



## EC083A Series

The EC083A Series Brushless DC Motor is a high torque model brushless motor designed in a NEMA 34 package. It is offered in 6 motor lengths with continuous torque from 0.9 – 2.1 Nm.

### EC Instrument Grade Motors

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

#### Benefits

- Speeds up to 6,000 RPM possible
- DC bus voltage up to 325 VDC
- Capable of 24 VDC bus systems
- NEMA 34 package
- 8 pole neodymium design

#### Optional Assemblies

- Encoders: Z Type, C Type
- Programmable Drive: BGE6060A

### Motor Characteristics

Motor Data	Units	Part No.						
		EC083A-1	EC083A-2	EC083A-3	EC083A-4	EC083A-5	EC083A-6	
Max DC Terminal Voltage	$V_T$	325						
Max Speed (Mechanical)	$\omega_{MAX}$	6000						
Continuous Stall Torque <sup>1</sup>	$T_{CS}$	Nm	0.91	1.4	1.7	1.9	2.1	2.1
		oz-in	130	200	240	260	300	300
Peak Torque (Maximum) <sup>1</sup>	$T_{PK}$	Nm	2.9	4.5	5.2	5.9	6.8	6.9
		oz-in	410	640	740	830	970	970
Coulomb Friction Torque	$T_f$	Nm	0.020	0.030	0.038	0.041	0.045	0.047
		oz-in	2.8	4.3	5.4	5.8	6.4	6.7
Viscous Damping Factor	$D$	Nm/(rad/s)	1.3E-05	1.3E-05	4.7E-05	4.7E-05	6.7E-05	6.7E-05
		oz-in/krpm	0.20	0.20	0.70	0.70	1.0	1.0
Thermal Time Constant	$\tau_{th}$	min	15	15	15	15	15	15
Thermal Resistance	$R_{th}$	°C/W	1.5	1.4	1.4	1.4	1.3	1.1
Max. Winding Temperature	$\Theta_{MAX}$	°C	125	125	125	125	125	125
Rotor Inertia	$J_r$	kg-m <sup>2</sup>	6.8E-05	1.0E-04	1.2E-04	1.6E-04	2.0E-04	2.4E-04
		oz-in-s <sup>2</sup>	0.0096	0.014	0.018	0.022	0.029	0.034
Motor Weight	$W_m$	g	1400	2000	2500	3000	3500	4100
		oz	50	70	88	110	120	140

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.

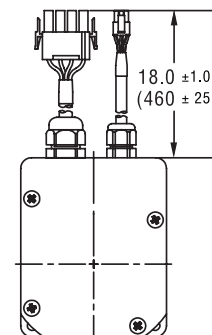
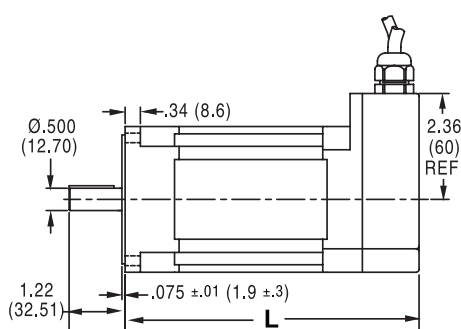
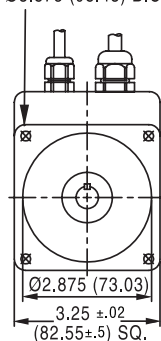
### Dimensional Drawings: EC083A-1 • EC083A-2 • EC083A-3 • EC083A-4 • EC083A-5 • EC083A-6

Dimensions = inches (mm)

L = Lengths Available

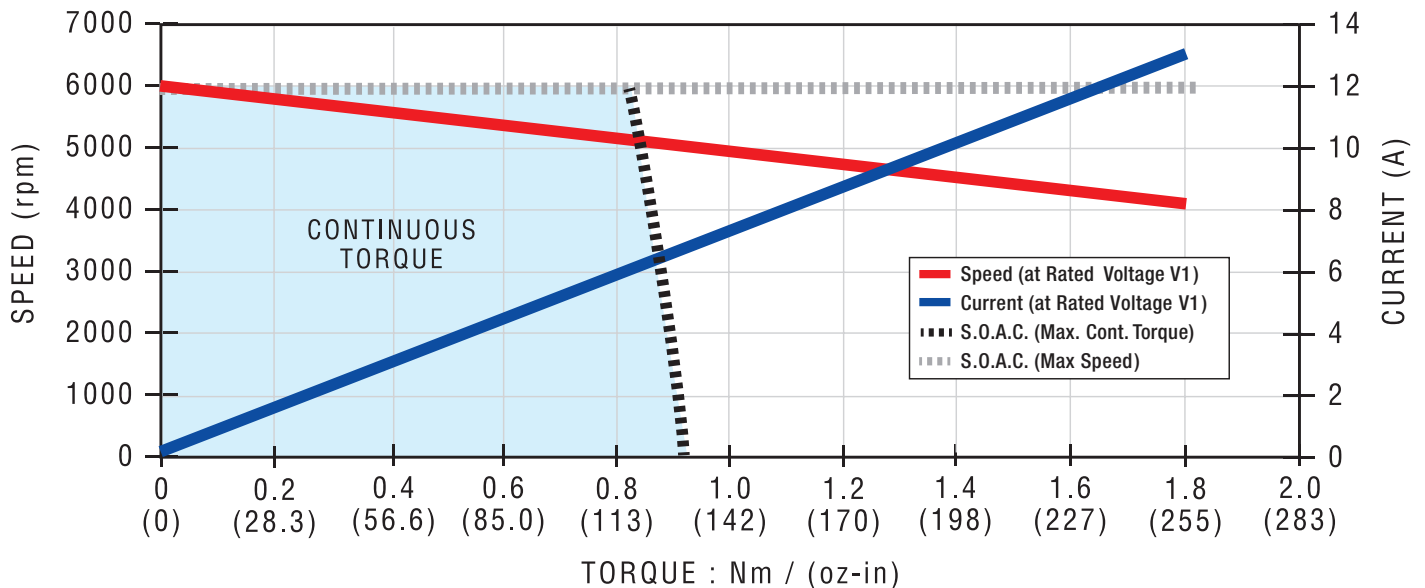
- EC083A-1** = 4.05 (102.9)
- EC083A-2** = 4.55 (115.6)
- EC083A-3** = 5.05 (128.3)
- EC083A-4** = 5.55 (141.0)
- EC083A-5** = 6.05 (153.7)
- EC083A-6** = 6.55 (166.4)

Ø .218 (5.54) THRU (4)  
EQUALLY SPACED ON A  
Ø3.875 (98.43) B.C.



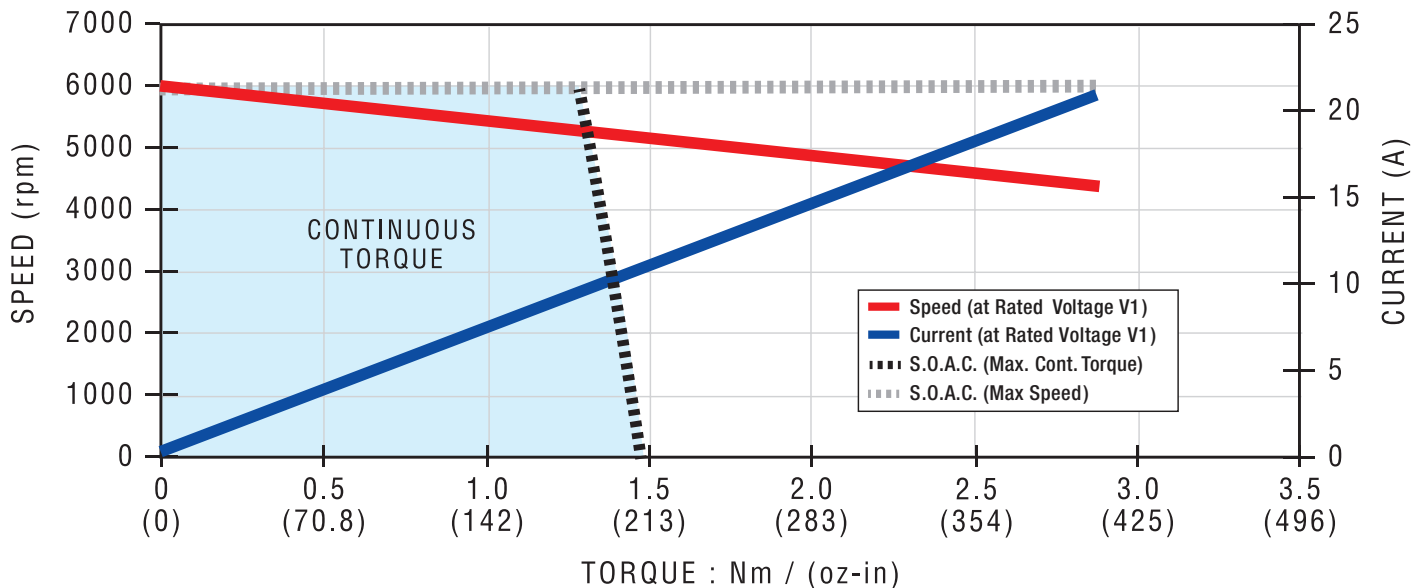
Motor Data		Units						
Rated Voltage <b>V1</b>	$V_r$	V	60.0	76.0	96.0	152	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	0.80	0.81	0.81	0.79	0.78	0.78
		oz-in	110	110	120	110	110	110
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	31	23	18	12	9.9	6.3
Rated Power <sup>1</sup>	$P_r$	W	500	510	510	500	490	490
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	0.97	0.71	0.55	0.39	0.31	0.20
Rated Voltage <b>V2</b>	$V_r$	V	38.0	38.0	76.0	76.0	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	0.81	0.83	0.82	0.81	0.79	0.79
		oz-in	110	120	120	110	110	110
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	31	23	18	12	9.9	6.3
Rated Power <sup>1</sup>	$P_r$	W	510	520	510	510	500	500
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	0.97	0.71	0.55	0.39	0.31	0.20
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.15	0.15	0.16	0.15	0.15	0.15
		oz-in/ $\sqrt{W}$	21	22	22	21	21	21
Torque Constant	$K_T$	Nm/A	0.0294	0.0405	0.0516	0.0736	0.0921	0.143
		oz-in/A	4.17	5.73	7.30	10.4	13.0	20.3
Voltage Constant	$K_E$	V/(rad/s)	0.0294	0.0405	0.0516	0.0736	0.0921	0.143
		V/krpm	3.08	4.24	5.40	7.71	9.64	15.0
Terminal Resistance	$R_{mt}$	$\Omega$	0.0400	0.0700	0.110	0.240	0.370	0.920
Inductance	L	mH	0.14	0.26	0.43	0.88	1.4	3.3
Peak Current	$I_{pk}$	A	110	81	63	42	36	22
Electrical Time Constant	$\tau_e$	ms	3.5	3.7	3.9	3.7	3.8	3.6
Mechanical Time Constant	$\tau_m$	ms	3.1	2.9	2.8	3.0	3.0	3.0

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.



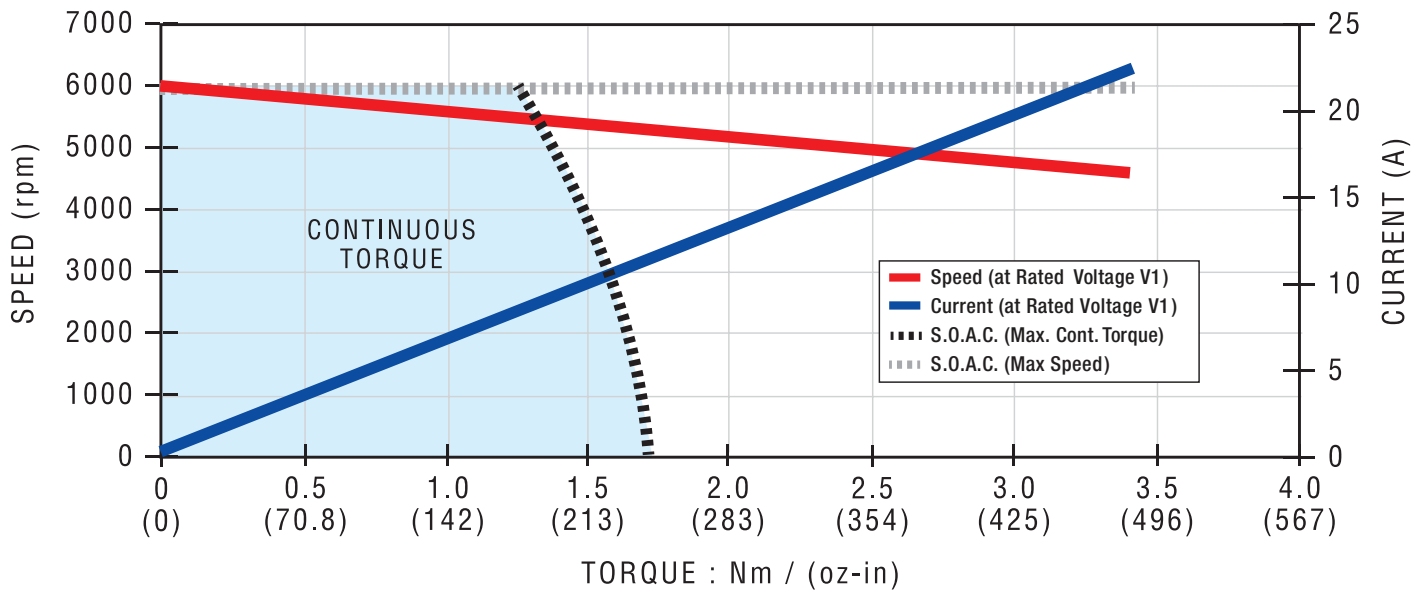
Motor Data		Units						
Rated Voltage <b>V1</b>	$V_r$	V	76.0	76.0	152	152	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.2	1.3	1.2	1.2	1.2	1.2
		oz-in	180	180	180	180	170	170
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	23	18	12	9.8	6.3	5.1
Rated Power <sup>1</sup>	$P_r$	W	780	790	780	780	770	760
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	0.65	0.51	0.33	0.28	0.18	0.15
Rated Voltage <b>V2</b>	$V_r$	V	38.0	48.0	76.0	76.0	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.3	1.3	1.3	1.3	1.3	1.3
		oz-in	180	180	180	190	180	180
Rated Speed <sup>1</sup>	$\omega_r$	rpm	5930	5860	5930	4920	6000	5270
Rated Current <sup>1</sup>	$I_r$	A	23	19	12	10	6.3	5.2
Rated Power <sup>1</sup>	$P_r$	W	800	800	800	690	790	710
No Load Speed	$\omega_{nl}$	rpm	5970	5920	5970	5050	6000	5370
No Load Current	$I_{nl}$	A	0.65	0.51	0.33	0.27	0.18	0.15
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.21	0.21	0.22	0.22	0.21	0.21
		oz-in/ $\sqrt{W}$	30	30	31	31	30	30
Torque Constant	$K_T$	Nm/A	0.0606	0.0772	0.121	0.143	0.222	0.269
		oz-in/A	8.59	10.9	17.2	20.3	31.4	38.1
Voltage Constant	$K_E$	V/(rad/s)	0.0606	0.0772	0.121	0.143	0.222	0.269
		V/krpm	6.35	8.08	12.7	15.0	23.2	28.2
Terminal Resistance	$R_{mt}$	$\Omega$	0.0800	0.130	0.310	0.440	1.07	1.65
Inductance	L	mH	0.33	0.54	1.4	1.9	4.5	6.7
Peak Current	$I_{pk}$	A	84	66	42	36	23	18
Electrical Time Constant	$\tau_e$	ms	4.1	4.2	4.4	4.3	4.2	4.1
Mechanical Time Constant	$\tau_m$	ms	2.2	2.2	2.1	2.2	2.2	2.3

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.



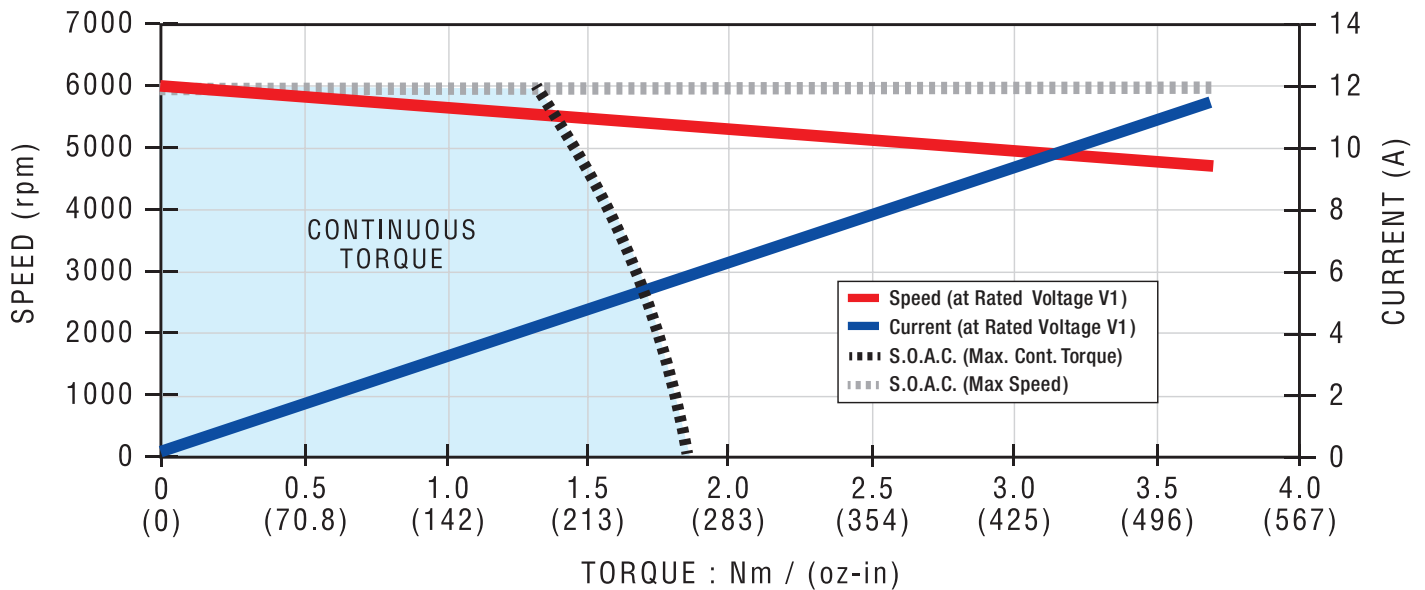
Motor Data		Units					
Rated Voltage <b>V1</b>	$V_r$	V	76.0	96.0	152	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.2	1.2	1.2	1.2	1.2
		oz-in	170	170	170	170	170
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	27	18	13	11	8.9
Rated Power <sup>1</sup>	$P_r$	W	740	750	760	750	760
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	1.4	0.86	0.63	0.53	0.43
Rated Voltage <b>V2</b>	$V_r$	V	38.0	48.0	76.0	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.2	1.2	1.2	1.2	1.2
		oz-in	170	180	170	170	170
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	5890	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	27	18	13	11	8.9
Rated Power <sup>1</sup>	$P_r$	W	760	770	770	760	770
No Load Speed	$\omega_{nl}$	rpm	6000	5730	6000	6000	6000
No Load Current	$I_{nl}$	A	1.4	0.84	0.63	0.53	0.43
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.25	0.25	0.26	0.26	0.25
		oz-in/ $\sqrt{W}$	36	36	36	36	35
Torque Constant	$K_T$	Nm/A	0.0507	0.0797	0.109	0.130	0.159
		oz-in/A	7.18	11.3	15.4	18.5	22.6
Voltage Constant	$K_E$	V/(rad/s)	0.0507	0.0797	0.109	0.130	0.159
		V/krpm	5.31	8.35	11.4	13.7	16.7
Terminal Resistance	$R_{mt}$	$\Omega$	0.0400	0.100	0.180	0.260	0.410
Inductance	L	mH	0.17	0.42	0.78	1.1	1.7
Peak Current	$I_{pk}$	A	120	75	54	45	36
Electrical Time Constant	$\tau_e$	ms	4.3	4.2	4.3	4.3	4.1
Mechanical Time Constant	$\tau_m$	ms	1.9	2.0	1.9	1.9	2.0

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.



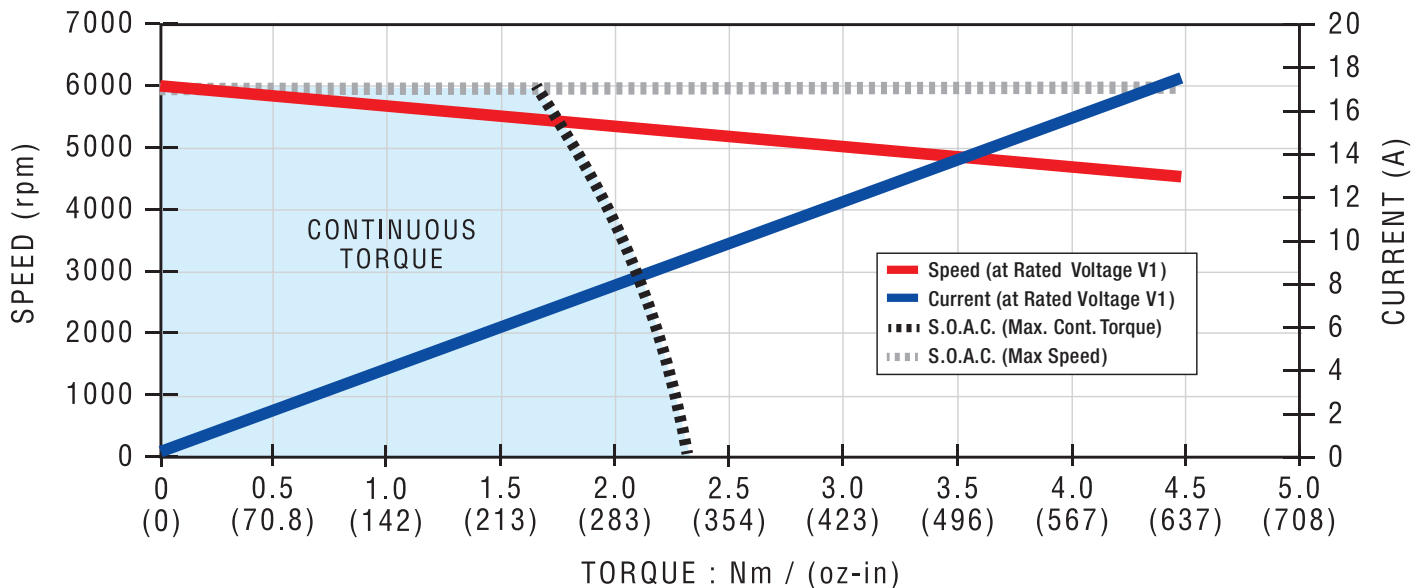
Motor Data		Units						
Rated Voltage <b>V1</b>	$V_r$	V	76.0	76.0	152	152	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.3	1.3	1.3	1.3	1.3	1.3
		oz-in	190	190	180	190	180	180
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	22	16	11	8.1	5.4	4.4
Rated Power <sup>1</sup>	$P_r$	W	840	830	820	840	820	810
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	1.1	0.73	0.51	0.37	0.26	0.21
Rated Voltage <b>V2</b>	$V_r$	V	38.0	48.0	76.0	76.0	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.5	1.5	1.4	1.7	1.4	1.6
		oz-in	210	220	200	240	200	220
Rated Speed <sup>1</sup>	$\omega_r$	rpm	5260	4820	5290	3700	5290	4250
Rated Current <sup>1</sup>	$I_r$	A	24	18	12	9.8	5.9	5.2
Rated Power <sup>1</sup>	$P_r$	W	810	770	800	660	800	700
No Load Speed	$\omega_{nl}$	rpm	5150	4740	5150	3750	5150	4240
No Load Current	$I_{nl}$	A	0.95	0.67	0.48	0.31	0.24	0.19
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.27	0.28	0.28	0.28	0.28	0.27
		oz-in/ $\sqrt{W}$	38	40	39	39	39	38
Torque Constant	$K_T$	Nm/A	0.0702	0.0964	0.140	0.193	0.281	0.341
		oz-in/A	9.94	13.7	19.9	27.3	39.8	48.3
Voltage Constant	$K_E$	V/(rad/s)	0.0702	0.0964	0.140	0.193	0.281	0.341
		V/krpm	7.35	10.1	14.7	20.2	29.4	35.7
Terminal Resistance	$R_{mt}$	$\Omega$	0.0700	0.120	0.260	0.480	1.04	1.60
Inductance	L	mH	0.26	0.49	1.1	2.0	4.2	6.2
Peak Current	$I_{pk}$	A	93	69	48	33	23	19
Electrical Time Constant	$\tau_e$	ms	3.7	4.1	4.0	4.1	4.0	3.9
Mechanical Time Constant	$\tau_m$	ms	2.2	2.0	2.1	2.0	2.1	2.2

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units						
Rated Voltage <b>V1</b>	$V_r$	V	76.0	96.0	121	152	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.3	1.3	1.4	1.4	1.4	1.6
		oz-in	180	190	190	200	190	230
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	24	19	17	12	9.7	6.9
Rated Power <sup>1</sup>	$P_r$	W	790	840	860	890	860	1000
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	1.4	1.1	0.92	0.64	0.52	0.32
Rated Voltage <b>V2</b>	$V_r$	V	38.0	96.0	96.0	76.0	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.3	1.3	1.4	1.6	1.4	1.8
		oz-in	180	190	190	220	200	250
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	5490	6000	5380
Rated Current <sup>1</sup>	$I_r$	A	24	19	17	13	9.7	7.4
Rated Power <sup>1</sup>	$P_r$	W	800	840	860	900	870	1000
No Load Speed	$\omega_{nl}$	rpm	5700	6000	6000	5260	6000	5280
No Load Current	$I_{nl}$	A	1.4	1.1	0.92	0.60	0.52	0.31
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.32	0.32	0.30	0.32	0.31	0.28
		oz-in/ $\sqrt{W}$	45	45	43	45	44	40
Torque Constant	$K_T$	Nm/A	0.0634	0.0845	0.0951	0.137	0.169	0.274
		oz-in/A	8.98	12.0	13.5	19.5	23.9	38.8
Voltage Constant	$K_E$	V/(rad/s)	0.0634	0.0845	0.0951	0.137	0.169	0.274
		V/krpm	6.64	8.85	9.96	14.4	17.7	28.7
Terminal Resistance	$R_{mt}$	$\Omega$	0.0400	0.0700	0.100	0.190	0.290	0.940
Inductance	L	mH	0.17	0.30	0.38	0.81	1.2	3.2
Peak Current	$I_{pk}$	A	120	90	78	57	45	29
Electrical Time Constant	$\tau_e$	ms	4.3	4.3	3.8	4.3	4.2	3.4
Mechanical Time Constant	$\tau_m$	ms	2.0	2.0	2.2	2.0	2.1	2.5

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.



Motor Data		Units							
Rated Voltage <b>V1</b>	$V_r$	V	76.0	76.0	152	152	305	305	305
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.4	1.4	1.3	1.3	1.3	1.3	1.3
		oz-in	190	200	190	190	190	190	180
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	6000	6000	6000	6000	6000
Rated Current <sup>1</sup>	$I_r$	A	28	24	10	8.5	6.8	5.2	3.4
Rated Power <sup>1</sup>	$P_r$	W	860	890	830	840	840	840	800
No Load Speed	$\omega_{nl}$	rpm	6000	6000	6000	6000	6000	6000	6000
No Load Current	$I_{nl}$	A	1.6	1.3	0.59	0.48	0.39	0.30	0.21
Rated Voltage <b>V2</b>	$V_r$	V	38.0	48.0	76.0	76.0	152	152	152
Rated Torque <sup>1</sup> •	$T_r$	Nm	1.4	1.4	1.6	1.8	1.4	1.6	1.9
		oz-in	200	200	230	260	190	230	270
Rated Speed <sup>1</sup>	$\omega_r$	rpm	6000	6000	4940	3900	6000	4920	3240
Rated Current <sup>1</sup>	$I_r$	A	28	24	12	11	6.8	6.2	4.8
Rated Power <sup>1</sup>	$P_r$	W	870	900	840	750	850	850	640
No Load Speed	$\omega_{nl}$	rpm	6000	6000	4740	3850	6000	4740	3270
No Load Current	$I_{nl}$	A	1.6	1.3	0.53	0.40	0.39	0.27	0.16
Motor Constant	$K_M$	Nm/ $\sqrt{W}$	0.29	0.32	0.33	0.32	0.32	0.32	0.31
		oz-in/ $\sqrt{W}$	42	45	46	45	45	46	44
Torque Constant	$K_T$	Nm/A	0.0588	0.0706	0.153	0.188	0.235	0.306	0.442
		oz-in/A	8.33	9.99	21.6	26.6	33.3	43.3	62.6
Voltage Constant	$K_E$	V/(rad/s)	0.0588	0.0706	0.153	0.188	0.235	0.306	0.442
		V/krpm	6.16	7.39	16.0	19.7	24.6	32.0	46.3
Terminal Resistance	$R_{mt}$	$\Omega$	0.0400	0.0500	0.220	0.350	0.540	0.900	2.06
Inductance	L	mH	0.13	0.19	0.91	1.4	2.2	3.6	7.8
Peak Current	$I_{pk}$	A	130	110	51	42	33	26	17
Electrical Time Constant	$\tau_e$	ms	3.3	3.8	4.1	3.9	4.0	4.0	3.8
Mechanical Time Constant	$\tau_m$	ms	2.7	2.4	2.2	2.4	2.3	2.3	2.5

<sup>1</sup>Recorded at maximum winding temperature at 25°C ambient and without heatsink.

