



Shown with optional assemblies.

EC044A Series

The EC044A Series Brushless DC Motor is a medium torque density 4 pole model designed as an economical upgrade to brushed motors. The EC044A is an excellent choice for both power transmission and precision motion control applications. It is offered in 3 motor lengths with continuous torque from 0.043 – 0.081 Nm in a 44 mm diameter.

EC Instrument Grade Motors

For applications that require uniform motion control at all speeds. Capable of high acceleration.

Motor Characteristics

Motor Data	Units	Part No.			
		EC044A-1	EC044A-2	EC044A-3	
Max DC Terminal Voltage	V_T	V			
Max Speed (Mechanical)	ω_{MAX}	rpm			
Continuous Stall Torque ¹	T_{CS}	Nm	0.043	0.065	0.081
		oz-in	6.0	9.2	11
Peak Torque (Maximum) ¹	T_{pk}	Nm	0.20	0.36	0.45
		oz-in	29	51	64
Coulomb Friction Torque	T_f	Nm	0.0028	0.0028	0.0028
		oz-in	0.40	0.40	0.40
Viscous Damping Factor	D	Nm/(rad/s)	2.0E-06	4.0E-06	5.4E-06
		oz-in/krpm	0.030	0.060	0.080
Thermal Time Constant	τ_{th}	min	5.4	9.0	13
Thermal Resistance	R_{th}	°C/W	10	8.5	7.5
Max. Winding Temperature	θ_{MAX}	°C	125	125	125
Rotor Inertia	J_r	kg-m ²	2.1E-06	3.0E-06	4.0E-06
		oz-in-s ²	3.0E-04	4.2E-04	5.6E-04
Motor Weight	W_m	g	260	350	430
		oz	9.2	12	15

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.

Benefits

- Speeds up to 15,000 RPM possible
- DC bus voltage up to 48 VDC
- Metric mounting
- Eight standard windings per stack, special windings available

Optional Assemblies

- Encoders: E30C/D, H Type
- Gearboxes: PLG42S, G51A, PLG52
- Brake: B30A
- Programmable Drives: PBL4850E, BGE3004A, BGE6015A

Dimensional Drawings: EC044A-1 • EC044A-2 • EC044A-3

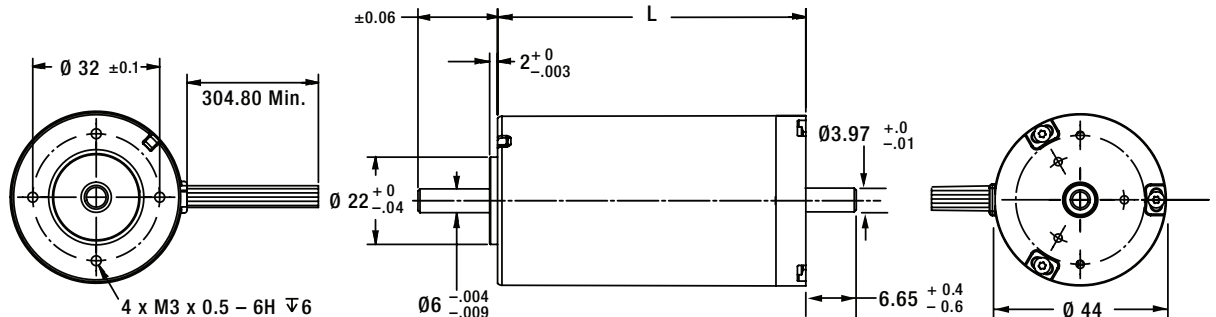
Dimensions = metric (mm)

L = Lengths Available

EC044A-1 = 52.3 mm

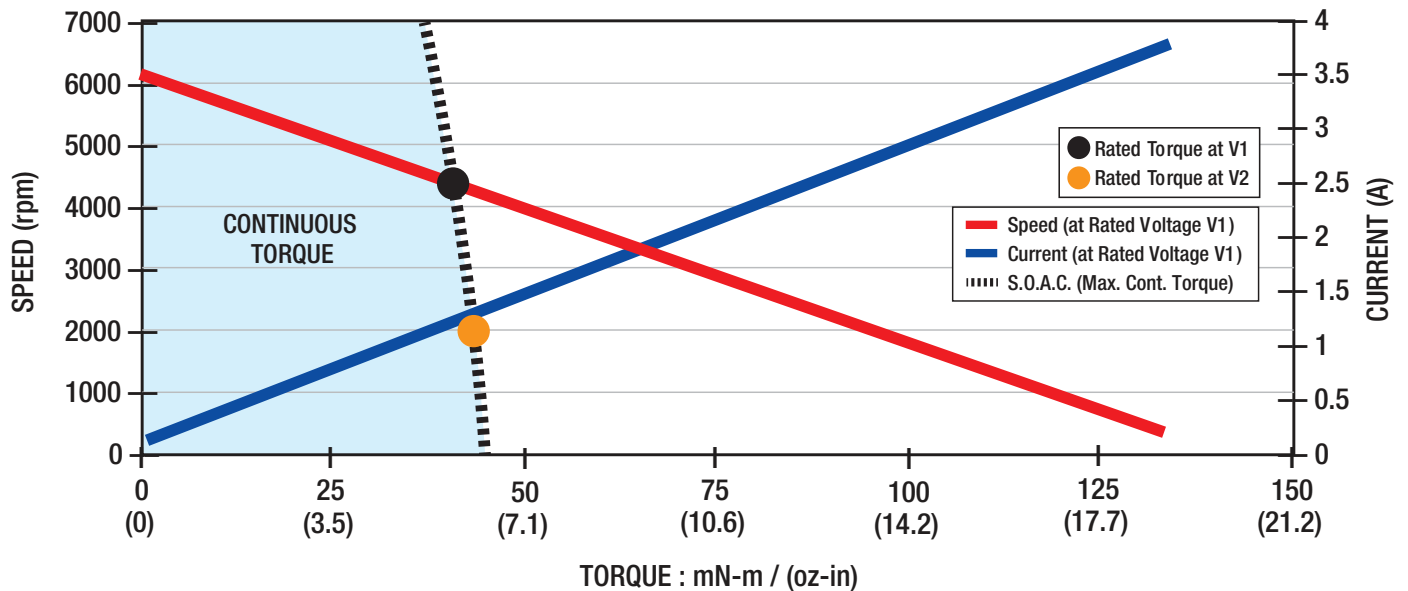
EC044A-2 = 65.0 mm

EC044A-3 = 77.7 mm



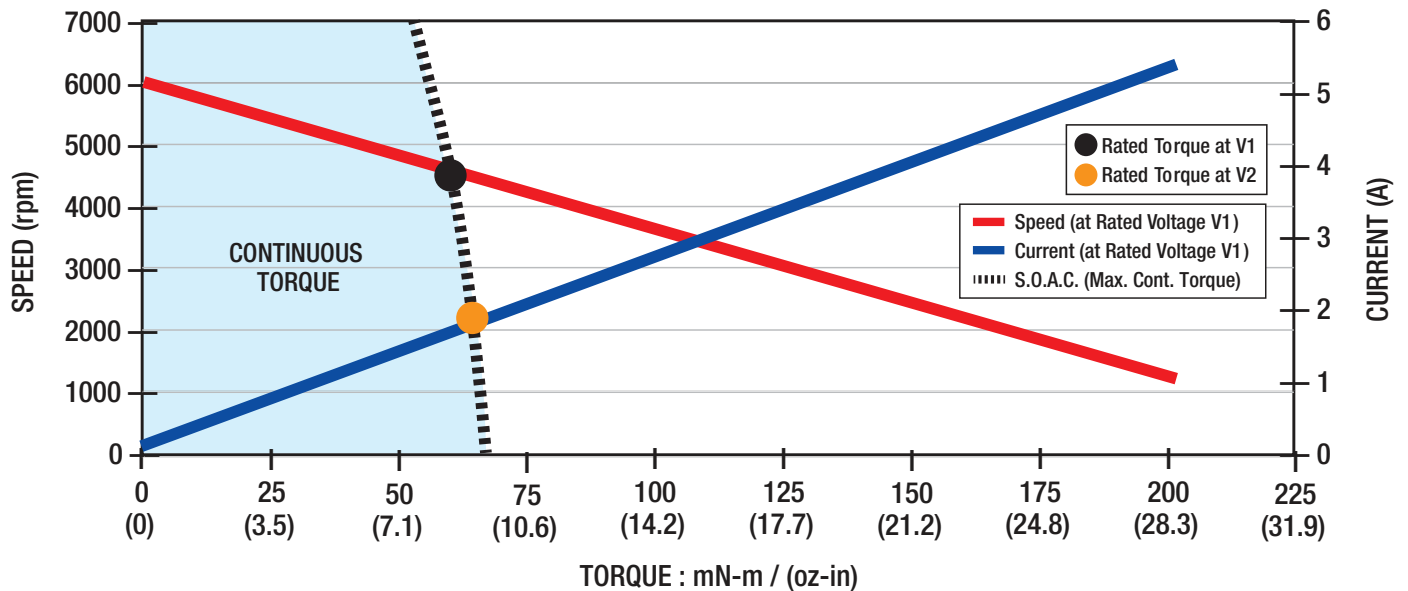
Motor Data		Units								
Rated Voltage V1	V_r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.2	38.1
Rated Torque ¹ •	T_r	Nm	0.039	0.041	0.041	0.041	0.041	0.041	0.041	0.041
		oz-in	5.6	5.8	5.8	5.8	5.8	5.8	5.8	5.7
Rated Speed ¹	ω_r	rpm	4240	4060	4130	4190	4190	4250	4140	4240
Rated Current ¹	I_r	A	3.7	2.9	2.3	1.9	1.5	1.2	0.93	0.74
Rated Power ¹	P_r	W	17	17	18	18	18	18	18	18
No Load Speed	ω_{nl}	rpm	5490	5280	5340	5370	5380	5430	5340	5420
No Load Current	I_{nl}	A	0.31	0.24	0.19	0.15	0.12	0.097	0.075	0.061
Rated Voltage V2	V_r	V	4.78	6.00	7.58	9.55	12.0	15.2	19.1	24.0
Rated Torque ¹ •	T_r	Nm	0.042	0.043	0.043	0.044	0.043	0.044	0.044	0.043
		oz-in	5.9	6.2	6.1	6.2	6.1	6.2	6.2	6.1
Rated Speed ¹	ω_r	rpm	1880	1780	1850	1880	1880	1940	1870	1910
Rated Current ¹	I_r	A	3.9	3.1	2.5	2.0	1.6	1.3	0.99	0.78
Rated Power ¹	P_r	W	8.2	8.1	8.4	8.6	8.5	8.9	8.6	8.7
No Load Speed	ω_{nl}	rpm	3440	3290	3350	3350	3350	3420	3350	3390
No Load Current	I_{nl}	A	0.28	0.21	0.17	0.14	0.11	0.086	0.067	0.054
Motor Constant	K_M	Nm/ \sqrt{W}	0.019	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		oz-in/ \sqrt{W}	2.7	2.8	2.8	2.9	2.8	2.8	2.9	2.8
Torque Constant	K_T	Nm/A	0.0129	0.0169	0.0210	0.0265	0.0332	0.0413	0.0529	0.0658
		oz-in/A	1.83	2.39	2.98	3.75	4.71	5.86	7.49	9.32
Voltage Constant	K_E	V/(rad/s)	0.0129	0.0169	0.0210	0.0265	0.0332	0.0413	0.0529	0.0658
		V/krpm	1.35	1.77	2.20	2.77	3.48	4.33	5.54	6.89
Terminal Resistance	R_{mt}	Ω	0.450	0.720	1.11	1.73	2.75	4.24	6.90	10.8
Inductance	L	mH	0.31	0.54	0.83	1.3	2.1	3.2	5.2	8.1
Peak Current	I_{pk}	A	17	13	11	8.8	6.9	5.7	4.4	3.5
Electrical Time Constant	τ_e	ms	0.69	0.75	0.75	0.76	0.75	0.76	0.76	0.75
Mechanical Time Constant	τ_m	ms	5.7	5.3	5.3	5.2	5.3	5.3	5.2	5.3

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units								
Rated Voltage V1	V_r	V	12.0	15.2	19.1	24.0	30.2	38.1	48.0	48.0
Rated Torque ¹ •	T_r	Nm	0.059	0.061	0.061	0.061	0.061	0.060	0.061	0.063
		oz-in	8.3	8.7	8.6	8.6	8.7	8.6	8.6	8.9
Rated Speed ¹	ω_r	rpm	4550	4360	4430	4440	4430	4530	4440	3220
Rated Current ¹	I_r	A	3.4	2.7	2.1	1.7	1.4	1.1	0.85	0.71
Rated Power ¹	P_r	W	28	28	28	28	28	29	28	21
No Load Speed	ω_{nl}	rpm	5470	5270	5340	5330	5340	5410	5340	4280
No Load Current	I_{nl}	A	0.25	0.19	0.16	0.13	0.096	0.078	0.061	0.045
Rated Voltage V2	V_r	V	7.58	9.55	12.0	15.2	19.1	24.0	38.1	48.0
Rated Torque ¹ •	T_r	Nm	0.064	0.066	0.065	0.066	0.066	0.065	0.064	0.063
		oz-in	9.0	9.3	9.3	9.3	9.3	9.3	9.0	8.9
Rated Speed ¹	ω_r	rpm	2220	2100	2140	2180	2160	2220	3160	3220
Rated Current ¹	I_r	A	3.6	2.8	2.3	1.8	1.4	1.2	0.89	0.71
Rated Power ¹	P_r	W	15	15	15	15	15	15	21	21
No Load Speed	ω_{nl}	rpm	3440	3300	3340	3370	3360	3400	4230	4280
No Load Current	I_{nl}	A	0.21	0.16	0.13	0.11	0.080	0.065	0.055	0.045
Motor Constant	K_M	Nm/ \sqrt{W}	0.026	0.027	0.027	0.027	0.027	0.027	0.027	0.027
		oz-in/ \sqrt{W}	3.7	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Torque Constant	K_T	Nm/A	0.0206	0.0271	0.0336	0.0423	0.0532	0.0662	0.0846	0.105
		oz-in/A	2.92	3.84	4.76	5.99	7.53	9.37	12.0	14.9
Voltage Constant	K_E	V/(rad/s)	0.0206	0.0271	0.0336	0.0423	0.0532	0.0662	0.0846	0.105
		V/krpm	2.16	2.84	3.52	4.43	5.57	6.93	8.86	11.0
Terminal Resistance	R_{mt}	Ω	0.629	1.02	1.59	2.49	3.96	6.10	9.95	15.6
Inductance	L	mH	0.50	0.86	1.3	2.1	3.3	5.1	8.4	13
Peak Current	I_{pk}	A	19	15	12	9.6	7.6	6.2	4.8	3.1
Electrical Time Constant	τ_e	ms	0.79	0.84	0.83	0.84	0.83	0.84	0.84	0.83
Mechanical Time Constant	τ_m	ms	4.4	4.1	4.2	4.1	4.2	4.1	4.1	4.2

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units								
Rated Voltage V1	V_r	V	15.2	19.1	24.0	30.2	38.1	48.0	48.0	48.0
Rated Torque ¹ •	T_r	Nm	0.073	0.075	0.075	0.075	0.075	0.075	0.079	0.081
		oz-in	10	11	11	11	11	11	11	11
Rated Speed ¹	ω_r	rpm	4260	4040	4110	4110	4120	4200	2940	2060
Rated Current ¹	I_r	A	3.0	2.4	1.9	1.5	1.2	0.97	0.80	0.65
Rated Power ¹	P_r	W	32	32	32	32	32	33	24	17
No Load Speed	ω_{nl}	rpm	5050	4830	4890	4890	4910	4980	3880	3120
No Load Current	I_{nl}	A	0.20	0.15	0.13	0.097	0.078	0.062	0.044	0.032
Rated Voltage V2	V_r	V	9.52	12.0	15.2	19.1	24.0	30.2	38.1	38.1
Rated Torque ¹ •	T_r	Nm	0.079	0.081	0.080	0.081	0.081	0.081	0.081	0.081
		oz-in	11	11	11	11	11	11	12	12
Rated Speed ¹	ω_r	rpm	2080	1970	2040	2040	2030	2070	2020	1320
Rated Current ¹	I_r	A	3.2	2.5	2.0	1.6	1.3	1.0	0.81	0.66
Rated Power ¹	P_r	W	17	17	17	17	17	18	17	11
No Load Speed	ω_{nl}	rpm	3150	3030	3090	3090	3090	3120	3080	2470
No Load Current	I_{nl}	A	0.17	0.13	0.099	0.079	0.063	0.051	0.040	0.030
Motor Constant	K_M	Nm/ \sqrt{W}	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
		oz-in/ \sqrt{W}	4.3	4.5	4.4	4.5	4.4	4.5	4.5	4.4
Torque Constant	K_T	Nm/A	0.0284	0.0372	0.0462	0.0582	0.0731	0.0909	0.116	0.145
		oz-in/A	4.02	5.27	6.55	8.24	10.3	12.9	16.5	20.5
Voltage Constant	K_E	V/(rad/s)	0.0284	0.0372	0.0462	0.0582	0.0731	0.0909	0.116	0.145
		V/krpm	2.97	3.90	4.84	6.09	7.65	9.52	12.2	15.1
Terminal Resistance	R_{mt}	Ω	0.860	1.40	2.18	3.42	5.44	8.40	13.7	21.5
Inductance	L	mH	0.68	1.2	1.8	2.9	4.5	7.0	11	18
Peak Current	I_{pk}	A	18	14	11	8.8	7.0	5.7	3.5	2.2
Electrical Time Constant	τ_e	ms	0.79	0.84	0.83	0.84	0.83	0.83	0.83	0.82
Mechanical Time Constant	τ_m	ms	4.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0

¹Recorded at maximum winding temperature at 25°C ambient and without heatsink.

