

BD/BL GEARMOTORS

DC Permanent Magnet Planetary Gearmotors

A-2430



general design specification

torque rating:

1.875" flange:	3.00" flange:
100 lb. in., continuous duty	550 lb. in., continuous duty

weight:

1.875" flange:	3.00" flange:
1.4 to 2.0 lbs. depending on ratio	5.6 to 6.3 lbs. depending on ratio

gears: Planetary gearing system. All gears are heat treated and ride on ball or roller bearings for greatest efficiency and long life

shaft: Carbon steel shaft per ASTM A304 with 18-tooth spline serrations per ANS B92.1-1970 heat-treated to RC 45-48 (1.875" flange) and RC 29-33 (3.00" flange)

backlash: Varies with reduction but average unit will have less than 3°

gear inertia: 1.4×10^{-5} oz. in. sec.² @ input max

bearings: Output shaft uses double-shielded, life-lubricated ball bearings for -55°C to +85°C operation. Special lubricants available for temperature extremes

cables/leads: 8" shielded cable per MIL-C-7078 #22 AWG conductor per MIL-W-16878/4

mounting flange: Cold drawn steel

geartrain housing: Stress-proof steel

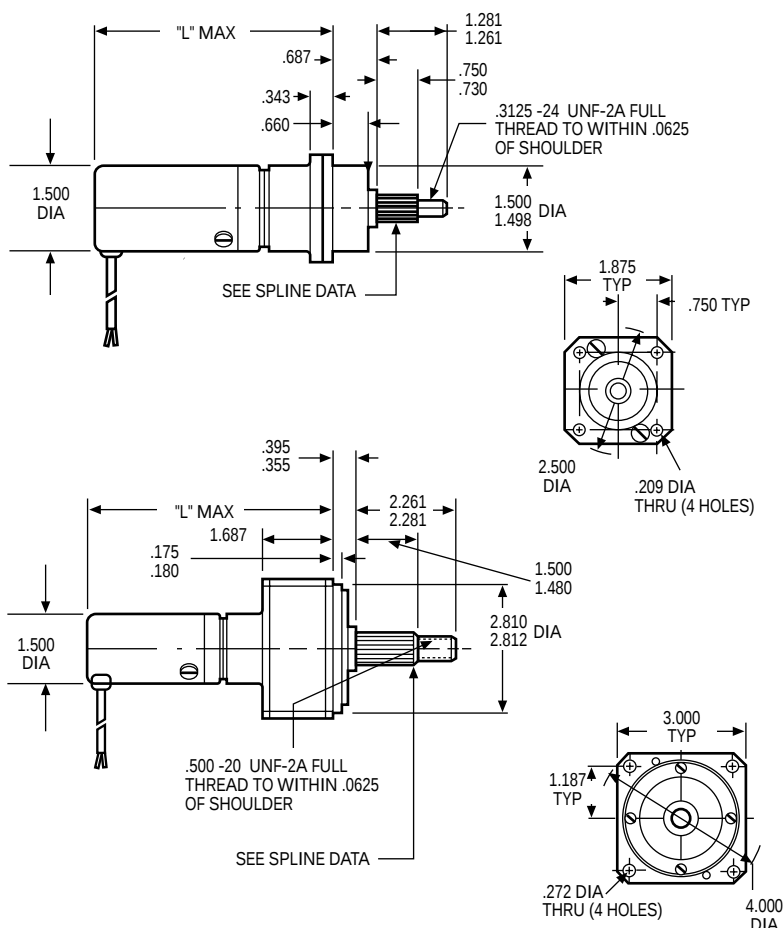
marking: Per MIL-STD-130

life: 1,000 hours continuous duty for 27 VDC units

options available:

- Electromechanical brakes
- RFI filters to meet MIL-I-6181, MIL-1-26600 or MIL-STD-461
- Integral tachometer generators (see Bulletins A-2415 and A-2416 for details)

Dimensions



ROTATION (VIEWED FROM SHAFT END)

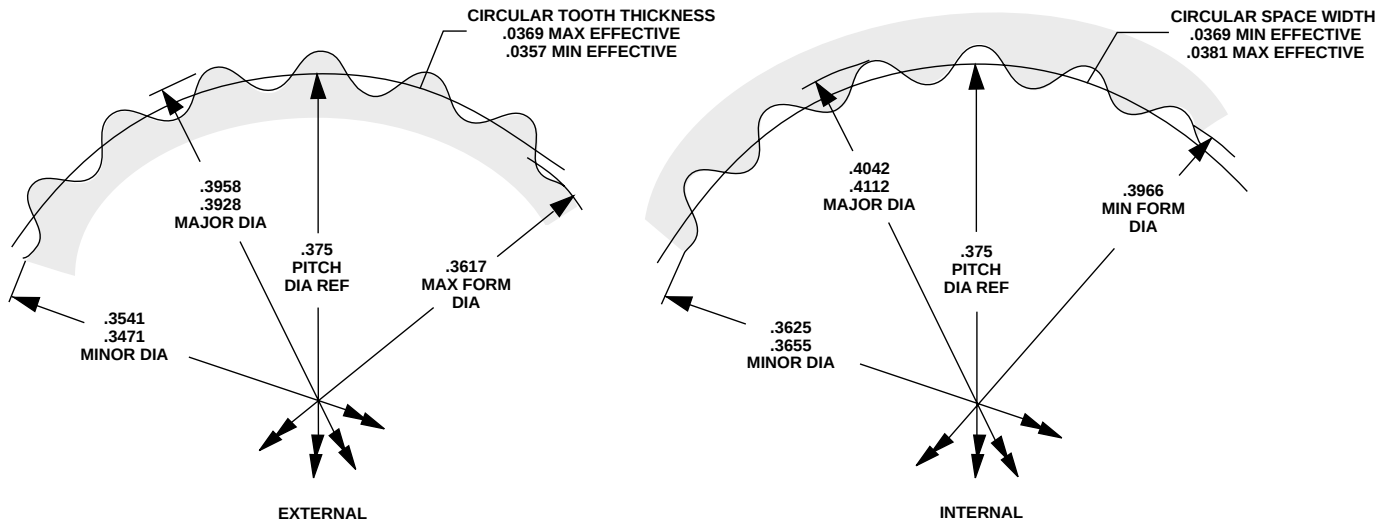
CCW - POSITIVE VOLTAGE TO RED (+), NEGATIVE VOLTAGE TO BLACK (-)

CW - REVERSE POLARITY

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

Spline Data

1.875" Flange



INVOLUTE SPLINE PER ANS B92.1-1970 (GLOBE SPEC 3S95)

18 TEETH

48/96 PITCH

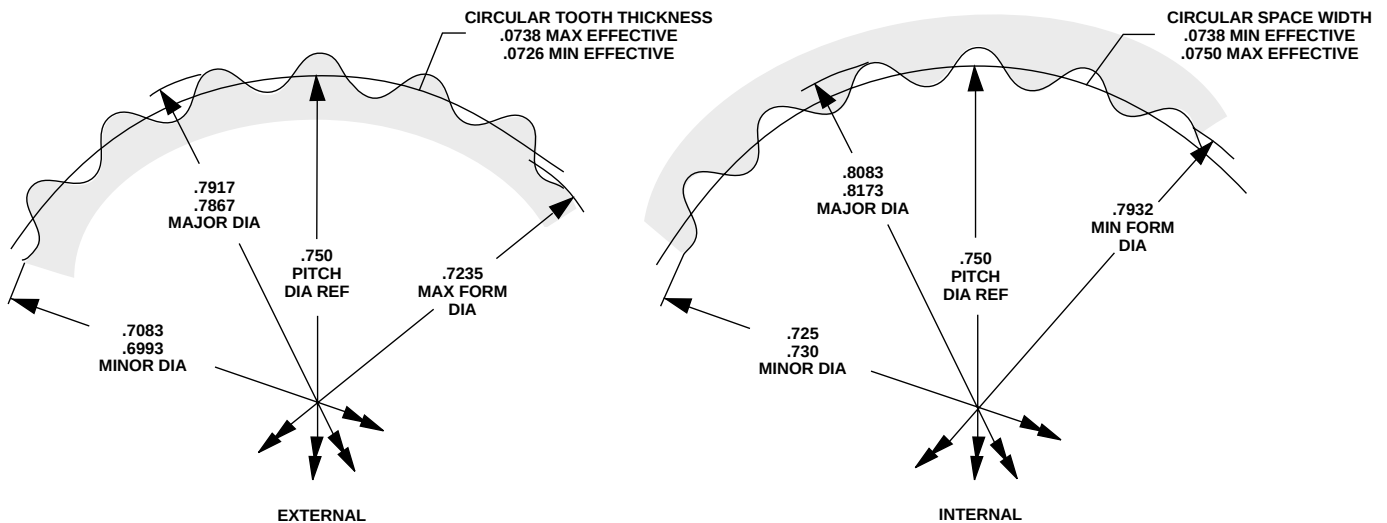
45° PRESSURE ANGLE

EXTERNAL SPLINE — MIN DIMENSION OVER TWO .040" DIA PINS .4398" REF

INTERNAL SPLINE — MAX DIMENSION BETWEEN TWO .040" DIA PINS .3174" REF

NOTE: FOR PROTOTYPES, GLOBE MOTORS WILL BROACH THRU-HOLES FOR NON-HARDENED MATING PARTS WITH AN I.D. OF .3575/.3585" AS A STARTING DIAMETER

3.00" Flange



INVOLUTE SPLINE PER ANS B92.1-1970 (GLOBE SPEC 3S96)

18 TEETH

24/48 PITCH

45° PRESSURE ANGLE

EXTERNAL SPLINE — MIN DIMENSION OVER TWO .080" DIA PINS .8819" REF

INTERNAL SPLINE — MAX DIMENSION BETWEEN TWO .080" DIA PINS .6321" REF

NOTE: FOR PROTOTYPES, GLOBE MOTORS WILL BROACH THRU-HOLES FOR NON-HARDENED MATING PARTS WITH AN I.D. OF .7195/.7205" AS A STARTING DIAMETER

BD & BL GEARMOTORS

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A-2430

Standard Part Numbers and Data

1.875" Flange

SPEED REDUCTION RATIO	TORQUE MULTI- PLIER	MAX. CONT. RATING (lb. in.)	TYPE BD		TYPE BL	
			"L" max (in.)	STD. PART NO. PREFIX*	"L" MAX (in.)	STD. PART NO. PREFIX*
3.81:1 5.54:1	3.5 5.1	1.1 1.6	3.34	102A152 102A153	3.72	102A170 102A171
14.5:1 21.1:1 30.7:1	13.0 19.0 27.0	4.1 6.0 8.6		102A156 102A157 102A158		102A174 102A175 102A176
55.3:1 80.4:1 117:1 170:1	47.0 68.0 99.0 144.0	14.6 21.0 31.0 45.0	4.09	102A160 102A161 102A162 102A163	4.47	102A178 102A179 102A180 102A181
211:1 306:1 445:1 647:1 941:1	171.0 248.0 360.0 524.0 762.0	53.0 77.0 100.0 100.0 100.0		102A189 102A190 102A191 102A192 102A193		102A199 102A200 102A201 102A202 102A203
1,166:1 1,696:1 2,466:1 3,584:1 5,211:1	896.0 1,305 1,900 2,760 4,000	100.0 100.0 100.0 100.0 100.0	4.47	102A1061 102A1062 102A1063 102A1064 102A1065	4.85	102A1066 102A1067 102A1068 102A1069 102A1070

3.00" Flange

SPEED REDUCTION RATIO	TORQUE MULTI- PLIER	MAX. CONT. RATING (lb. in.)	TYPE BD		TYPE BL	
			"L" max (in.)	STD. PART NO. PREFIX*	"L" MAX (in.)	STD. PART NO. PREFIX*
306:1 445:1 647:1 941:1	248 360 524 762	77 122 164 238	5.38	102A929 102A930 102A931 102A932	5.75	102A939 102A940 102A941 102A942
1,166:1 1,696:1 2,466:1 3,584:1 5,211:1	896 1,305 1,900 2,760 4,000	280 407 550 550 550		102A933 102A934 102A935 102A936 102A937		102A943 102A944 102A945 102A946 102A947

Max Cont. Torque: The values in this column are based upon gear train strength and capability for 1,000 hrs. minimum life

Max rated torque of motor selected x torque multiplier ratio must not exceed maximum continuous torque of gearbox

Max Intermittent Torque = 2 x Max Cont. Torque

Momentary Stall Torque = 5 x Max Cont. Torque

Minimum Gearbox Efficiency = Torque Multiplier Ratio divided by Speed Reduction Ratio x 100

*When You Order

Each of the basic motor armature windings (see chart, next page) can be used with any of the gear ratios listed above. To order, state the gear train standard part number prefix, plus a motor armature winding dash number. EXAMPLE: 102A152-8 is a 3.81:1 BD gearmotor with a "-8" armature winding, 12 volts, 6,700 rpm, 3.5 oz. in. torque, etc.

Basic Motor Data

Type BD

VOLTAGE (VDC)	SPEED no load (rpm)	TORQUE		CURRENT			CONSTANTS		ARMATURE WINDING DASH NUMBER*
		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)	
6	10,000-12,000	2.3	19.0	1.40	4.6	35.00	.67	.18	-3
6	8,000-9,500	3.2	15.0	1.10	4.6	22.00	.86	.29	-4
12	12,500-14,500	1.8	24.0	.85	2.3	27.00	1.10	.46	-5
12	10,000-12,000	2.4	19.0	.70	2.3	17.00	1.39	.74	-6
12	8,000-9,500	3.2	15.0	.55	2.3	11.00	1.74	1.13	-7
12	6,200-7,300	3.5	11.0	.44	2.5	7.00	2.22	1.88	-8
27	11,000-13,000	2.0	22.0	.34	1.0	9.80	2.79	3.04	-9
27	9,000-10,500	2.8	17.0	.27	1.0	6.40	3.47	4.82	-10
27	7,000-8,500	3.6	14.0	.23	1.0	3.90	4.35	7.58	-11
50	10,500-12,500	2.1	20.0	.18	.5	4.60	5.45	12.20	-12
50	8,000-9,500	2.8	16.0	.15	.5	2.90	6.85	19.10	-13
50	6,500-8,000	3.7	13.0	.11	.5	1.80	8.64	30.80	-14
50	5,000-6,500	3.5	10.0	.09	.4	1.20	10.87	48.30	-15
115	13,000-15,500	1.6	18.0	.09	.3	2.30	9.95	56.30	-16
115	11,000-13,000	2.2	14.0	.08	.3	1.50	12.17	87.00	-17
115	9,000-10,500	2.8	11.0	.07	.3	.95	14.97	135.00	-18
115	7,000-8,500	3.6	9.0	.06	.3	.61	18.79	207.00	-19
115	6,000-7,000	2.9	7.0	.05	.2	.40	22.46	332.00	-20
115	4,500-5,500	2.7	6.5	.05	.2	.26	27.29	507.00	-21

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

Type BL

VOLTAGE (VDC)	SPEED no load (rpm)	TORQUE		CURRENT			CONSTANTS		ARMATURE WINDING DASH NUMBER*
		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)	
6	8,500-10,500	4.0	29.0	1.30	6.50	45.00	.80	.14	-2
6	6,500-8,000	5.0	23.0	1.00	6.50	28.00	1.01	.24	-3
12	10,000-12,500	3.3	37.0	.77	3.50	36.00	1.30	.39	-4
12	8,500-10,500	4.4	29.0	.61	3.50	22.00	1.66	.62	-5
12	6,500-8,000	5.0	23.0	.49	3.50	14.00	2.10	1.00	-6
12	5,100-6,200	5.5	18.0	.40	3.00	9.00	2.63	1.50	-7
27	9,200-11,000	3.7	33.0	.31	1.40	12.00	3.35	2.50	-8
27	7,000-9,000	5.0	27.0	.25	1.40	8.00	4.21	4.10	-9
27	5,500-7,000	6.0	21.0	.20	1.40	5.20	5.24	6.40	-10
50	8,500-10,500	3.8	31.0	.17	.72	5.90	6.57	10.10	-11
50	6,500-8,000	5.0	25.0	.13	.74	3.70	8.23	16.00	-12
50	5,500-7,000	6.5	20.0	.11	.73	2.40	10.34	25.00	-13
50	4,500-5,500	7.5	16.0	.09	.66	1.50	13.05	41.00	-14
50	3,500-4,500	6.0	12.5	.06	.43	.94	16.41	65.00	-15
115	8,500-10,500	4.2	22.0	.08	.34	1.90	15.02	75.00	-16
115	7,000-9,000	5.0	17.0	.07	.40	1.20	18.38	116.00	-17
115	5,500-7,000	5.0	14.0	.05	.28	.77	22.60	180.00	-18
115	4,500-5,500	4.2	11.0	.04	.19	.50	28.37	267.00	-19
115	4,000-5,000	3.5	8.8	.04	.14	.33	33.91	420.00	-20
115	3,000-4,000	2.9	8.1	.03	.10	.21	41.21	645.00	-21

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