PITTMAN
AMETEK

PLEASE NOTE: This is a legacy product, meant to provide reference data and is not intended for new machine designs. Please consider alternative HKP product for new machine designs.

EA057A Series

The EA057A Series Brushless DC Motor is a high torque model brushless motor designed in a NEMA 23 package with an IP-65 rating. It is offered in 4 motor lengths with continuous torque from 0.47 – 1.70 Nm.

EA Automation Grade Motors For applications that require feedback connectivity to other machinery components. IP-65 Rated

Benefits

- Speeds up to 6,000 RPM possible
- DC bus voltage up to 325 VDC
- NEMA 23 package
- Five standard windings
- 4 pole rare earth design

Optional Assemblies

- Encoders: V, D Types
- Programmable Drives: BE6015A, BGE6060A

Motor Characteristics

Motor Data		Units	Part No.			
			EA057A-1	EA057A-2	EA057A-3	EA057A-4
Max DC Terminal Voltage	V_T	V	325			
Max Speed (Mechanical)	ω_{MAX}	rpm	6000			
Continuous Stall Torque[1]	T_{CS}	Nm	0.47	0.82	1.3	1.7
		lb-in	66	120	180	250
Peak Torque (Maximum)[1]	T_{pk}	Nm	1.5	2.6	4.0	5.3
		lb-in	210	370	570	750
Coulomb Friction Torque	T_f	Nm	0.027	0.078	0.038	0.050
		oz-in	3.8	4.6	5.4	7.1
Viscous Damping Factor	D	Nm/(rad/s)	2.7E-05	6.7E-06	3.4E-05	8.1E-05
		oz-in/krpm	0.40	0.10	0.50	1.2
Thermal Time Constant	τ_{th}	min	10	10	10	10
Thermal Resistance	R_{th}	°C/W	1.8	1.6	1.0	0.93
Max. Winding Temperature	Θ_{MAX}	°C	125	125	125	125
Rotor Inertia	J_r	kg-m^2	1.6E-05	2.9E-05	4.2E-05	5.6E-05
		lb-in-s^2	0.0022	0.0041	0.0059	0.0080
Motor Weight	W_m	g	1200	1600	2100	2400
		oz	43	57	74	86

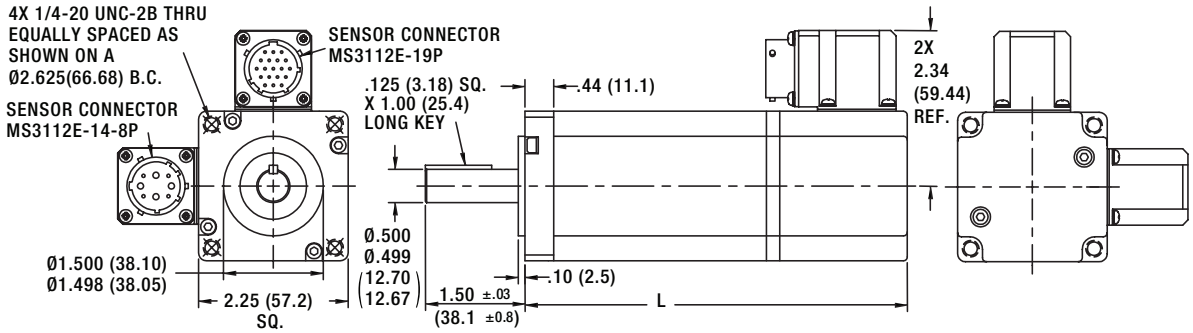
[1]Recorded at maximum winding temperature at 25°C ambient and without heatsink. **For PBL4850E to operate a brush motor, an encoder is required.

Dimensional Drawings: EA057A-1 • EA057A-2 • EA057A-3 • EA057A-4

Dimensions = inches (mm)

L = Lengths Available

EA057A-1 = 4.75±.06 (120.7) ±1.5
EA057A-2 = 5.75±.06 (146.1) ±1.5
EA057A-3 = 6.75±.06 (171.5) ±1.5
EA057A-4 = 7.75±.06 (196.9) ±1.5



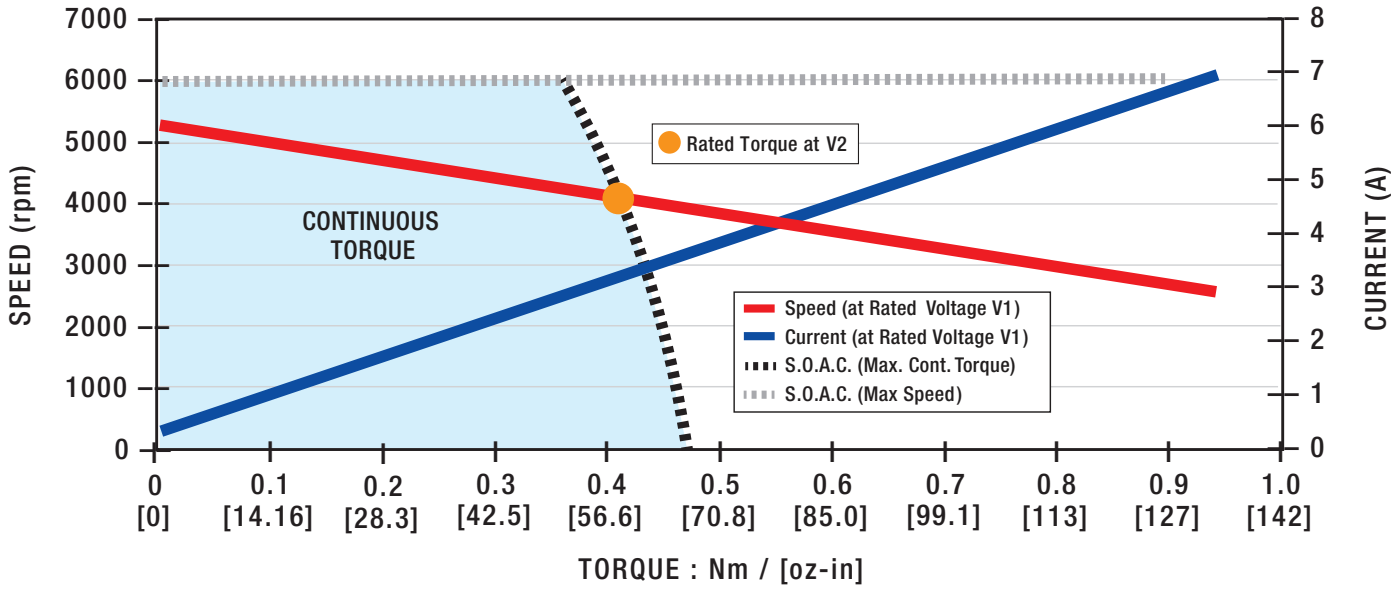
NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only.

Performance Data & Graph: **EA057A–1**

EC

Motor Data		Units					
Rated Voltage **V1**	V_r	V	76.0	76.0	152	152	305
Rated Torque[1] •	T_r	Nm	0.35	0.35	0.35	0.36	0.34
		oz-in	50	50	50	50	49
Rated Speed[1]	ω_r	rpm	6000	5950	6000	6000	6000
Rated Current[1]	I_r	A	5.5	3.9	2.9	2.3	1.9
Rated Power[1]	P_r	W	220	220	220	220	220
No Load Speed	ω_{nl}	rpm	6000	6000	6000	6000	6000
No Load Current	I_{nl}	A	0.55	0.39	0.29	0.23	0.19
Rated Voltage **V2**	V_r	V	38.0	48.0	76.0	76.0	152
Rated Torque[1] •	T_r	Nm	0.42	0.42	0.41	0.44	0.36
		oz-in	59	60	58	62	51
Rated Speed[1]	ω_r	rpm	3760	3180	3990	2860	5740
Rated Current[1]	I_r	A	6.3	4.5	3.2	2.7	1.9
Rated Power[1]	P_r	W	160	140	170	130	210
No Load Speed	ω_{nl}	rpm	4450	3960	4650	3680	6000
No Load Current	I_{nl}	A	0.50	0.34	0.27	0.20	0.19
Motor Constant	K_M	Nm/√W	0.079	0.077	0.078	0.079	0.077
		oz-in/√W	11	11	11	11	11
Torque Constant	K_T	Nm/A	0.0802	0.114	0.154	0.194	0.234
		oz-in/A	11.4	16.1	21.8	27.5	33.1
Voltage Constant	K_E	V/(rad/s)	0.0802	0.114	0.154	0.194	0.234
		V/krpm	8.40	11.9	16.1	20.3	24.5
Terminal Resistance	R_{mt}	Ω	1.05	2.16	3.85	6.07	9.16
Inductance	L	mH	0.90	1.8	3.3	5.3	7.7
Peak Current	I_{pk}	A	21	15	11	8.7	7.2
Electrical Time Constant	τ_e	ms	0.86	0.84	0.86	0.87	0.84
Mechanical Time Constant	τ_m	ms	2.6	2.6	2.6	2.5	2.6

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



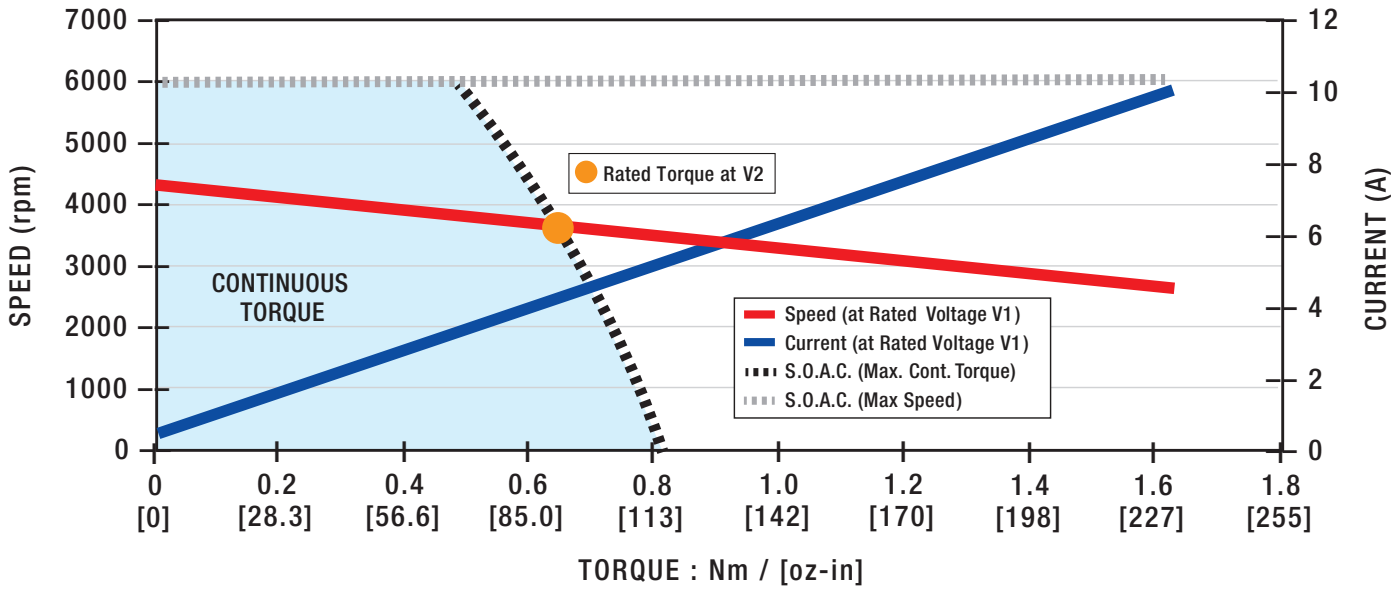
NOTE: All values specified at 25°C ambient temperature. Peak values are theoretical and for reference only. S.O.A.C. = Safe Operating Area for Continuous duty.

Performance Data & Graph: **EA057A–2**

EC

Motor Data		Units					
Rated Voltage **V1**	V_r	V	76.0	76.0	152	152	305
Rated Torque[1] •	T_r	Nm	0.48	0.48	0.48	0.46	0.48
		oz-in	68	68	68	65	68
Rated Speed[1]	ω_r	rpm	6000	6000	6000	6000	6000
Rated Current[1]	I_r	A	6.7	5.2	3.4	2.7	1.7
Rated Power[1]	P_r	W	300	300	300	290	300
No Load Speed	ω_{nl}	rpm	6000	5980	6000	6000	6000
No Load Current	I_{nl}	A	0.88	0.69	0.44	0.37	0.22
Rated Voltage **V2**	V_r	V	38.0	48.0	76.0	76.0	152
Rated Torque[1] •	T_r	Nm	0.65	0.65	0.65	0.68	0.66
		oz-in	92	93	92	96	93
Rated Speed[1]	ω_r	rpm	3600	3530	3600	2790	3600
Rated Current[1]	I_r	A	8.7	6.8	4.3	3.7	2.2
Rated Power[1]	P_r	W	240	240	240	200	250
No Load Speed	ω_{nl}	rpm	3820	3760	3820	3140	3820
No Load Current	I_{nl}	A	0.87	0.68	0.44	0.36	0.22
Motor Constant	K_M	Nm/√W	0.13	0.13	0.13	0.13	0.13
		oz-in/√W	19	19	19	18	19
Torque Constant	K_T	Nm/A	0.0936	0.120	0.187	0.227	0.374
		oz-in/A	13.3	17.0	26.5	32.2	53.0
Voltage Constant	K_E	V/(rad/s)	0.0936	0.120	0.187	0.227	0.374
		V/krpm	9.80	12.6	19.6	23.8	39.2
Terminal Resistance	R_{mt}	Ω	0.510	0.830	2.04	3.10	8.01
Inductance	L	mH	0.52	0.86	2.1	3.1	8.4
Peak Current	I_{pk}	A	33	26	16	13	8.1
Electrical Time Constant	τ_e	ms	1.0	1.0	1.0	1.0	1.0
Mechanical Time Constant	τ_m	ms	1.7	1.7	1.7	1.7	1.7

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



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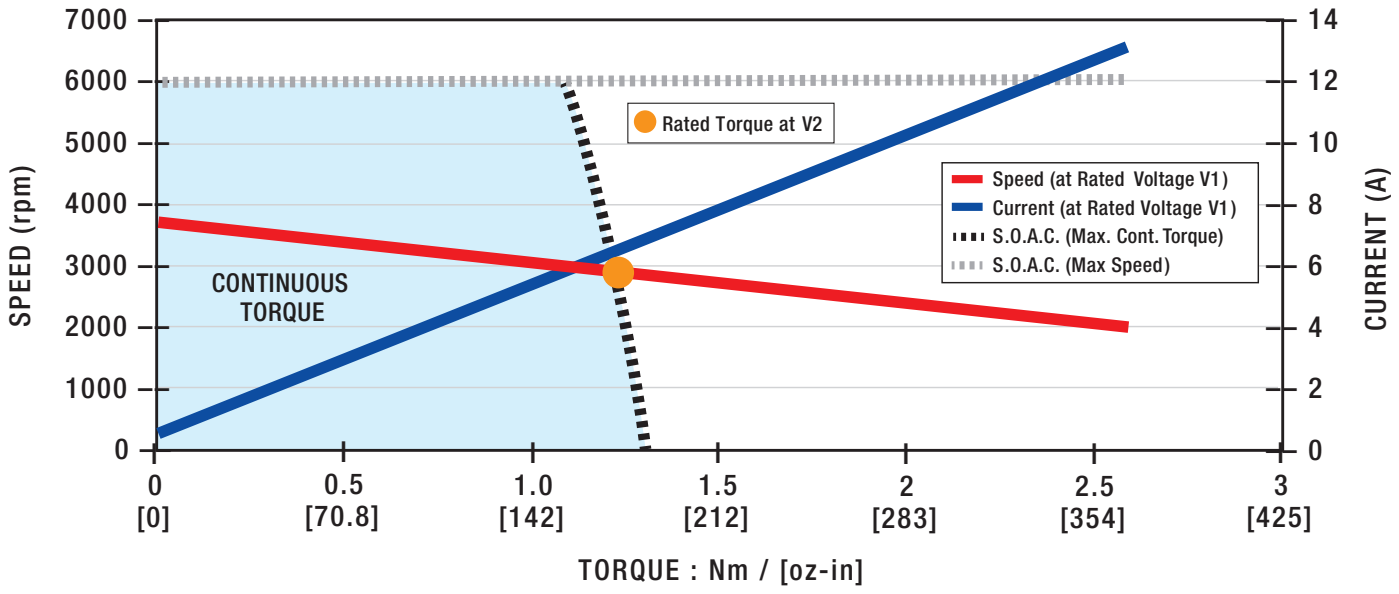
Performance Data & Graph: **EA057A–3**

EC

Motor Data		Units					
Rated Voltage **V1**	V_r	V	76.0	152	152	305	305
Rated Torque[1] •	T_r	Nm	1.0	1.1	1.1	1.0	1.0
		oz-in	140	150	150	150	150
Rated Speed[1]	ω_r	rpm	6000	6000	6000	6000	4990
Rated Current[1]	I_r	A	12	7.0	5.7	3.8	2.2
Rated Power[1]	P_r	W	640	670	670	650	540
No Load Speed	ω_{nl}	rpm	6000	6000	6000	6000	5160
No Load Current	I_{nl}	A	0.60	0.33	0.27	0.19	0.11
Rated Voltage **V2**	V_r	V	48.0	76.0	76.0	152	152
Rated Torque[1] •	T_r	Nm	1.1	1.2	1.2	1.1	1.2
		oz-in	160	170	170	160	160
Rated Speed[1]	ω_r	rpm	4320	3710	2880	4270	2020
Rated Current[1]	I_r	A	13	7.7	6.4	4.1	2.4
Rated Power[1]	P_r	W	510	470	370	510	240
No Load Speed	ω_{nl}	rpm	4550	4000	3270	4500	2560
No Load Current	I_{nl}	A	0.54	0.29	0.23	0.17	0.084
Motor Constant	K_M	Nm/√W	0.16	0.17	0.17	0.16	0.15
		oz-in/√W	23	24	23	23	22
Torque Constant	K_T	Nm/A	0.100	0.180	0.221	0.321	0.561
		oz-in/A	14.2	25.6	31.2	45.4	79.5
Voltage Constant	K_E	V/(rad/s)	0.100	0.180	0.221	0.321	0.561
		V/krpm	10.5	18.9	23.1	33.6	58.8
Terminal Resistance	R_{mt}	Ω	0.390	1.16	1.77	3.94	13.5
Inductance	L	mH	0.37	1.2	1.8	3.9	12
Peak Current	I_{pk}	A	45	26	21	14	7.5
Electrical Time Constant	τ_e	ms	0.95	1.0	1.0	0.98	0.87
Mechanical Time Constant	τ_m	ms	1.6	1.5	1.5	1.6	1.8

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



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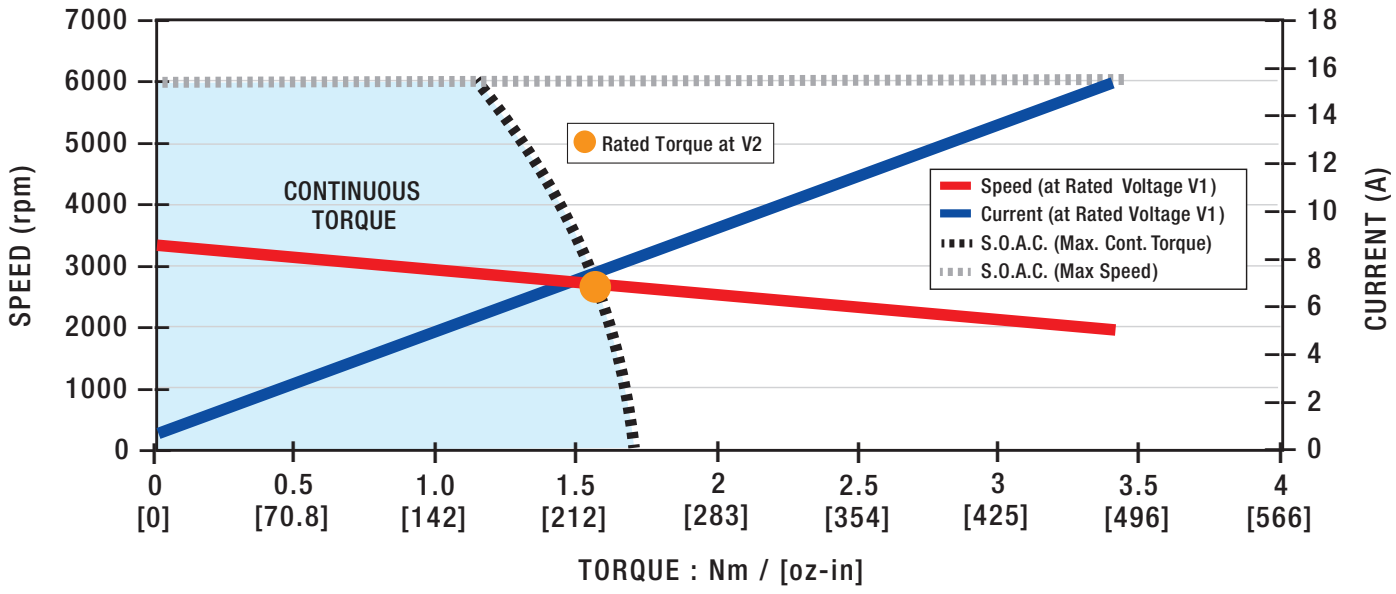
Motor Data		Units					
Rated Voltage **V1**	V_r	V	76.0	152	152	305	305
Rated Torque[1] •	T_r	Nm	1.3	1.1	1.1	1.1	1.1
		oz-in	180	160	160	160	150
Rated Speed[1]	ω_r	rpm	5430	6000	6000	6000	6000
Rated Current[1]	I_r	A	11	7.0	5.5	3.5	2.8
Rated Power[1]	P_r	W	710	690	700	700	670
No Load Speed	ω_{nl}	rpm	5290	6000	5850	6000	6000
No Load Current	I_{nl}	A	0.70	0.53	0.41	0.27	0.23
Rated Voltage **V2**	V_r	V	48.0	76.0	76.0	152	170
Rated Torque[1] •	T_r	Nm	1.6	1.5	1.6	1.5	1.4
		oz-in	220	210	220	210	200
Rated Speed[1]	ω_r	rpm	3160	3630	2670	3630	3360
Rated Current[1]	I_r	A	13	8.9	7.3	4.4	3.7
Rated Power[1]	P_r	W	510	550	440	550	500
No Load Speed	ω_{nl}	rpm	3340	3760	2920	3760	3550
No Load Current	I_{nl}	A	0.58	0.43	0.31	0.22	0.18
Motor Constant	K_M	Nm/√W	0.22	0.21	0.22	0.21	0.21
		oz-in/√W	31	30	30	30	29
Torque Constant	K_T	Nm/A	0.137	0.192	0.247	0.384	0.455
		oz-in/A	19.3	27.2	34.9	54.4	64.4
Voltage Constant	K_E	V/(rad/s)	0.137	0.192	0.247	0.384	0.455
		V/krpm	14.3	20.1	25.8	40.2	47.6
Terminal Resistance	R_{mt}	Ω	0.380	0.800	1.31	3.20	4.87
Inductance	L	mH	0.61	1.2	2.0	4.8	7.1
Peak Current	I_{pk}	A	45	30	24	16	13
Electrical Time Constant	τ_e	ms	1.6	1.5	1.5	1.5	1.5
Mechanical Time Constant	τ_m	ms	1.1	1.2	1.2	1.2	1.3

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



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