



Shown with optional assemblies.

DC040B Series

The DC040B Series Brush Commutated DC Motor is a 40 mm diameter unit offered in 6 lengths with continuous output torques of 0.017 to 0.081 Nm.

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 8,500 RPM possible
- DC bus voltage up to 48 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

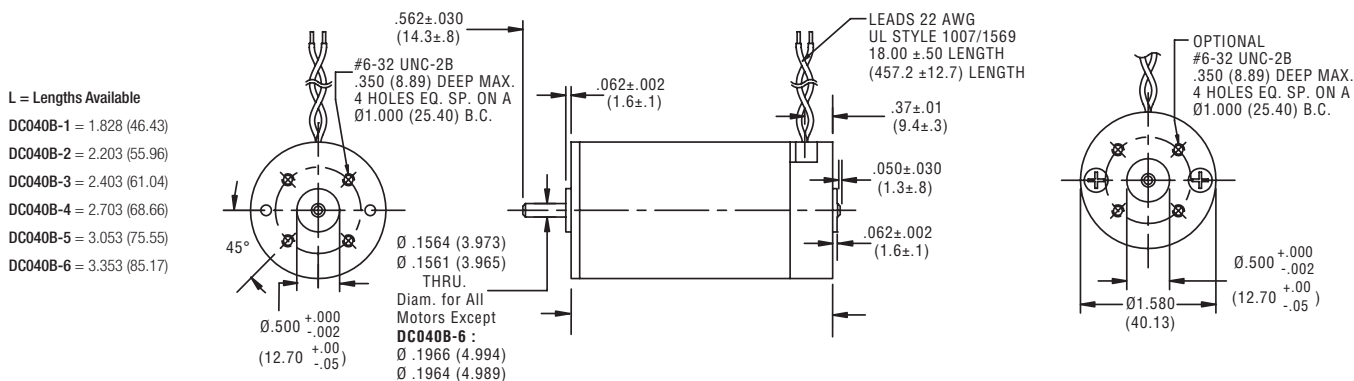
- Encoder: E21C/D, E30C/D
- Gearboxes: G30A, G40A, PLG42S, G51A
- Brakes: B30A, B49A
- Drives: BGE6060A, PBL4850E**

Motor Characteristics

Motor Data	Units	Part No.					
		DC040B-1	DC040B-2	DC040B-3	DC040B-4	DC040B-5	DC040B-6
Max DC Terminal Voltage	V_T	48					
Max Speed (Mechanical)	ω_{MAX}	8000				7000	
Continuous Stall Torque ¹	T_{CS}	0.017	0.033	0.043	0.049	0.067	0.081
		2.4	4.7	6.1	6.9	9.5	12
Peak Torque (Maximum) ¹	T_{pk}	0.086	0.20	0.26	0.32	0.40	0.50
		12	28	37	45	56	71
Coulomb Friction Torque	T_f	0.0035	0.0042	0.0042	0.0046	0.0056	0.0056
		0.50	0.60	0.60	0.65	0.80	0.80
Viscous Damping Factor	D	1.8E-06	2.3E-06	2.6E-06	3.0E-06	3.5E-06	3.7E-06
		0.028	0.034	0.039	0.045	0.053	0.055
Thermal Time Constant	τ_{th}	7.2	11	12	13	14	14
Thermal Resistance	R_{th}	23	19	17	15	14	11
Max. Winding Temperature	Θ_{MAX}	155	155	155	155	155	155
Rotor Inertia	J_r	1.9E-06	3.2E-06	4.2E-06	5.6E-06	7.1E-06	8.5E-06
		2.7E-04	4.6E-04	5.9E-04	7.9E-04	0.0010	0.0012
Motor Weight	W_m	200	250	290	340	390	440
		7.0	8.9	10	12	14	16

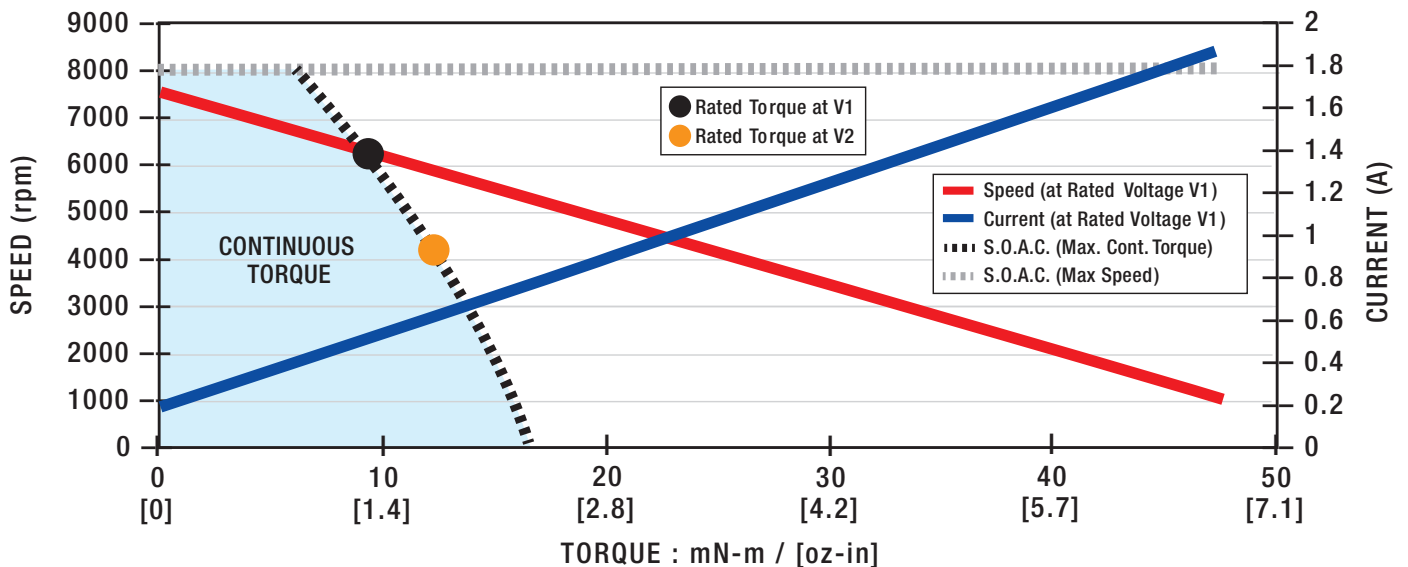
¹Recorded at maximum winding temperature at 25°C ambient and without heatsink. **For PBL4850E to operate a brush motor, an encoder is required.

Dimensional Drawings: DC040B-1 • DC040B-2 • DC040B-3 • DC040B-4 • DC040B-5 • DC040B-6



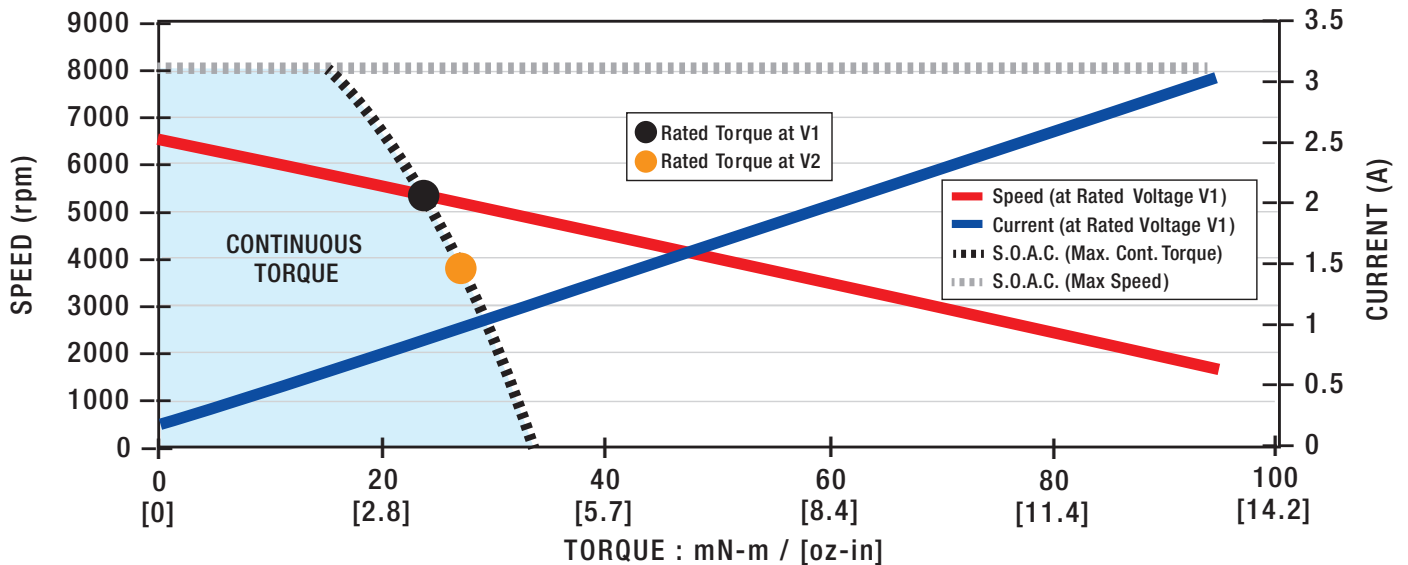
Motor Data		Units								
Rated Voltage V1	V_r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	48.0
Rated Torque ¹ •	T_r	Nm	0.010	0.0099	0.0095	0.0094	0.0093	0.0092	0.0092	0.0092
		oz-in	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3
Rated Speed ¹	ω_r	rpm	6020	6080	6230	6230	6260	6320	6300	6290
Rated Current ¹	I_r	A	1.4	1.1	0.83	0.65	0.51	0.40	0.32	0.25
Rated Power ¹	P_r	W	6.5	6.3	6.2	6.1	6.1	6.1	6.0	6.0
No Load Speed	ω_{nl}	rpm	6930	6850	6910	6880	6890	6910	6880	6880
No Load Current	I_{nl}	A	0.40	0.32	0.25	0.20	0.16	0.13	0.099	0.079
Rated Voltage V2	V_r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.3	38.2
Rated Torque ¹ •	T_r	Nm	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012
		oz-in	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7
Rated Speed ¹	ω_r	rpm	3970	4060	4130	4200	4220	4230	4230	4250
Rated Current ¹	I_r	A	1.6	1.2	0.98	0.77	0.61	0.48	0.38	0.30
Rated Power ¹	P_r	W	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
No Load Speed	ω_{nl}	rpm	5440	5400	5400	5420	5430	5430	5410	5430
No Load Current	I_{nl}	A	0.38	0.30	0.24	0.19	0.15	0.12	0.093	0.074
Motor Constant	K_M	Nm/ \sqrt{W}	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
		oz-in/ \sqrt{W}	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Torque Constant	K_T	Nm/A	0.0122	0.0156	0.0196	0.0247	0.0310	0.0391	0.0495	0.0622
		oz-in/A	1.73	2.20	2.77	3.50	4.39	5.53	7.00	8.80
Voltage Constant	K_E	V/(rad/s)	0.0122	0.0156	0.0196	0.0247	0.0310	0.0391	0.0495	0.0622
		V/krpm	1.28	1.63	2.05	2.59	3.25	4.09	5.18	6.51
Terminal Resistance	R_{mt}	Ω	1.25	1.93	2.99	4.70	7.38	11.6	18.5	29.2
Inductance	L	mH	0.72	1.2	1.8	2.9	4.6	7.3	12	19
Peak Current	I_{pk}	A	7.6	6.2	5.1	4.1	3.3	2.6	2.1	1.6
Electrical Time Constant	τ_e	ms	0.58	0.60	0.61	0.63	0.63	0.63	0.63	0.63
Mechanical Time Constant	τ_m	ms	16	15	15	15	15	14	14	14

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



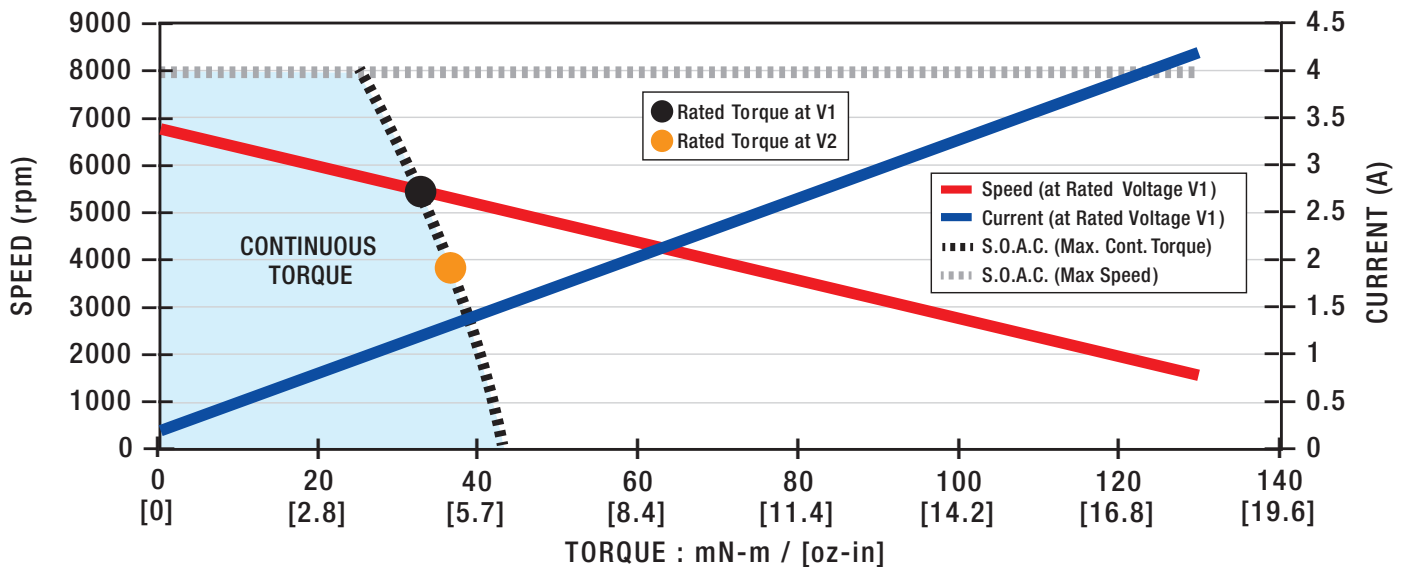
Motor Data		Units								
Rated Voltage V1	V _r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	48.0
Rated Torque ¹ •	T _r	Nm	0.026	0.025	0.024	0.024	0.024	0.023	0.023	0.023
		oz-in	3.6	3.5	3.4	3.4	3.3	3.3	3.3	3.3
Rated Speed ¹	ω _r	rpm	5000	5100	5300	5310	5350	5360	5390	5390
Rated Current ¹	I _r	A	2.4	1.8	1.4	1.1	0.89	0.70	0.55	0.44
Rated Power ¹	P _r	W	13	13	13	13	13	13	13	13
No Load Speed	ω _{nl}	rpm	5870	5810	5920	5870	5880	5860	5880	5880
No Load Current	I _{nl}	A	0.38	0.30	0.25	0.19	0.16	0.12	0.095	0.076
Rated Voltage V2	V _r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.3	38.2
Rated Torque ¹ •	T _r	Nm	0.028	0.028	0.027	0.027	0.027	0.027	0.027	0.027
		oz-in	4.0	3.9	3.9	3.8	3.8	3.8	3.8	3.8
Rated Speed ¹	ω _r	rpm	3440	3570	3680	3750	3790	3780	3810	3830
Rated Current ¹	I _r	A	2.6	2.0	1.6	1.2	0.98	0.77	0.61	0.49
Rated Power ¹	P _r	W	10	10	11	11	11	11	11	11
No Load Speed	ω _{nl}	rpm	4630	4600	4650	4650	4660	4620	4640	4660
No Load Current	I _{nl}	A	0.36	0.29	0.23	0.18	0.15	0.12	0.090	0.072
Motor Constant	K _M	Nm/√W	0.017	0.018	0.018	0.019	0.019	0.019	0.019	0.019
		oz-in/√W	2.5	2.6	2.6	2.6	2.7	2.7	2.7	2.7
Torque Constant	K _T	Nm/A	0.0148	0.0188	0.0234	0.0297	0.0372	0.0472	0.0593	0.0746
		oz-in/A	2.10	2.66	3.31	4.21	5.27	6.68	8.40	10.6
Voltage Constant	K _E	V/(rad/s)	0.0148	0.0188	0.0234	0.0297	0.0372	0.0472	0.0593	0.0746
		V/krpm	1.55	1.97	2.45	3.11	3.90	4.94	6.21	7.81
Terminal Resistance	R _{mt}	Ω	0.720	1.08	1.63	2.53	3.94	6.21	9.78	15.4
Inductance	L	mH	0.52	0.84	1.3	2.1	3.3	5.3	8.3	13
Peak Current	I _{pk}	A	13	11	9.3	7.5	6.1	4.9	3.9	3.1
Electrical Time Constant	τ _e	ms	0.72	0.78	0.79	0.82	0.84	0.85	0.85	0.85
Mechanical Time Constant	τ _m	ms	11	9.9	9.7	9.3	9.2	9.1	9.0	9.0

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



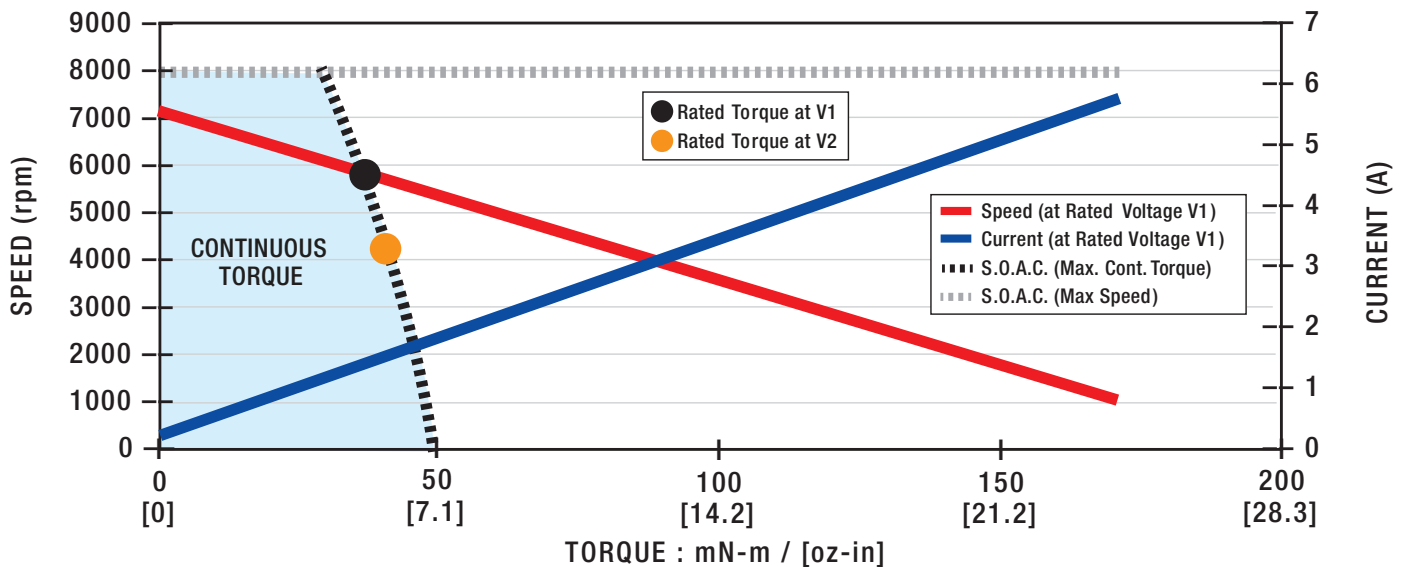
Motor Data		Units								
Rated Voltage V1	V _r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	48.0
Rated Torque ¹ •	T _r	Nm	0.035	0.034	0.034	0.033	0.033	0.033	0.032	0.032
		oz-in	5.0	4.9	4.8	4.7	4.7	4.6	4.6	4.6
Rated Speed ¹	ω _r	rpm	5030	5170	5280	5450	5430	5480	5490	5490
Rated Current ¹	I _r	A	3.2	2.5	1.9	1.5	1.2	0.95	0.75	0.59
Rated Power ¹	P _r	W	19	19	19	19	19	19	19	19
No Load Speed	ω _{nl}	rpm	6050	6020	6000	6090	6030	6050	6040	6030
No Load Current	I _{nl}	A	0.41	0.33	0.26	0.21	0.17	0.13	0.11	0.081
Rated Voltage V2	V _r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.3	38.2
		Nm	0.038	0.038	0.037	0.037	0.036	0.036	0.036	0.036
Rated Torque ¹ •	T _r	oz-in	5.4	5.3	5.3	5.2	5.2	5.1	5.1	5.1
		rpm	3460	3620	3690	3870	3870	3890	3910	3930
Rated Current ¹	I _r	A	3.4	2.7	2.1	1.7	1.3	1.0	0.81	0.65
Rated Power ¹	P _r	W	14	14	14	15	15	15	15	15
No Load Speed	ω _{nl}	rpm	4780	4770	4720	4830	4780	4780	4770	4780
No Load Current	I _{nl}	A	0.39	0.31	0.24	0.20	0.16	0.13	0.096	0.077
Motor Constant	K _M	Nm/√W	0.019	0.020	0.021	0.021	0.021	0.021	0.021	0.021
		oz-in/√W	2.7	2.8	2.9	3.0	3.0	3.0	3.0	3.0
Torque Constant	K _T	Nm/A	0.0144	0.0182	0.0232	0.0287	0.0365	0.0459	0.0581	0.0731
		oz-in/A	2.04	2.58	3.29	4.07	5.17	6.50	8.22	10.3
Voltage Constant	K _E	V/(rad/s)	0.0144	0.0182	0.0232	0.0287	0.0365	0.0459	0.0581	0.0731
		V/krpm	1.51	1.91	2.43	3.01	3.82	4.81	6.08	7.65
Terminal Resistance	R _{mt}	Ω	0.560	0.830	1.26	1.89	2.96	4.62	7.30	11.5
Inductance	L	mH	0.39	0.63	1.0	1.6	2.5	4.0	6.4	10
Peak Current	I _{pk}	A	17	14	12	10	8.1	6.6	5.2	4.2
Electrical Time Constant	τ _e	ms	0.70	0.76	0.81	0.83	0.85	0.86	0.87	0.87
Mechanical Time Constant	τ _m	ms	11	10	9.7	9.5	9.3	9.1	9.0	9.0

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



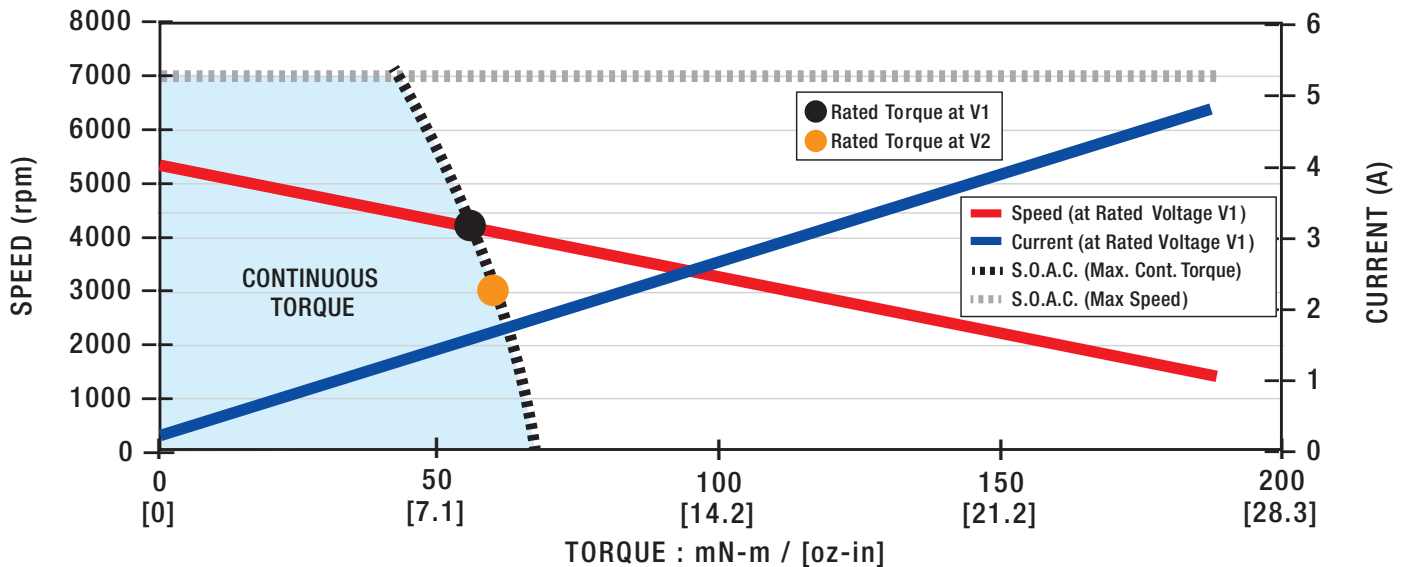
Motor Data		Units								
Rated Voltage V1	V_r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	48.0
Rated Torque ¹ •	T_r	Nm	0.040	0.038	0.037	0.037	0.036	0.036	0.036	0.036
		oz-in	5.6	5.4	5.3	5.2	5.1	5.1	5.0	5.0
Rated Speed ¹	ω_r	rpm	5160	5480	5640	5660	5810	5810	5850	5820
Rated Current ¹	I_r	A	3.7	2.9	2.2	1.7	1.4	1.1	0.86	0.68
Rated Power ¹	P_r	W	22	22	22	22	22	22	22	22
No Load Speed	ω_{nl}	rpm	6180	6290	6290	6220	6320	6280	6310	6260
No Load Current	I_{nl}	A	0.47	0.38	0.30	0.24	0.19	0.15	0.12	0.094
Rated Voltage V2	V_r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.3	38.2
Rated Torque ¹ •	T_r	Nm	0.043	0.042	0.042	0.041	0.041	0.040	0.040	0.040
		oz-in	6.1	6.0	5.9	5.8	5.7	5.7	5.7	5.7
Rated Speed ¹	ω_r	rpm	3560	3860	3960	4060	4170	4160	4200	4200
Rated Current ¹	I_r	A	3.9	3.1	2.4	1.9	1.5	1.2	0.94	0.74
Rated Power ¹	P_r	W	16	17	17	17	18	18	18	18
No Load Speed	ω_{nl}	rpm	4880	4990	4950	4940	5020	4960	4980	4970
No Load Current	I_{nl}	A	0.44	0.36	0.28	0.22	0.18	0.14	0.12	0.088
Motor Constant	K_M	Nm/ \sqrt{W}	0.020	0.021	0.022	0.023	0.023	0.023	0.023	0.023
		oz-in/ \sqrt{W}	2.9	3.0	3.1	3.2	3.2	3.3	3.3	3.3
Torque Constant	K_T	Nm/A	0.0141	0.0175	0.0222	0.0282	0.0349	0.0443	0.0557	0.0705
		oz-in/A	2.00	2.47	3.14	3.99	4.94	6.27	7.88	9.98
Voltage Constant	K_E	V/(rad/s)	0.0141	0.0175	0.0222	0.0282	0.0349	0.0443	0.0557	0.0705
		V/krpm	1.48	1.83	2.32	2.95	3.65	4.64	5.83	7.38
Terminal Resistance	R_{mt}	Ω	0.480	0.680	1.02	1.56	2.37	3.72	5.83	9.23
Inductance	L	mH	0.33	0.51	0.82	1.3	2.1	3.3	5.2	8.4
Peak Current	I_{pk}	A	20	18	15	12	10	8.1	6.6	5.2
Electrical Time Constant	τ_e	ms	0.69	0.75	0.80	0.85	0.86	0.89	0.89	0.90
Mechanical Time Constant	τ_m	ms	13	12	12	11	11	11	10	10

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



Motor Data		Units								
Rated Voltage V1	V_r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	48.0
Rated Torque ¹ •	T_r	Nm	0.059	0.057	0.056	0.056	0.055	0.055	0.055	0.055
		oz-in	8.3	8.1	8.0	7.9	7.8	7.8	7.8	7.8
Rated Speed ¹	ω_r	rpm	3730	3980	4090	4110	4210	4230	4250	4230
Rated Current ¹	I_r	A	4.0	3.2	2.5	1.9	1.6	1.2	0.96	0.76
Rated Power ¹	P_r	W	23	24	24	24	24	24	24	24
No Load Speed	ω_{nl}	rpm	4720	4810	4800	4750	4820	4800	4810	4780
No Load Current	I_{nl}	A	0.40	0.33	0.26	0.21	0.17	0.13	0.11	0.081
Rated Voltage V2	V_r	V	7.58	9.55	12.0	15.2	19.1	24.0	30.3	38.2
Rated Torque ¹ •	T_r	Nm	0.062	0.061	0.060	0.060	0.059	0.059	0.059	0.059
		oz-in	8.8	8.6	8.5	8.5	8.4	8.4	8.4	8.3
Rated Speed ¹	ω_r	rpm	2530	2770	2840	2920	3000	3000	3030	3030
Rated Current ¹	I_r	A	4.2	3.3	2.6	2.0	1.6	1.3	1.0	0.81
Rated Power ¹	P_r	W	16	18	18	18	19	19	19	19
No Load Speed	ω_{nl}	rpm	3730	3810	3770	3770	3820	3790	3800	3790
No Load Current	I_{nl}	A	0.39	0.31	0.25	0.20	0.16	0.13	0.097	0.077
Motor Constant	K_M	Nm/ \sqrt{W}	0.026	0.027	0.028	0.029	0.029	0.029	0.030	0.030
		oz-in/ \sqrt{W}	3.7	3.9	4.0	4.1	4.1	4.2	4.2	4.2
Torque Constant	K_T	Nm/A	0.0185	0.0229	0.0291	0.0370	0.0458	0.0582	0.0731	0.0925
		oz-in/A	2.62	3.25	4.12	5.23	6.49	8.24	10.4	13.1
Voltage Constant	K_E	V/(rad/s)	0.0185	0.0229	0.0291	0.0370	0.0458	0.0582	0.0731	0.0925
		V/krpm	1.94	2.40	3.05	3.87	4.80	6.09	7.66	9.69
Terminal Resistance	R_{mt}	Ω	0.500	0.710	1.07	1.64	2.49	3.91	6.14	9.72
Inductance	L	mH	0.43	0.66	1.1	1.7	2.6	4.2	6.7	11
Peak Current	I_{pk}	A	19	17	14	12	9.6	7.7	6.2	4.9
Electrical Time Constant	τ_e	ms	0.86	0.93	0.99	1.0	1.1	1.1	1.1	1.1
Mechanical Time Constant	τ_m	ms	10	9.5	8.9	8.5	8.4	8.2	8.1	8.0

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	48.0	
Rated Torque ¹ •	T_r	Nm	0.071	0.070	0.069	0.068	0.068	0.068	0.068	0.068	0.072
		oz-in	10	9.9	9.8	9.7	9.6	9.6	9.6	9.6	10
Rated Speed ¹	ω_r	rpm	4260	4540	4590	4590	4730	4730	4720	3390	
Rated Current ¹	I_r	A	4.2	3.3	2.6	2.0	1.6	1.3	1.0	0.85	
Rated Power ¹	P_r	W	32	33	33	33	34	34	33	26	
No Load Speed	ω_{nl}	rpm	5210	5330	5290	5220	5330	5310	5270	4170	
No Load Current	I_{nl}	A	0.37	0.30	0.24	0.19	0.15	0.12	0.092	0.069	
Rated Voltage V2	V_r	V	9.55	12.0	15.2	19.1	24.0	30.3	38.2	38.2	
Rated Torque ¹ •	T_r	Nm	0.075	0.074	0.073	0.073	0.072	0.072	0.072	0.072	0.075
		oz-in	11	10	10	10	10	10	10	10	11
Rated Speed ¹	ω_r	rpm	2970	3170	3270	3290	3380	3390	3410	2360	
Rated Current ¹	I_r	A	4.4	3.5	2.7	2.1	1.7	1.4	1.1	0.88	
Rated Power ¹	P_r	W	23	25	25	25	26	26	26	19	
No Load Speed	ω_{nl}	rpm	4130	4200	4190	4150	4210	4200	4190	3310	
No Load Current	I_{nl}	A	0.35	0.28	0.22	0.18	0.14	0.11	0.087	0.066	
Motor Constant	K_M	Nm/ \sqrt{W}	0.029	0.030	0.030	0.031	0.031	0.031	0.032	0.032	
		oz-in/ \sqrt{W}	4.0	4.2	4.3	4.4	4.4	4.5	4.5	4.5	
Torque Constant	K_T	Nm/A	0.0212	0.0263	0.0333	0.0424	0.0524	0.0664	0.0840	0.106	
		oz-in/A	3.00	3.72	4.72	6.00	7.42	9.40	11.9	15.0	
Voltage Constant	K_E	V/(rad/s)	0.0212	0.0263	0.0333	0.0424	0.0524	0.0664	0.0840	0.106	
		V/krpm	2.22	2.75	3.49	4.44	5.49	6.95	8.80	11.1	
Terminal Resistance	R_{mt}	Ω	0.550	0.790	1.20	1.85	2.82	4.45	6.98	11.1	
Inductance	L	mH	0.49	0.75	1.2	2.0	3.0	4.9	7.7	12	
Peak Current	I_{pk}	A	22	19	16	13	11	8.6	6.9	4.3	
Electrical Time Constant	τ_e	ms	0.89	0.95	1.0	1.1	1.1	1.1	1.1	1.1	
Mechanical Time Constant	τ_m	ms	10	9.7	9.2	8.7	8.7	8.6	8.4	8.4	

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

