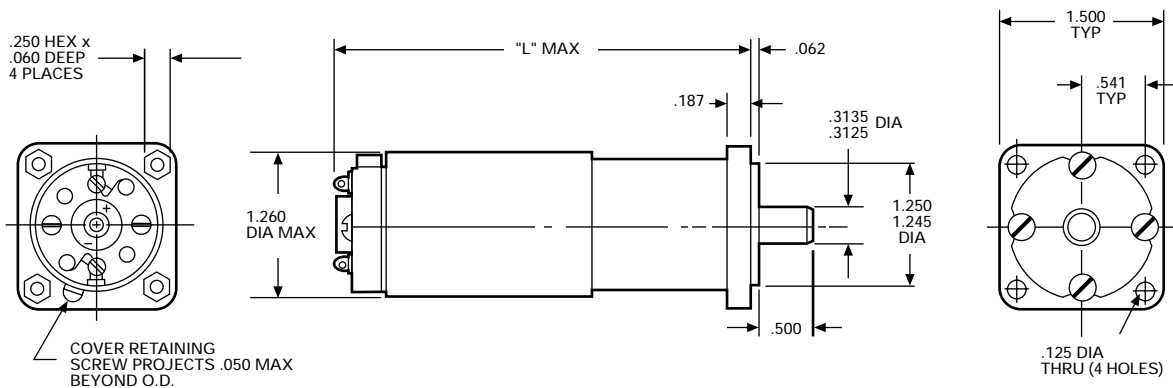
bearings: Motor output shaft is supported by life-lubricated ball bearings; gear train output shaft is supported by life-lubricated sleeve bearing

gearbox housing: Corrosion-resistant steel

mounting flange: Die-cast zinc

marking: Per MIL-STD-130

Dimensions



ROTATION (VIEWED FROM SHAFT END)

CCW - POSITIVE VOLTAGE TO (+), NEGATIVE VOLTAGE TO (-)

CW - REVERSE POLARITY

NOTE: Consult factory prior to preparing spec control prints. Dimensions are for reference only

Standard Part Numbers and Data

SPEED REDUCTION RATIO	TORQUE MULTIPLIER	MAX CONT. TORQUE (oz. in.)	TYPE CMM GEARMOTOR		TYPE CLL GEARMOTOR	
			Dim. "L" (in.)	STANDARD PART NUMBER PREFIX*	Dim. "L" (in.)	STANDARD PART NUMBER PREFIX*
4:1	3.0	5.1	2.86	317A102	3.22	319A100
5:1	3.8	6.5	2.86	317A103	3.22	319A101
6:1	4.5	7.7	2.86	317A104	3.22	319A102
16:1	10.0	17.0	3.11	317A105	3.45	319A103
20:1	13.0	22.0	3.11	317A106	3.45	319A104
24:1	15.0	26.0	3.11	317A107	3.45	319A105
25:1	16.0	27.0	3.11	317A108	3.45	319A106
30:1	19.0	32.0	3.11	317A109	3.45	319A107
36:1	23.0	39.0	3.11	317A110	3.45	319A108
64:1	33.0	56.0	3.34	317A111	3.69	319A109
80:1	41.0	70.0	3.34	317A112	3.69	319A110
96:1	49.0	83.0	3.34	317A113	3.69	319A111
100:1	51.0	87.0	3.34	317A114	3.69	319A112
120:1	61.0	104.0	3.34	317A115	3.69	319A113
125:1	64.0	109.0	3.34	317A116	3.69	319A114
144:1	74.0	126.0	3.34	317A117	3.69	319A115
150:1	77.0	131.0	3.34	317A118	3.69	319A116
180:1	92.0	156.0	3.34	317A119	3.69	319A117
216:1	110.0	187.0	3.34	317A120	3.69	319A118
256:1	105.0	179.0	3.58	317A121	3.92	319A119
320:1	130.0	221.0	3.58	317A122	3.92	319A120
384:1	157.0	167.0	3.58	317A123	3.92	319A121
400:1	164.0	279.0	3.58	317A124	3.92	319A122
480:1	197.0	335.0	3.58	317A125	3.92	319A123
500:1	205.0	349.0	3.58	317A126	3.92	319A124
576:1	235.0	401.0	3.58	317A127	3.92	319A125
600:1	246.0	418.0	3.58	317A128	3.92	319A126
625:1	256.0	435.0	3.58	317A129	3.92	319A127
720:1	295.0	502.0	3.58	317A130	3.92	319A128
750:1	306.0	520.0	3.58	317A131	3.92	319A129
864:1	352.0	598.0	3.58	317A132	3.92	319A130
900:1	370.0	629.0	3.58	317A133	3.92	319A131
1,024:1	334.0	568.0	3.81	317A134	4.16	319A132
1,080:1	442.0	757.0	3.58	317A135	3.92	319A133
1,280:1	416.0	707.0	3.81	317A136	4.16	319A134
1,296:1	530.0	901.0	3.58	317A137	3.92	319A135
1,536:1	500.0	850.0	3.81	317A138	4.16	319A136
1,600:1	522.0	887.0	3.81	317A139	4.16	319A137
1,920:1	625.0	1,063	3.81	317A140	4.16	319A138
2,000:1	652.0	1,108	3.81	317A141	4.16	319A139
2,304:1	750.0	1,250	3.81	317A142	4.16	319A140
2,400:1	780.0	1,250	3.81	317A143	4.16	319A141
2,500:1	815.0	1,250	3.81	317A144	4.16	319A142
2,880:1	940.0	1,250	3.81	317A145	4.16	319A143
3,000:1	980.0	1,250	3.81	317A146	4.16	319A144
3,125:1	1,020	1,250	3.81	317A147	4.16	319A145
3,456:1	1,130	1,250	3.81	317A148	4.16	319A146
3,600:1	1,170	1,250	3.81	317A149	4.16	319A147
3,750:1	1,220	1,250	3.81	317A150	4.16	319A148
4,096:1	1,070	1,250	4.03	317A151	4.39	319A149
4,320:1	1,410	1,250	3.81	317A152	4.16	319A150
4,500:1	1,470	1,250	3.81	317A153	4.16	319A151
5,120:1	1,340	1,250	4.03	317A154	4.39	319A152
5,184:1	1,690	1,250	3.81	317A155	4.16	319A153
5,400:1	1,760	1,250	3.81	317A156	4.16	319A154

*NOTE: Standard part numbers and data continued on page 12 and 13

CMM & CLL GEARMOTORS

DC Permanent Magnet Planetary Gearmotors

E-2030

Standard Part Numbers and Data

SPEED REDUCTION RATIO	TORQUE MULTIPLIER	MAX CONT. TORQUE (oz. in.)	TYPE CMM GEARMOTOR		TYPE CLL GEARMOTOR	
			Dim. "L" (in.)	STANDARD PART NUMBER PREFIX*	Dim. "L" (in.)	STANDARD PART NUMBER PREFIX*
6,144:1	1,610	1,250	4.03	317A157	4.39	319A155
6,400:1	1,680	1,250	4.03	317A158	4.39	319A156
6,480:1	2,110	1,250	3.81	317A159	4.16	319A157
7,680:1	2,010	1,250	4.03	317A160	4.39	319A158
7,776:1	2,530	1,250	3.81	317A161	4.16	319A159
8,000:1	2,100	1,250	4.03	317A162	4.39	319A160
9,216:1	2,390	1,250	4.03	317A163	4.39	319A161
9,600:1	2,520	1,250	4.03	317A164	4.39	319A162
10,000:1	2,620	1,250	4.03	317A165	4.39	319A163
11,520:1	3,010	1,250	4.03	317A166	4.39	319A164
12,000:1	3,140	1,250	4.03	317A167	4.39	319A165
12,500:1	3,280	1,250	4.03	317A168	4.39	319A166
13,824:1	3,620	1,250	4.03	317A169	4.39	319A167
14,400:1	3,780	1,250	4.03	317A170	4.39	319A168
15,000:1	3,940	1,250	4.03	317A171	4.39	319A169
15,625:1	4,100	1,250	4.03	317A172	4.39	319A170
17,280:1	4,520	1,250	4.03	317A173	4.39	319A171
18,000:1	4,710	1,250	4.03	317A174	4.39	319A172
18,750:1	4,910	1,250	4.03	317A175	4.39	319A173
20,736:1	5,430	1,250	4.03	317A176	4.39	319A174
21,600:1	5,660	1,250	4.03	317A177	4.39	319A175
22,500:1	4,900	1,250	4.03	317A178	4.39	319A176
25,920:1	6,790	1,250	4.03	317A179	4.39	319A177
27,000:1	7,070	1,250	4.03	317A180	4.39	319A178
31,104:1	8,150	1,250	4.03	317A181	4.39	319A179
32,400:1	8,500	1,250	4.03	317A182	4.39	319A180
38,880:1	10,200	1,250	4.03	317A183	4.39	319A181
46,656:1	12,200	1,250	4.03	317A184	4.39	319A182

Maximum continuous rated torque values are based upon motor temperature rise considerations. Starting or impact loads greater than 10 times the rated maximum continuous torque (1,500 oz. in. maximum) could result in gear or shaft damage

*When You Order

Each of the basic motor armature windings (see chart, next page) can be used with any of the gear ratios listed in the two preceding charts. To order, state the gear train standard part number prefix, plus a motor armature winding dash number. EXAMPLE: 317A112-24 is a 80:1 CMM gear train with a "-24" armature winding, 12 volts, 18,000 rpm, .50 oz. in. torque, etc.

Basic Motor Data

VOLTAGE (VDC)	SPEED no load (rpm)	TORQUE		CURRENT			CONSTANTS		STANDARD PART NUMBERS*
		max rated (oz. in.)	** theoretical stall (oz. in.)	max no load (amps)	max rated load (amps)	** nominal stall (amps)	K _T (oz. in./amp)	R (ohms)	
Type CMM Motors									
6	12,000-14,000	.75	4.5	1.120	2.00	9.9	.58	.66	-5
12	18,000-21,400	.50	6.8	.820	1.20	11.8	.77	1.11	-24
12	14,500-17,000	.70	4.0	.700	1.20	7.5	.97	1.75	-3
12	12,400-14,700	.75	4.7	.610	1.20	5.1	1.12	2.56	-21
12	11,000-13,000	1.00	4.0	.520	1.20	4.6	1.26	2.87	-4
24	19,200-22,800	.35	7.3	.470	.60	6.3	1.45	4.17	-7
24	16,000-19,000	.60	4.8	.370	.60	3.8	1.74	6.30	-1
24	11,500-14,000	1.00	4.0	.260	.60	2.1	2.42	11.02	-2
24	10,700-12,700	1.00	4.1	.225	.60	1.6	2.60	15.00	-8
24	9,600-11,400	1.00	3.6	.220	.50	1.1	2.90	21.00	-22
24	8,000-10,000	1.00	3.0	.190	.45	.93	3.48	25.20	-10
24	6,000-7,000	.80	2.4	.140	.30	.55	4.65	42.30	-11
50	14,300-17,000	.70	5.4	.160	.30	1.30	4.06	37.00	-25
50	9,500-11,500	1.00	3.5	.120	.30	.71	6.00	69.00	-16
50	8,000-10,000	1.00	2.8	.100	.20	.50	6.77	98.00	-12
50	6,700-8,000	.80	2.5	.080	.16	.30	8.71	159.00	-15
50	4,600-5,500	.80	1.7	.060	.12	.20	10.83	249.00	-13

Type CLL Motors

6	7,600-9,400	1.60	6.0	.860	2.00	7.00	.90	.80	-5
12	11,500-14,000	1.10	8.0	.730	1.70	8.40	1.20	1.35	-24
12	9,000-11,000	1.70	5.2	.510	1.20	5.30	1.51	2.13	-3
24	16,000-19,000	.75	8.8	.530	1.00	7.30	1.74	3.12	-21
24	14,000-17,000	.85	7.8	.440	.85	6.50	1.96	3.50	-4
24	12,000-14,500	1.00	7.5	.380	.80	4.50	2.26	5.08	-7
24	10,400-12,300	1.10	6.2	.320	.75	3.30	2.71	7.68	-1
24	7,400-8,900	1.60	5.5	.240	.70	1.70	3.77	13.43	-2
24	6,900-8,200	1.80	3.8	.210	.65	1.20	4.05	18.28	-8
24	6,200-7,400	1.80	3.4	.190	.60	.89	4.52	25.59	-22
24	5,200-6,200	1.20	4.8	.170	.45	.74	5.42	30.70	-10
50	7,600-9,400	1.50	7.5	.110	.25	.92	7.25	51.55	-11
75	14,000-17,000	1.00	8.6	.10	.29	1.60	6.33	45.10	-25
75	9,000-11,000	1.70	6.8	.07	.29	.85	9.36	84.10	-16
75	8,000-10,000	1.80	5.4	.06	.26	.60	10.56	119.40	-12
75	6,500-8,000	1.20	4.3	.05	.20	.37	13.58	194.00	-15
75	4,500-5,300	1.00	3.4	.04	.10	.23	16.89	303.00	-13

**Because of brush drop and field distortion, current and torque indicated will not always be attainable

*When You Order

Each of the basic motor armature windings can be used with any of the gear ratios listed in the preceding charts. To order, state the gear train standard part number prefix, plus a motor armature winding dash number. EXAMPLE: 317A112-24 is a 80:1 CMM gear train with a "-24" armature winding, 12 volts, 18,000 rpm, .50 oz. in. torque, etc.