Shown with optional assemblies.

DC022C Series

The DC022C Series Brush Commutated DC Motor is a 22 mm diameter unit offered in 3 lengths with continuous output torques of 0.0056 to 0.0141 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 10,000 RPM possible
- DC bus voltage up to 36 VDC
- Eight standard windings, special windings available
- 2 pole stator with neodymium magnets
- 5 slot skewed rotor
- Sintered bronze bearings, ball bearings available
- Copper graphite brushes, RFI suppression available

Optional Assemblies

- Encoder: E21C/D
- Gearboxes: G22A, PLG24
- Programmable Drive: PBL4850E**

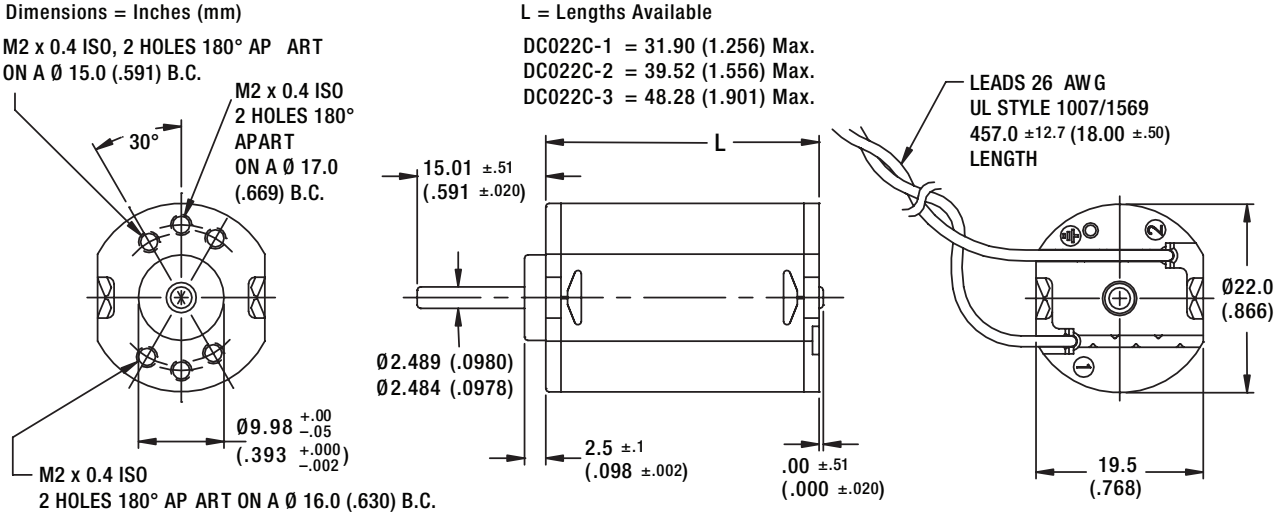
Motor Characteristics

Motor Data		Units	Part No. DC022C-1	DC022C-2	DC022C-3
Max DC Terminal Voltage	V_T	V	36		
Max Speed (Mechanical)	ω_{MAX}	rpm	10000		
Continuous Stall Torque[1]	T_{CS}	Nm	0.0057	0.0093	0.014
		oz-in	0.81	1.3	2.0
Peak Torque (Maximum)[1]	T_{pk}	Nm	0.018	0.037	0.066
		oz-in	2.6	5.3	9.3
Coulomb Friction Torque	T_f	Nm	9.2E-04	9.9E-04	0.0011
		oz-in	0.13	0.14	0.15
Viscous Damping Factor	D	Nm/(rad/s)	2.7E-07	3.4E-07	4.0E-07
		oz-in/krpm	0.0040	0.0050	0.0060
Thermal Time Constant	τ_{th}	min	9.9	11	13
Thermal Resistance	R_{th}	°C/W	38	29	22
Max. Winding Temperature	Θ_{MAX}	°C	130	130	130
Rotor Inertia	J_r	kg-m²	5.2E-07	6.8E-07	8.1E-07
		oz-in-s²	7.3E-05	9.6E-05	1.1E-04
Motor Weight	W_m	g	43	60	75
		oz	1.5	2.1	2.7

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

Dimensional Drawings: DC022C-1 • DC022C-2 • DC022C-3

Dimensions = Inches (mm)

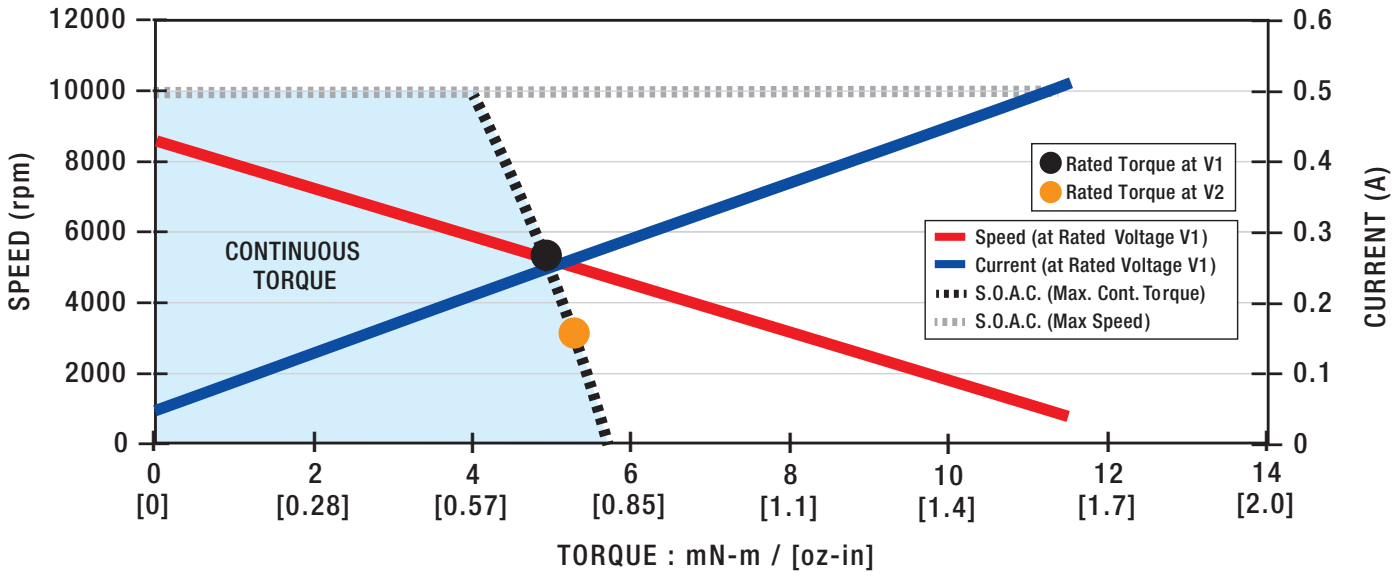


NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only.

Performance Data & Graph: **DC022C–1**

Motor Data		Units								
Rated Voltage **V1**	V_r	V	6.00	7.58	9.55	12.0	15.2	19.1	24.0	30.3
Rated Torque[1] •	T_r	Nm	0.0049	0.0049	0.0050	0.0050	0.0049	0.0049	0.0049	0.0050
		oz-in	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.71
Rated Speed[1]	ω_r	rpm	5270	5240	5190	5160	5220	5300	5270	5080
Rated Current[1]	I_r	A	0.98	0.78	0.62	0.50	0.39	0.31	0.25	0.20
Rated Power[1]	P_r	W	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
No Load Speed	ω_{nl}	rpm	8240	8270	8260	8260	8290	8280	8270	8250
No Load Current	I_{nl}	A	0.18	0.14	0.12	0.089	0.070	0.056	0.044	0.035
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	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
		oz-in	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Rated Speed[1]	ω_r	rpm	3160	3060	3050	3040	3020	3170	3140	2920
Rated Current[1]	I_r	A	1.0	0.82	0.65	0.52	0.41	0.33	0.26	0.21
Rated Power[1]	P_r	W	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.6
No Load Speed	ω_{nl}	rpm	6480	6470	6480	6490	6460	6510	6500	6450
No Load Current	I_{nl}	A	0.17	0.14	0.11	0.085	0.067	0.053	0.043	0.034
Motor Constant	K_M	Nm/√W	0.0048	0.0047	0.0047	0.0047	0.0047	0.0048	0.0048	0.0047
		oz-in/√W	0.67	0.67	0.67	0.66	0.67	0.67	0.67	0.66
Torque Constant	K_T	Nm/A	0.00657	0.00826	0.0104	0.0131	0.0165	0.0208	0.0262	0.0330
		oz-in/A	0.930	1.17	1.47	1.85	2.34	2.95	3.71	4.68
Voltage Constant	K_E	V/(rad/s)	0.00657	0.00826	0.0104	0.0131	0.0165	0.0208	0.0262	0.0330
		V/krpm	0.688	0.865	1.09	1.37	1.73	2.18	2.74	3.46
Terminal Resistance	R_{mt}	Ω	1.90	3.05	4.88	7.75	12.3	19.1	30.4	50.2
Inductance	L	mH	1.0	1.6	2.6	4.1	6.5	10	16	26
Peak Current	I_{pk}	A	3.2	2.5	2.0	1.5	1.2	1.0	0.79	0.60
Electrical Time Constant	τ_e	ms	0.53	0.53	0.53	0.52	0.53	0.54	0.53	0.52
Mechanical Time Constant	τ_m	ms	23	23	23	23	23	23	23	24

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

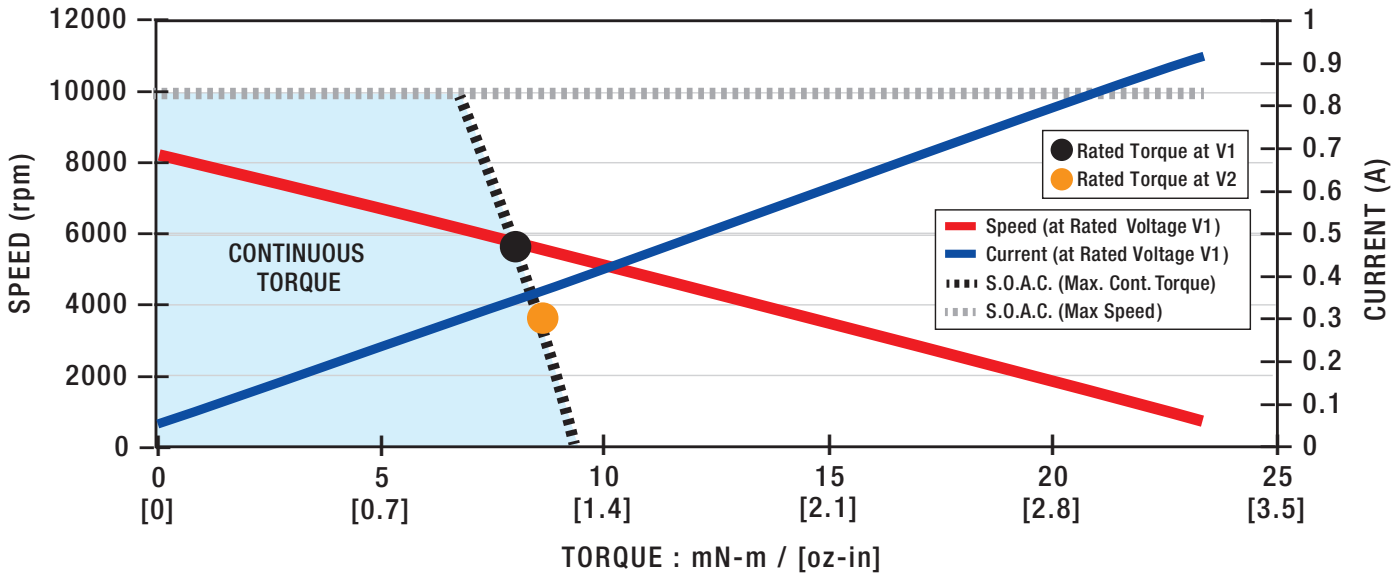


NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only. S.O.A.C. = Safe Operating Area for Continuous duty.

Performance Data & Graph: **DC022C–2**

Motor Data		Units								
Rated Voltage **V1**	V_r	V	6.00	7.58	9.55	12.0	15.2	19.1	24.0	30.3
Rated Torque[1] •	T_r	Nm	0.0086	0.0085	0.0084	0.0081	0.0081	0.0081	0.0081	0.0080
		oz-in	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1
Rated Speed[1]	ω_r	rpm	4330	4780	4880	5680	5650	5610	5640	5690
Rated Current[1]	I_r	A	1.5	1.1	0.90	0.70	0.55	0.44	0.35	0.27
Rated Power[1]	P_r	W	3.9	4.2	4.3	4.8	4.8	4.7	4.8	4.8
No Load Speed	ω_{nl}	rpm	7770	7700	7660	7800	7750	7740	7780	7750
No Load Current	I_{nl}	A	0.18	0.14	0.12	0.090	0.070	0.056	0.045	0.035
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	0.0090	0.0088	0.0088	0.0085	0.0085	0.0085	0.0085	0.0085
		oz-in	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
Rated Speed[1]	ω_r	rpm	2430	2850	2980	3780	3700	3720	3750	3770
Rated Current[1]	I_r	A	1.5	1.2	0.93	0.73	0.57	0.46	0.36	0.29
Rated Power[1]	P_r	W	2.3	2.6	2.7	3.4	3.3	3.3	3.4	3.4
No Load Speed	ω_{nl}	rpm	6140	6040	6030	6170	6080	6120	6150	6100
No Load Current	I_{nl}	A	0.18	0.14	0.11	0.086	0.067	0.053	0.043	0.034
Motor Constant	K_M	Nm/√W	0.0059	0.0063	0.0064	0.0069	0.0070	0.0069	0.0069	0.0070
		oz-in/√W	0.83	0.89	0.90	0.98	0.99	0.98	0.98	1.0
Torque Constant	K_T	Nm/A	0.00706	0.00904	0.0115	0.0142	0.0181	0.0228	0.0286	0.0362
		oz-in/A	0.999	1.28	1.62	2.01	2.57	3.23	4.04	5.13
Voltage Constant	K_E	V/(rad/s)	0.00706	0.00904	0.0115	0.0142	0.0181	0.0228	0.0286	0.0362
		V/krpm	0.739	0.947	1.20	1.49	1.90	2.39	2.99	3.79
Terminal Resistance	R_{mt}	Ω	1.44	2.09	3.24	4.19	6.76	10.8	16.9	26.5
Inductance	L	mH	0.67	1.1	1.8	2.8	4.5	7.1	11	18
Peak Current	I_{pk}	A	4.2	3.6	2.9	2.9	2.2	1.8	1.4	1.1
Electrical Time Constant	τ_e	ms	0.47	0.53	0.55	0.66	0.66	0.66	0.65	0.67
Mechanical Time Constant	τ_m	ms	20	17	17	14	14	14	14	14

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

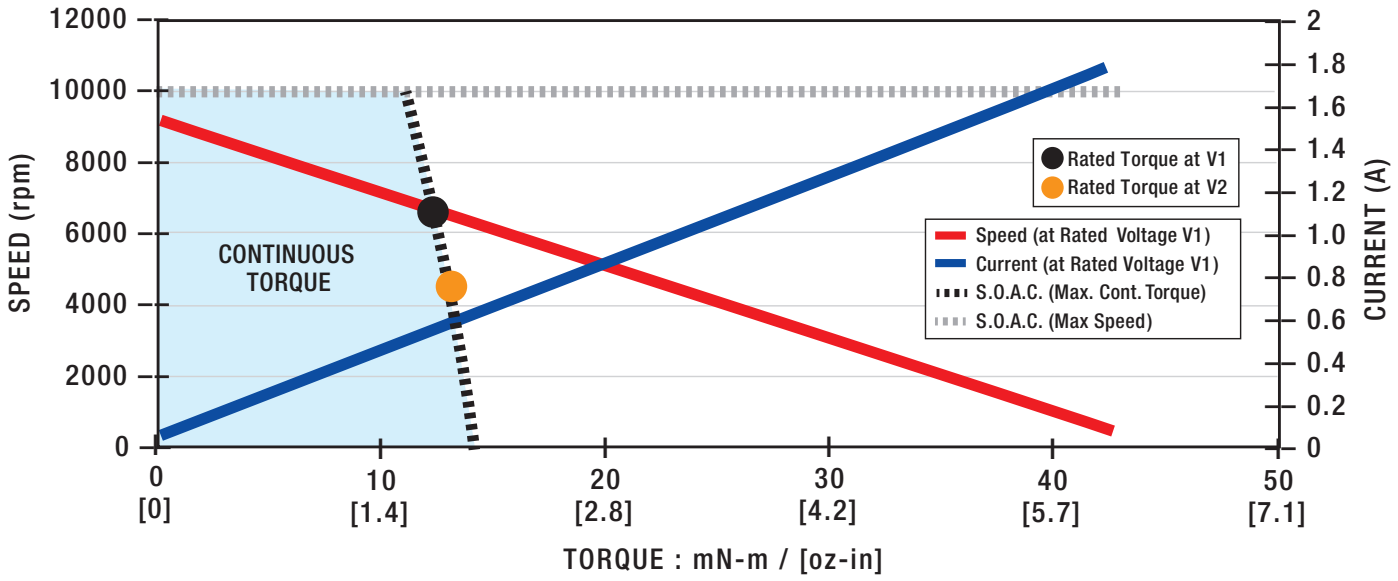


NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only. S.O.A.C. = Safe Operating Area for Continuous duty.

Performance Data & Graph: **DC022C–3**

Motor Data		Units								
Rated Voltage **V1**	V_r	V	6.00	7.58	9.55	12.0	15.2	19.1	24.0	30.3
Rated Torque[1] •	T_r	Nm	0.013	0.013	0.013	0.013	0.012	0.012	0.012	0.012
		oz-in	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7
Rated Speed[1]	ω_r	rpm	5740	5500	5980	6160	6490	6620	6610	6670
Rated Current[1]	I_r	A	2.3	1.9	1.5	1.1	0.90	0.71	0.56	0.45
Rated Power[1]	P_r	W	7.7	7.5	8.1	8.2	8.5	8.6	8.5	8.6
No Load Speed	ω_{nl}	rpm	8500	8810	8780	8500	8600	8620	8550	8580
No Load Current	I_{nl}	A	0.22	0.18	0.15	0.11	0.087	0.069	0.055	0.044
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	0.013	0.014	0.013	0.013	0.013	0.013	0.013	0.013
		oz-in	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8
Rated Speed[1]	ω_r	rpm	3730	3350	3870	4140	4380	4570	4580	4600
Rated Current[1]	I_r	A	2.4	2.0	1.6	1.2	0.93	0.74	0.58	0.46
Rated Power[1]	P_r	W	5.2	4.8	5.4	5.7	6.0	6.2	6.2	6.2
No Load Speed	ω_{nl}	rpm	6740	6930	6930	6730	6760	6830	6780	6770
No Load Current	I_{nl}	A	0.21	0.17	0.14	0.11	0.082	0.066	0.052	0.041
Motor Constant	K_M	Nm/√W	0.0078	0.0073	0.0077	0.0083	0.0085	0.0086	0.0088	0.0088
		oz-in/√W	1.1	1.0	1.1	1.2	1.2	1.2	1.2	1.2
Torque Constant	K_T	Nm/A	0.00657	0.00798	0.0101	0.0132	0.0165	0.0207	0.0263	0.0330
		oz-in/A	0.930	1.13	1.43	1.87	2.34	2.93	3.72	4.68
Voltage Constant	K_E	V/(rad/s)	0.00657	0.00798	0.0101	0.0132	0.0165	0.0207	0.0263	0.0330
		V/krpm	0.688	0.836	1.06	1.38	1.73	2.17	2.75	3.46
Terminal Resistance	R_{mt}	Ω	0.710	1.21	1.72	2.55	3.76	5.73	9.00	14.1
Inductance	L	mH	0.29	0.44	0.71	1.2	1.9	2.9	4.7	7.5
Peak Current	I_{pk}	A	8.5	6.3	5.6	4.7	4.0	3.3	2.7	2.1
Electrical Time Constant	τ_e	ms	0.41	0.36	0.41	0.46	0.50	0.51	0.52	0.53
Mechanical Time Constant	τ_m	ms	13	15	14	12	11	11	10	10

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



NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only. S.O.A.C. = Safe Operating Area for Continuous duty.

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