

DC054B Series

The DC054B Series Brush Commutated DC Motor is a 54 mm diameter unit offered in 7 lengths with continuous output torques of 0.071 to 0.35 Nm.



Shown with optional assemblies.

DC Brush Commutated Motors For applications that require reliability and performance with basic control. Yields high efficiencies by consuming less electricity.

Benefits

- Speeds up to 6,00 RPM possible
- DC bus voltage up to 80 VDC
- Eight standard windings, special windings available
- 2 pole stator with ceramic magnets
- 7 slot skewed armature cogging reduction
- Sintered bronze bearings, ball bearings available
- Copper graphite brushes, RFI suppression available

Optional Assemblies

- Encoder: E30C/D, Q Type
- Gearboxes: G40A, PLG42S, G51A, PLG52
- Drives: BGE6060A, PBL4850E**

Motor Characteristics

Motor Data	Units	Part No.							
		DC054B-1	DC054B-2	DC054B-3	DC054B-4	DC054B-5	DC054B-6	DC054B-7	
Max DC Terminal Voltage	V _T	V							
Max Speed (Mechanical)	ω _{MAX}	6000			5000				
Continuous Stall Torque ¹	T _{CS}	Nm	0.071	0.099	0.15	0.18	0.22	0.26	0.35
		oz-in	10	14	21	26	31	37	50
Peak Torque (Maximum) ¹	T _{PK}	Nm	0.39	0.67	1.0	1.3	1.4	1.8	2.6
		oz-in	55	95	140	180	200	260	370
Coulomb Friction Torque	T _f	Nm	0.0085	0.0085	0.011	0.011	0.014	0.014	0.016
		oz-in	1.2	1.2	1.6	1.6	2.0	2.0	2.2
Viscous Damping Factor	D	Nm/(rad/s)	1.1E-05	1.1E-05	1.2E-05	1.2E-05	1.3E-05	1.3E-05	1.7E-05
		oz-in/krpm	0.17	0.17	0.18	0.18	0.19	0.19	0.25
Thermal Time Constant	τ _{th}	min	22	24	26	29	29	34	32
Thermal Resistance	R _{th}	°C/W	9.9	9.0	8.1	7.7	7.3	6.8	5.0
Max. Winding Temperature	Θ _{MAX}	°C	155	155	155	155	155	155	155
Rotor Inertia	J _r	kg-m ²	1.1E-05	1.6E-05	2.1E-05	2.6E-05	3.1E-05	3.7E-05	4.7E-05
		oz-in-s ²	0.0016	0.0023	0.0030	0.0037	0.0044	0.0052	0.0067
Motor Weight	W _m	g	590	740	880	1000	1100	1300	1500
		oz	21	26	31	35	40	45	55

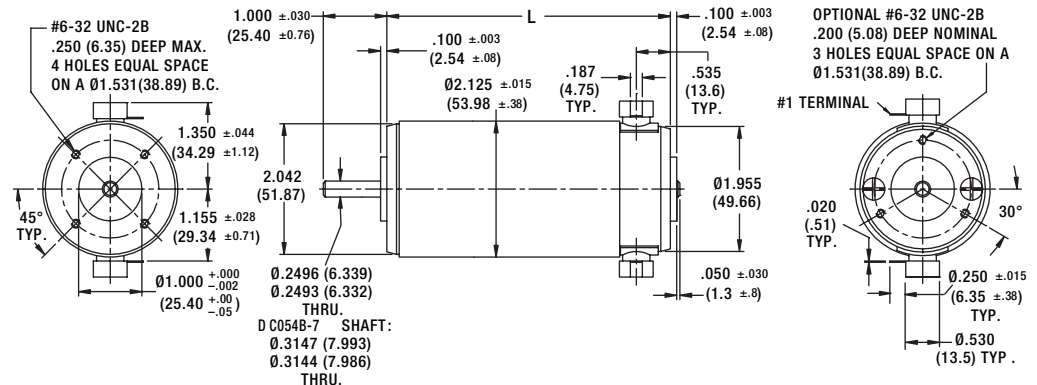
¹Recorded at maximum winding temperature at 25°C ambient and without heatsink. **For PBL4850E to operate a brush motor, an encoder is required.

Dimensional Drawings: DC054B-1 • DC054B-2 • DC054B-3 • DC054B-4 • DC054B-5 • DC054B-6 • DC054B-7

Dimensions = Inches (mm)

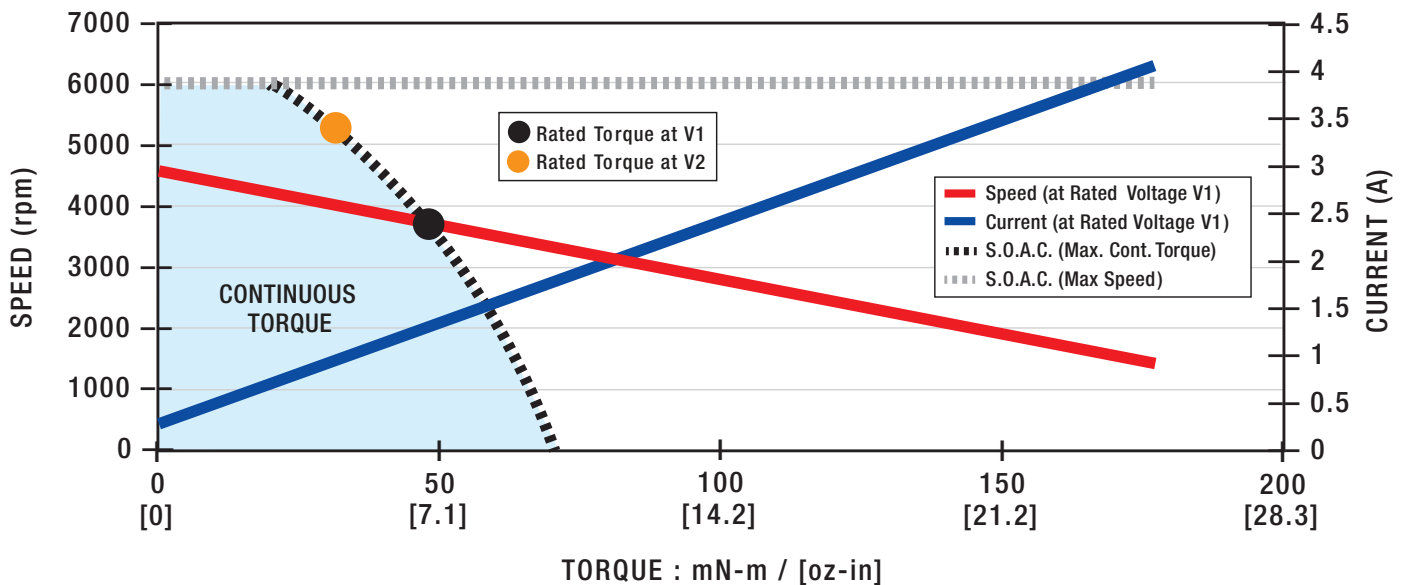
L = Lengths Available

- DC054B-1 = 2.953 (75.01) Max.
- DC054B-2 = 3.203 (81.36) Max.
- DC054B-3 = 3.703 (94.06) Max.
- DC054B-4 = 4.078 (103.6) Max.
- DC054B-5 = 4.453 (113.1) Max.
- DC054B-6 = 4.953 (125.8) Max.
- DC054B-7 = 5.703 (144.9) Max.



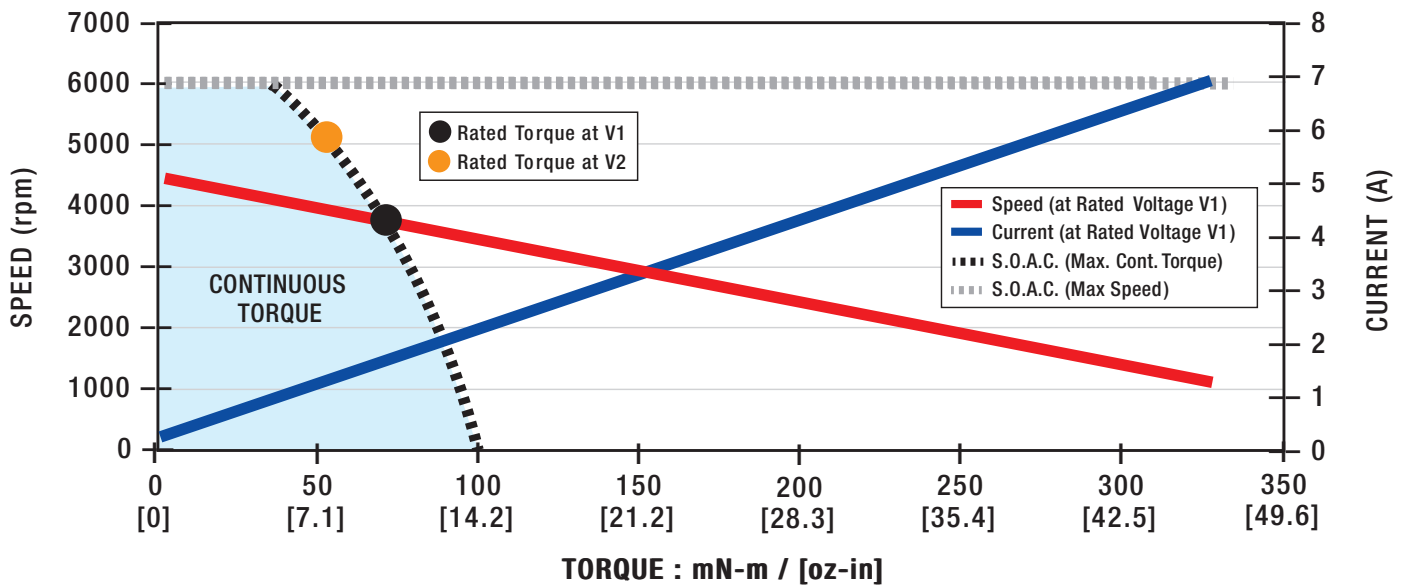
Motor Data		Units								
Rated Voltage V1	V_r	V	12.0	15.2	19.1	24.0	30.3	38.2	48.0	60.6
Rated Torque ¹ •	T_r	Nm	0.049	0.048	0.048	0.048	0.048	0.047	0.048	0.048
		oz-in	6.9	6.8	6.8	6.8	6.7	6.7	6.7	6.7
Rated Speed ¹	ω_r	rpm	3680	3780	3750	3740	3720	3770	3750	3720
Rated Current ¹	I_r	A	2.7	2.1	1.7	1.3	1.0	0.83	0.65	0.51
Rated Power ¹	P_r	W	19	19	19	19	19	19	19	19
No Load Speed	ω_{nl}	rpm	4140	4200	4170	4150	4120	4170	4150	4120
No Load Current	I_{nl}	A	0.52	0.42	0.33	0.26	0.21	0.17	0.13	0.11
Rated Voltage V2	V_r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4
Rated Torque ¹ •	T_r	Nm	0.033	0.031	0.031	0.031	0.031	0.031	0.031	0.031
		oz-in	4.7	4.4	4.4	4.4	4.4	4.3	4.3	4.3
Rated Speed ¹	ω_r	rpm	5250	5320	5280	5290	5250	5300	5300	5250
Rated Current ¹	I_r	A	2.1	1.6	1.3	0.99	0.77	0.62	0.49	0.39
Rated Power ¹	P_r	W	18	17	17	17	17	17	17	17
No Load Speed	ω_{nl}	rpm	5270	5300	5250	5260	5210	5260	5260	5210
No Load Current	I_{nl}	A	0.57	0.46	0.36	0.29	0.23	0.18	0.15	0.12
Motor Constant	K_M	Nm/ \sqrt{W}	0.031	0.031	0.031	0.031	0.032	0.032	0.032	0.032
		oz-in/ \sqrt{W}	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5
Torque Constant	K_T	Nm/A	0.0263	0.0328	0.0416	0.0525	0.0668	0.0832	0.105	0.134
		oz-in/A	3.72	4.65	5.90	7.44	9.47	11.8	14.9	18.9
Voltage Constant	K_E	V/(rad/s)	0.0263	0.0328	0.0416	0.0525	0.0668	0.0832	0.105	0.134
		V/krpm	2.75	3.44	4.36	5.50	7.00	8.71	11.0	14.0
Terminal Resistance	R_{mt}	Ω	0.720	1.11	1.76	2.79	4.45	6.98	11.1	17.8
Inductance	L	mH	0.63	0.99	1.6	2.5	4.1	6.4	10	16
Peak Current	I_{pk}	A	17	14	11	8.6	6.8	5.5	4.3	3.4
Electrical Time Constant	τ_e	ms	0.88	0.89	0.90	0.91	0.92	0.91	0.92	0.92
Mechanical Time Constant	τ_m	ms	12	12	11	11	11	11	11	11

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



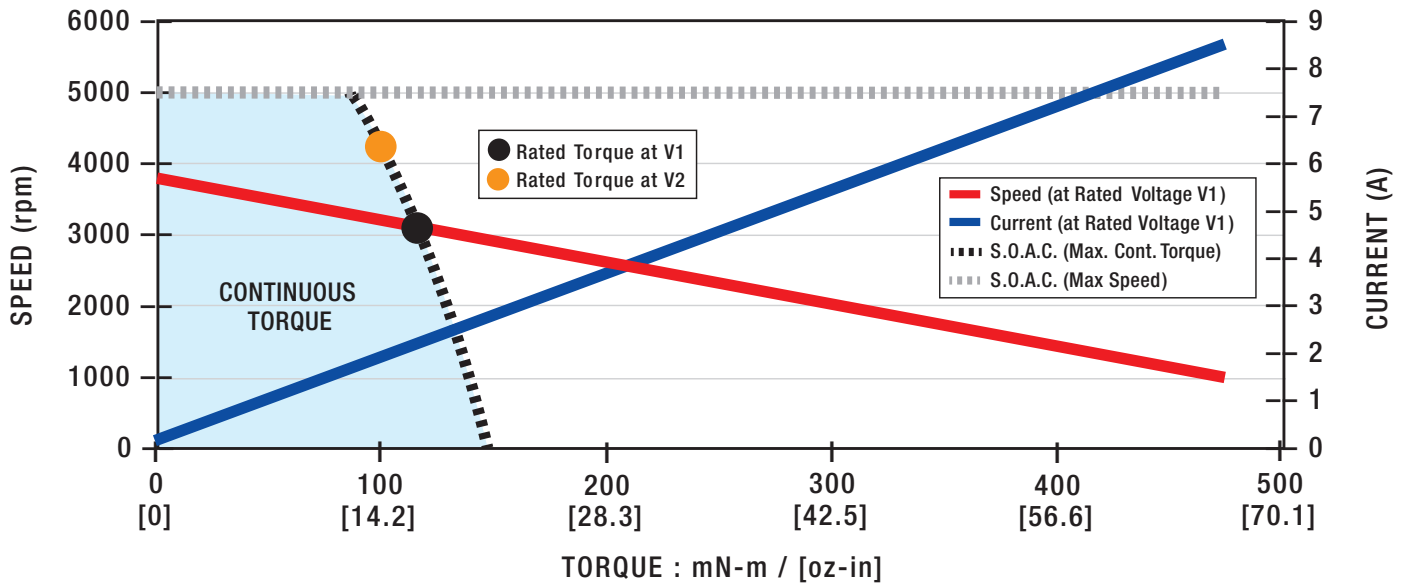
Motor Data		Units									
Rated Voltage V1	V _r	V	12.0	15.2	19.1	24.0	30.3	38.2	48.0	60.6	
Rated Torque ¹ •	T _r	Nm	0.072	0.071	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		oz-in	10	10	9.9	9.9	9.9	9.9	9.9	9.9	9.8
Rated Speed ¹	ω _r	rpm	3720	3740	3790	3770	3780	3750	3790	3780	
Rated Current ¹	I _r	A	3.5	2.7	2.2	1.7	1.4	1.1	0.86	0.67	
Rated Power ¹	P _r	W	28	28	28	28	28	27	28	28	
No Load Speed	ω _{nl}	rpm	4010	4010	4030	4010	4010	3970	4020	4000	
No Load Current	I _{nl}	A	0.49	0.39	0.31	0.25	0.20	0.16	0.13	0.096	
Rated Voltage V2	V _r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4	
Rated Torque ¹ •	T _r	Nm	0.054	0.054	0.052	0.052	0.051	0.052	0.051	0.051	
		oz-in	7.7	7.6	7.4	7.3	7.3	7.3	7.2	7.2	
Rated Speed ¹	ω _r	rpm	5130	5100	5160	5160	5160	5100	5190	5160	
Rated Current ¹	I _r	A	2.8	2.2	1.7	1.4	1.1	0.85	0.68	0.53	
Rated Power ¹	P _r	W	29	29	28	28	28	28	28	27	
No Load Speed	ω _{nl}	rpm	5090	5050	5080	5070	5070	5000	5090	5050	
No Load Current	I _{nl}	A	0.54	0.42	0.34	0.27	0.21	0.17	0.14	0.11	
Motor Constant	K _M	Nm/√W	0.041	0.041	0.042	0.042	0.042	0.042	0.042	0.042	
		oz-in/√W	5.8	5.9	5.9	5.9	5.9	6.0	6.0	6.0	
Torque Constant	K _T	Nm/A	0.0275	0.0349	0.0435	0.0551	0.0695	0.0884	0.110	0.139	
		oz-in/A	3.89	4.94	6.17	7.80	9.84	12.5	15.6	19.7	
Voltage Constant	K _E	V/(rad/s)	0.0275	0.0349	0.0435	0.0551	0.0695	0.0884	0.110	0.139	
		V/krpm	2.88	3.65	4.56	5.77	7.28	9.26	11.5	14.6	
Terminal Resistance	R _{mt}	Ω	0.450	0.710	1.09	1.73	2.74	4.37	6.85	10.9	
Inductance	L	mH	0.63	1.0	1.6	2.5	4.1	6.6	10	16	
Peak Current	I _{pk}	A	27	21	18	14	11	8.7	7.0	5.6	
Electrical Time Constant	τ _e	ms	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	
Mechanical Time Constant	τ _m	ms	9.7	9.5	9.3	9.3	9.2	9.1	9.2	9.1	

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



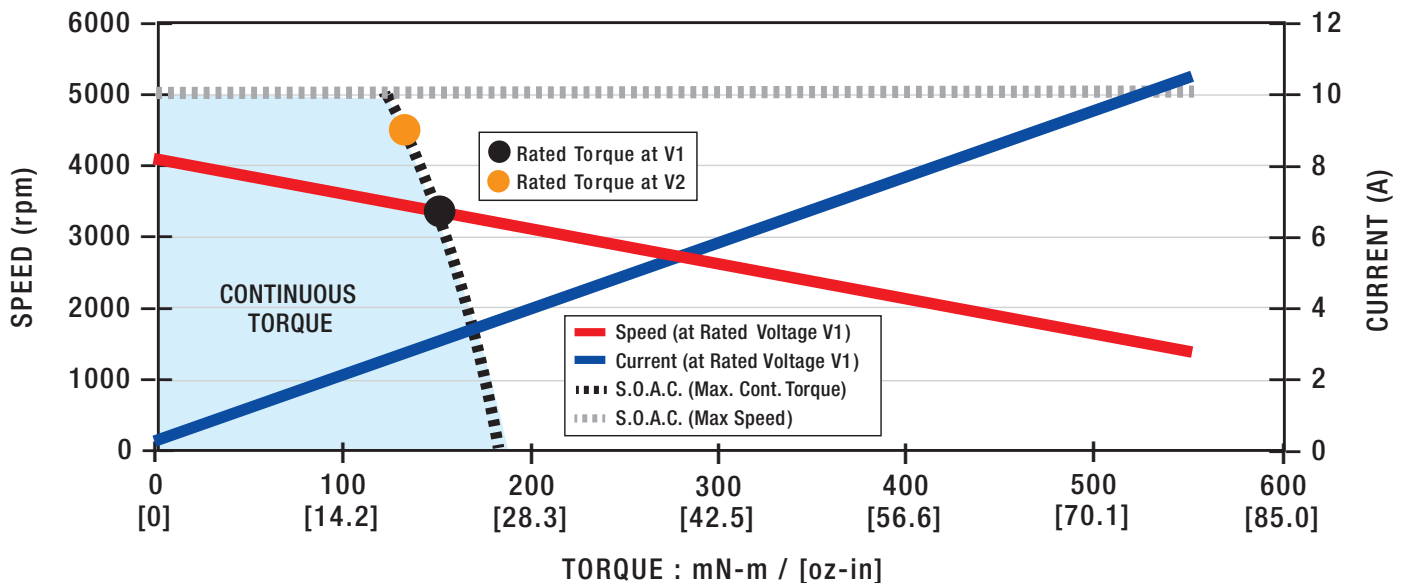
Motor Data		Units								
Rated Voltage V1	V_r	V	12.0	15.2	19.1	24.0	30.3	38.2	48.0	60.6
Rated Torque ¹ •	T_r	Nm	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
		oz-in	17	17	17	17	17	16	17	17
Rated Speed ¹	ω_r	rpm	3050	3100	3090	3120	3120	3110	3090	3140
Rated Current ¹	I_r	A	4.7	3.7	2.9	2.3	1.8	1.4	1.1	0.91
Rated Power ¹	P_r	W	38	38	38	38	38	38	38	38
No Load Speed	ω_{nl}	rpm	3390	3390	3370	3390	3380	3360	3340	3390
No Load Current	I_{nl}	A	0.48	0.38	0.30	0.24	0.19	0.15	0.12	0.095
Rated Voltage V2	V_r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4
Rated Torque ¹ •	T_r	Nm	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
		oz-in	15	15	14	14	14	14	14	14
Rated Speed ¹	ω_r	rpm	4180	4190	4170	4240	4230	4190	4190	4240
Rated Current ¹	I_r	A	4.2	3.3	2.6	2.0	1.6	1.3	1.0	0.80
Rated Power ¹	P_r	W	46	45	45	45	44	44	44	44
No Load Speed	ω_{nl}	rpm	4300	4270	4240	4280	4270	4230	4220	4280
No Load Current	I_{nl}	A	0.52	0.41	0.32	0.26	0.21	0.16	0.13	0.11
Motor Constant	K_M	Nm/ \sqrt{W}	0.054	0.055	0.055	0.056	0.056	0.057	0.056	0.056
		oz-in/ \sqrt{W}	7.6	7.8	7.9	7.9	7.9	8.0	8.0	7.9
Torque Constant	K_T	Nm/A	0.0327	0.0413	0.0523	0.0654	0.0828	0.105	0.133	0.165
		oz-in/A	4.62	5.86	7.41	9.26	11.7	14.9	18.8	23.4
Voltage Constant	K_E	V/(rad/s)	0.0327	0.0413	0.0523	0.0654	0.0828	0.105	0.133	0.165
		V/krpm	3.42	4.33	5.48	6.85	8.67	11.0	13.9	17.3
Terminal Resistance	R_{mt}	Ω	0.370	0.570	0.890	1.38	2.19	3.46	5.53	8.68
Inductance	L	mH	0.56	0.91	1.5	2.3	3.6	5.8	9.3	15
Peak Current	I_{pk}	A	32	27	21	17	14	11	8.7	7.0
Electrical Time Constant	τ_e	ms	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.7
Mechanical Time Constant	τ_m	ms	7.3	7.1	6.9	6.8	6.8	6.6	6.6	6.7

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



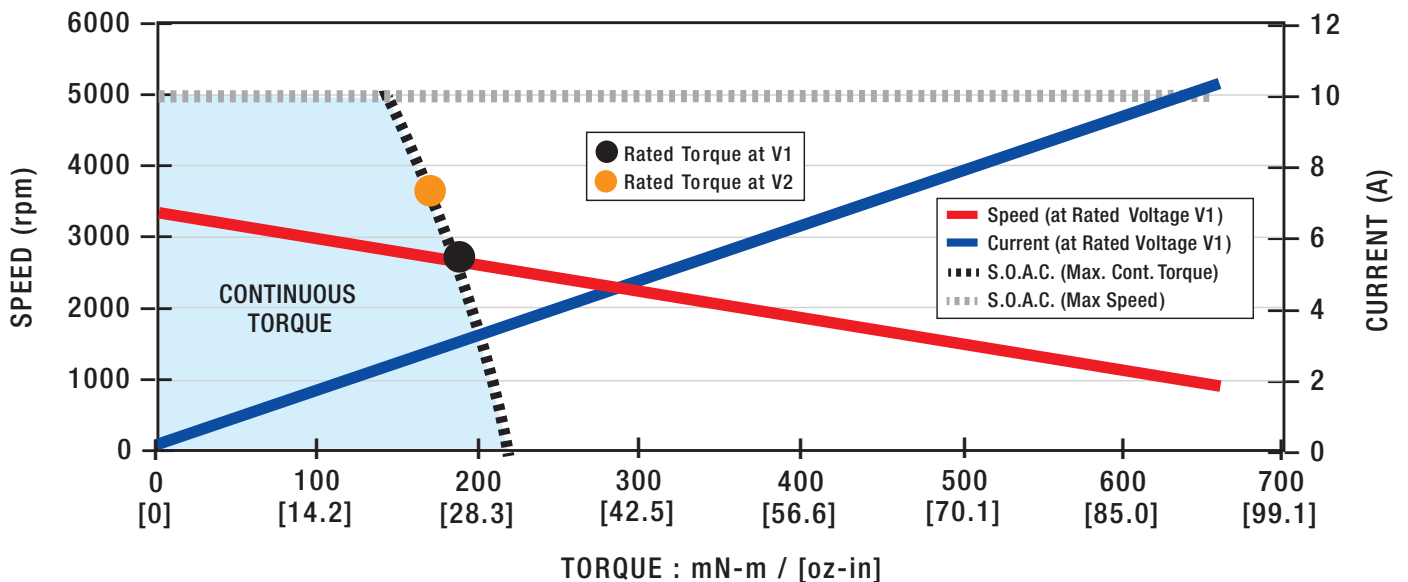
Motor Data		Units								
Rated Voltage V1	V_r	V	12.0	15.2	19.1	24.0	30.3	38.2	48.0	60.6
Rated Torque ¹ •	T_r	Nm	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		oz-in	22	22	21	21	21	21	21	21
Rated Speed ¹	ω_r	rpm	3280	3340	3350	3350	3400	3380	3380	3350
Rated Current ¹	I_r	A	6.3	5.0	3.9	3.1	2.5	1.9	1.5	1.2
Rated Power ¹	P_r	W	53	53	53	53	53	53	53	53
No Load Speed	ω_{nl}	rpm	3630	3670	3650	3630	3660	3630	3640	3600
No Load Current	I_{nl}	A	0.53	0.42	0.33	0.26	0.21	0.17	0.14	0.11
Rated Voltage V2	V_r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4
Rated Torque ¹ •	T_r	Nm	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
		oz-in	19	19	19	19	19	19	19	19
Rated Speed ¹	ω_r	rpm	4470	4500	4500	4520	4570	4520	4550	4510
Rated Current ¹	I_r	A	5.7	4.6	3.6	2.8	2.2	1.7	1.4	1.1
Rated Power ¹	P_r	W	64	64	64	63	63	63	63	62
No Load Speed	ω_{nl}	rpm	4610	4620	4590	4590	4620	4570	4600	4550
No Load Current	I_{nl}	A	0.57	0.45	0.36	0.28	0.23	0.18	0.15	0.11
Motor Constant	K_M	Nm/ \sqrt{W}	0.059	0.059	0.060	0.061	0.061	0.062	0.061	0.062
		oz-in/ \sqrt{W}	8.3	8.4	8.5	8.6	8.6	8.7	8.7	8.7
Torque Constant	K_T	Nm/A	0.0306	0.0383	0.0484	0.0612	0.0766	0.0974	0.122	0.156
		oz-in/A	4.33	5.42	6.86	8.67	10.8	13.8	17.3	22.0
Voltage Constant	K_E	V/(rad/s)	0.0306	0.0383	0.0484	0.0612	0.0766	0.0974	0.122	0.156
		V/krpm	3.20	4.01	5.07	6.41	8.02	10.2	12.8	16.3
Terminal Resistance	R_{mt}	Ω	0.270	0.420	0.650	1.01	1.57	2.50	3.96	6.33
Inductance	L	mH	0.40	0.62	1.0	1.6	2.5	4.0	6.4	10
Peak Current	I_{pk}	A	44	36	29	24	19	15	12	9.6
Electrical Time Constant	τ_e	ms	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6
Mechanical Time Constant	τ_m	ms	7.5	7.5	7.2	7.0	7.0	6.9	6.9	6.8

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



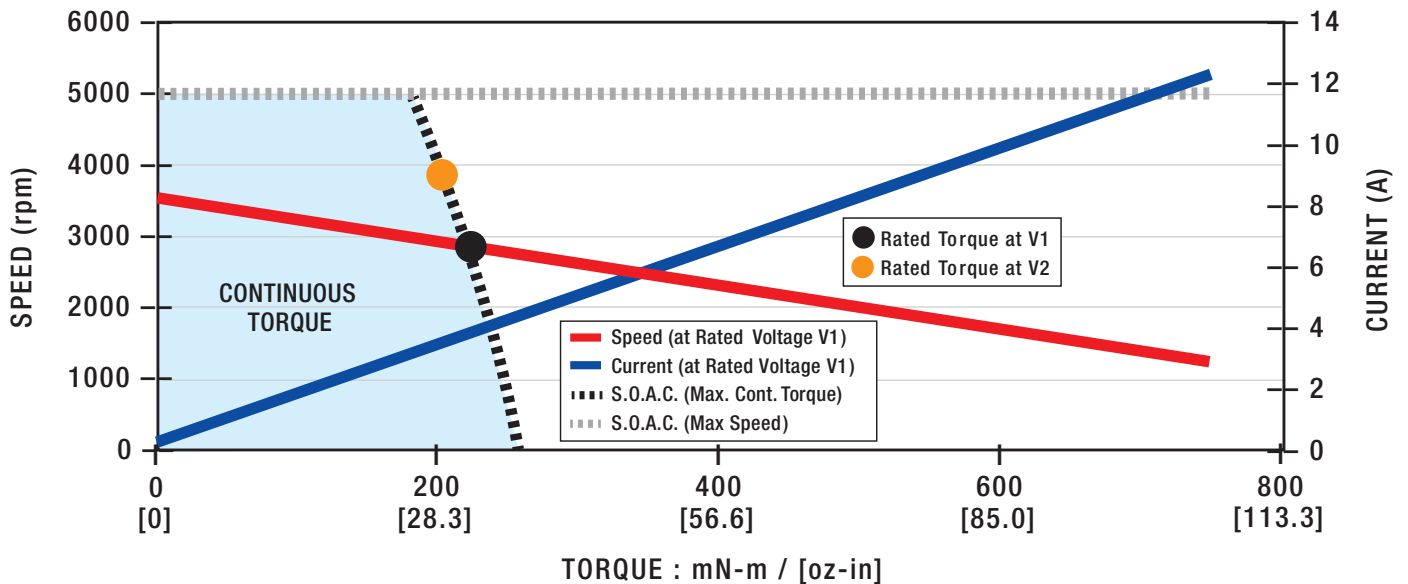
Motor Data		Units								
Rated Voltage V1	V_r	V	12.0	15.2	19.1	24.0	30.3	38.2	48.0	60.6
Rated Torque ¹ •	T_r	Nm	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
		oz-in	27	27	26	26	26	26	26	26
Rated Speed ¹	ω_r	rpm	2620	2700	2690	2690	2730	2720	2710	2700
Rated Current ¹	I_r	A	6.4	5.0	4.0	3.1	2.5	2.0	1.6	1.2
Rated Power ¹	P_r	W	52	53	53	53	53	53	53	52
No Load Speed	ω_{nl}	rpm	2990	3040	3010	3000	3020	3010	3000	2980
No Load Current	I_{nl}	A	0.49	0.40	0.31	0.25	0.20	0.16	0.13	0.097
Rated Voltage V2	V_r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4
		Nm	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Rated Torque ¹ •	T_r	oz-in	25	24	24	24	24	24	24	24
		rpm	3590	3650	3630	3650	3690	3660	3670	3640
Rated Current ¹	I_r	A	5.9	4.7	3.7	2.9	2.3	1.8	1.4	1.1
Rated Power ¹	P_r	W	66	66	65	65	65	65	65	65
No Load Speed	ω_{nl}	rpm	3800	3820	3790	3790	3820	3790	3800	3770
No Load Current	I_{nl}	A	0.52	0.42	0.33	0.26	0.21	0.17	0.13	0.11
Motor Constant	K_M	Nm/ \sqrt{W}	0.068	0.069	0.070	0.070	0.070	0.071	0.071	0.071
		oz-in/ \sqrt{W}	9.6	9.8	9.9	10	10	10	10	10
Torque Constant	K_T	Nm/A	0.0371	0.0463	0.0587	0.0741	0.0927	0.117	0.148	0.188
		oz-in/A	5.25	6.56	8.32	10.5	13.1	16.6	21.0	26.6
Voltage Constant	K_E	V/(rad/s)	0.0371	0.0463	0.0587	0.0741	0.0927	0.117	0.148	0.188
		V/krpm	3.88	4.85	6.15	7.76	9.71	12.3	15.5	19.7
Terminal Resistance	R_{mt}	Ω	0.300	0.450	0.710	1.11	1.73	2.75	4.36	6.97
Inductance	L	mH	0.45	0.71	1.1	1.8	2.8	4.5	7.2	12
Peak Current	I_{pk}	A	40	34	27	22	18	14	11	8.7
Electrical Time Constant	τ_e	ms	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7
Mechanical Time Constant	τ_m	ms	6.8	6.5	6.4	6.3	6.3	6.2	6.2	6.1

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	30.3	38.2	48.0	60.6
Rated Torque ¹ •	T _r	Nm	0.23	0.22	0.22	0.22	0.22	0.22	0.22	0.22
		oz-in	32	32	32	31	31	31	31	31
Rated Speed ¹	ω _r	rpm	2940	2850	2880	2880	2890	2920	2900	2900
Rated Current ¹	I _r	A	8.3	6.2	4.9	3.9	3.0	2.4	1.9	1.5
Rated Power ¹	P _r	W	69	67	67	67	67	67	67	67
No Load Speed	ω _{nl}	rpm	3320	3160	3180	3150	3150	3170	3150	3150
No Load Current	I _{nl}	A	0.56	0.42	0.34	0.27	0.21	0.17	0.13	0.11
Rated Voltage V2	V _r	V	15.2	19.1	24.0	30.3	38.2	48.0	60.6	76.4
Rated Torque ¹ •	T _r	Nm	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20
		oz-in	30	29	29	29	29	29	29	29
Rated Speed ¹	ω _r	rpm	4000	3830	3870	3880	3880	3900	3890	3890
Rated Current ¹	I _r	A	7.8	5.8	4.6	3.6	2.8	2.3	1.8	1.4
Rated Power ¹	P _r	W	88	83	84	83	83	83	83	82
No Load Speed	ω _{nl}	rpm	4210	3980	4000	3990	3980	3990	3980	3970
No Load Current	I _{nl}	A	0.59	0.44	0.36	0.28	0.22	0.18	0.14	0.11
Motor Constant	K _M	Nm/√W	0.072	0.075	0.076	0.077	0.077	0.078	0.078	0.078
		oz-in/√W	10	11	11	11	11	11	11	11
Torque Constant	K _T	Nm/A	0.0335	0.0446	0.0557	0.0706	0.0892	0.112	0.141	0.179
		oz-in/A	4.75	6.32	7.88	9.99	12.6	15.8	20.0	25.3
Voltage Constant	K _E	V/(rad/s)	0.0335	0.0446	0.0557	0.0706	0.0892	0.112	0.141	0.179
		V/krpm	3.51	4.67	5.83	7.39	9.34	11.7	14.8	18.7
Terminal Resistance	R _{mt}	Ω	0.220	0.350	0.540	0.840	1.32	2.06	3.28	5.20
Inductance	L	mH	0.31	0.54	0.85	1.4	2.2	3.4	5.4	8.7
Peak Current	I _{pk}	A	55	43	35	29	23	19	15	12
Electrical Time Constant	τ _e	ms	1.4	1.5	1.6	1.6	1.6	1.6	1.7	1.7
Mechanical Time Constant	τ _m	ms	7.2	6.5	6.4	6.2	6.1	6.1	6.0	6.0

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	30.3	38.2	48.0	60.6	76.4
Rated Torque ¹ •	T_r	Nm	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
		oz-in	44	44	44	44	44	44	43	43
Rated Speed ¹	ω_r	rpm	3000	2850	2900	2900	2920	2930	2930	2920
Rated Current ¹	I_r	A	8.9	6.7	5.3	4.2	3.3	2.6	2.1	1.6
Rated Power ¹	P_r	W	98	93	94	94	94	94	94	94
No Load Speed	ω_{nl}	rpm	3330	3140	3160	3140	3150	3160	3150	3140
No Load Current	I_{nl}	A	0.51	0.38	0.30	0.24	0.19	0.15	0.12	0.094
Rated Voltage V2	V_r	V	19.1	24.0	30.3	38.2	48.0	60.6	76.4	60.6
Rated Torque ¹ •	T_r	Nm	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.32
		oz-in	41	41	41	41	41	40	40	46
Rated Speed ¹	ω_r	rpm	4020	3820	3890	3880	3880	3920	3910	2150
Rated Current ¹	I_r	A	8.4	6.3	5.0	3.9	3.1	2.5	2.0	1.7
Rated Power ¹	P_r	W	120	120	120	120	120	120	120	72
No Load Speed	ω_{nl}	rpm	4190	3950	3990	3960	3960	3990	3980	2480
No Load Current	I_{nl}	A	0.55	0.40	0.33	0.26	0.20	0.16	0.13	0.089
Motor Constant	K_M	Nm/ \sqrt{W}	0.086	0.091	0.092	0.093	0.094	0.093	0.094	0.094
		oz-in/ \sqrt{W}	12	13	13	13	13	13	13	13
Torque Constant	K_T	Nm/A	0.0424	0.0565	0.0706	0.0897	0.113	0.141	0.179	0.226
		oz-in/A	6.00	8.01	9.99	12.7	16.0	20.0	25.3	32.0
Voltage Constant	K_E	V/(rad/s)	0.0424	0.0565	0.0706	0.0897	0.113	0.141	0.179	0.226
		V/krpm	4.44	5.92	7.39	9.39	11.8	14.8	18.7	23.7
Terminal Resistance	R_{mt}	Ω	0.240	0.390	0.590	0.930	1.46	2.29	3.64	5.78
Inductance	L	mH	0.31	0.56	0.87	1.4	2.2	3.5	5.6	8.9
Peak Current	I_{pk}	A	63	49	41	33	26	21	17	13
Electrical Time Constant	τ_e	ms	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5
Mechanical Time Constant	τ_m	ms	6.3	5.8	5.6	5.5	5.4	5.4	5.4	5.4

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

