

Specification of Printed Armature DC Servo Motors

Performance figures

MOTOR RATINGS (1&2)	SYMBOL	UNIT	B9 M4	B12 M4	B12 M4H	B9M 4T*	B12M 4T*	B12M4 HT*	BR13M ACH	BR17M ACH	BR19M ACH	BR19M AHR	B23M ACH	BR24M ACH	BR27M ACH
Rated Torque	To	Nom	34	85	112	30	80	97	120	190	320	320	700	960	1432
Rated Speed	N	RPM	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Rated Output (3)	W	Watts	106	268	350	94	250	305	380	600	1000	1000	2200	3000	4500
Rated Voltage	V	Volts	24.1	43.4	63.5	22.9	40.4	56.5	65	105	83	164	172	140	150
Rated Current	I	Amps	8.71	8.8	8	8.63	8.7	8	8	7.3	14.4	7.2	14.8	25	32.8
Max. Current at very low speed	ICC	Amps	6.81	8.13	8.1	6.81	8.13	8.1	6.5	7.1	16.5	8.5	11	20	37.5
Peak Torque (4)	Tp	Nom	306	861	1380	283	843	1208	850	1400	2440	2440	5000	8400	11500
Peak Current (4)	Ip	Amps	72	84.5	84.5	72	84.5	84.5	50	48.7	101.4	50.1	100	200	251
Max speed with No external load	Nmax	RPM	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	4000	4000
MOTOR Constants															
Back EMF Constant	Ke	Volts/K RPM	4.85	11.55	15.82	4.5	10.6	13.82	16.5	30	25	51	53	43	48.3
Torque Constant	Kt	Ncm/Amps	4.72	11.25	15.01	4.37	10.39	13.55	15.8	23.4	23.9	48.8	50.6	41.2	46.1
Damping Constant	Kd	Ncm/K RPM	0.94	2.2	3.8	0.94	2.2	3.8	1.5	8	8	8	13	12.5	20

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Friction Torque	Tf	Ncm	3.13	4.3	5	3.2	4.3	5	2.6	10	10	10	12	15	20
Terminal Resistance	Rt	Ohms	0.85	0.75	0.75	0.85	0.75	0.75	1.5	1.6	0.46	1.6	0.9	0.285	0.18
Armature Inductance	La	Micro-H	<100	<100	<100	<100	<100	<100	<80	<400	<100	<400	<250	<100	<100
Moment of Inertia	Jm	gm-cm ²	395	1342	1480	586	1837	1910	2350	10000	10000	10000	23000	32000	74000
Mech. Time Constant	Tm	Milli-sec	11.97	6.68	2.88	20.52	10.84	4.82	12	6.5	7.4	6.5	8	5.1	6
Ele. Time Constant	Te	Micro-sec	<150	<160	<160	<150	<160	<160	<55	<250	<217.4	<250	<240	<350	<555.6
Motor Diameter	D	mm	115	145	145	115	145	145	170	200	226	226	270	290	300
Motor Length (Excl Shaft)	L	mm	55	55	70	57	57	72	126	120	137	137	147	168	375
Weight	Wt.	Kg	2.3	3.6	5	2.3	3.6	5	5.5	12	12	12	21	25	38
Tachogenerator Characteristics			Units		Tach o	Tacho	Tacho	B12T	B9T	Peak acceleration with load can be calculated as					
Output Voltage			Volts/100 RPM		2.25	5.3	6.4	6	3	PEAK TORQUE-LOAD FRICTION : JM + REFLECTED LOAD INERTIA					
Ripple Content (Max.)			%		3.5	3.5	3.5	3	3	The Operating current can be calculated as					
Linearity of Output Voltage (Ref. 3600 RPM)			%		0.11	0.11	0.11	0.05	0.05	The Operating Voltage can be calculated as					
By directional Tolerance			%		1	1	1.5	1.5	1.5	: $(\text{SHAFT TORQUE SPEED} + \text{Tf} + \text{Kd} \times \frac{\text{Speed}}{1000}) / \text{Kt}$					
Temp. Coe. of Voltage			% per Deg. C		-0.02	-0.02	-0.02	0.02	0.02						
Minimum Load Resistance Recommended			Ohms		370	494	494	1000	1000	: $\text{Ke} \times \frac{\text{Speed}}{1000} + \text{Rt} \times \text{OP. Current}$					