



 **DANAHER**
MOTION
Helping you build a better machine, faster.

EKM Series Motors

For Aerospace & Defense Applications

KOLLMORGEN™



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Introduction

Kollmorgen - Serving the Aerospace and Defense Industry

By combining industry-leading brands, Danaher Corporation established a customer focused motion control manufacturer known as Danaher Motion. Dedicated to making it easy for a customer to benefit from a broad range of technology and experience Danaher Motion serves the aerospace and defense industry through the Kollmorgen brand.

The Kollmorgen team provides aerospace and defense customers with high standards of quality, innovation and technology to improve a machine's performance and reliability. In addition, Danaher Motion's global manufacturing footprint, rapid customization and prototyping capabilities drive quick lead times which empowers Kollmorgen's customers to commission their machines faster.

Kollmorgen also offers the aerospace and defense industry unparalleled depth and breadth of motion control product solutions through a worldwide service and support infrastructure made up of field service engineers and support teams that are available when and where customers need them.

Kollmorgen and the Danaher Business System

Established with the intent to continually improve operations and bring increasing value to customers, the Danaher Business System (DBS) helps improve the efficiency of manufacturing and product development processes. DBS is a team approach based on the principles of Kaizen that continuously and aggressively eliminates waste in every aspect of business operations. DBS focuses the entire organization on achieving breakthrough results that create competitive advantages in quality, delivery and performance – advantages that are passed on to the customer. Through these advantages Kollmorgen is able serve the aerospace and defense customer with faster times to market as well as unsurpassed product selection, service, reliability and productivity.



Clutches & Brakes



Ball Screws



Lead Screws



Actuators



Brush DC Miniature Motors



Direct Drive Motors



Brushless Motors



Gearheads



Resolvers

Introduction to the EKM Motor Series

Enhanced, High-Performance, Brushless AC Servo motors

EKM Series Motors are Mil-Spec 810E rated and IP67 sealed for duty in harsh environmental conditions.

- Industry leading power and torque density
- Meets IP67 sealing requirements and is 100% leak-tested housing for further moisture blocking
- Ideal for most military specifications
- C.O.T.S (commercial off the shelf) solution
- Standard product offering with customization available

Torque

Offers 0.43 to 53 N-m continuous stall torque (3.8 to 467 lb in).

Speed

Speeds up to 8000 rpm meet high speed application requirements while the windings can be specifically tailored to lower speeds as well.

Voltage

EKM Series Motors feature 480 VAC High Voltage Insulation.

Feedback

Rugged Resolver feedback can survive the most extreme environments.

Friction Torque

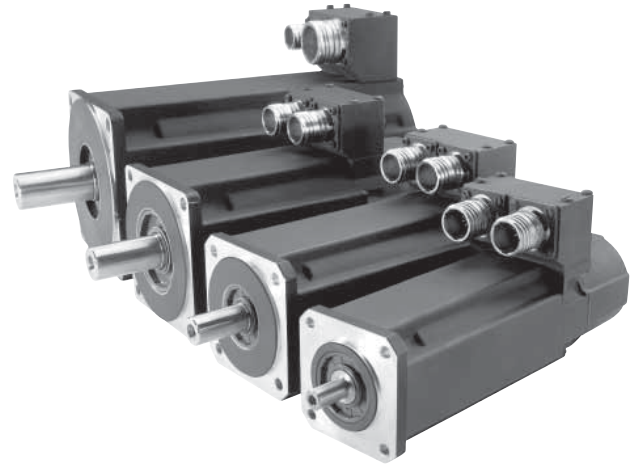
Low-cog, low harmonic distortion magnetic designs.

Connectivity

High performance nickel-plated MIL-C-38999 connectors with total environmental sealing, quick mating, triple lead threaded, self-locking coupling, as well as EMI and RFI shielding. In addition, both front-facing and rear-facing options are available.

Thermal

EKM Series Motors are rated for operation over a temperature range of -51°C to 54°C and feature 155°C (class F) insulation materials which include a thermistor.



Corrosion

Stainless steel shaft and fasteners prevent external corrosion while a chemical agent resistant paint allows resistance to harsh outdoor environments and chemicals.

Sealing

IP67 rated for ingress prevention and brief submergence as well as 100-psi wash down. In addition, a viton shaft seal comes standard.

Shock

Tested per MIL-STD-810E, Method 516.4, Procedure 1, 75g half sine wave pulses for 11 ms, 3 times in each axis (total of 18 shocks).

Vibration

Tested per MIL-STD-810E, Method 514.4, Procedure 1, Operational 0.01g²/Hz 5-30Hz, 0.02g²/Hz 75-500Hz, 0.006g²/Hz 900-2000 Hz.

Mounting

International Standard Mount available.

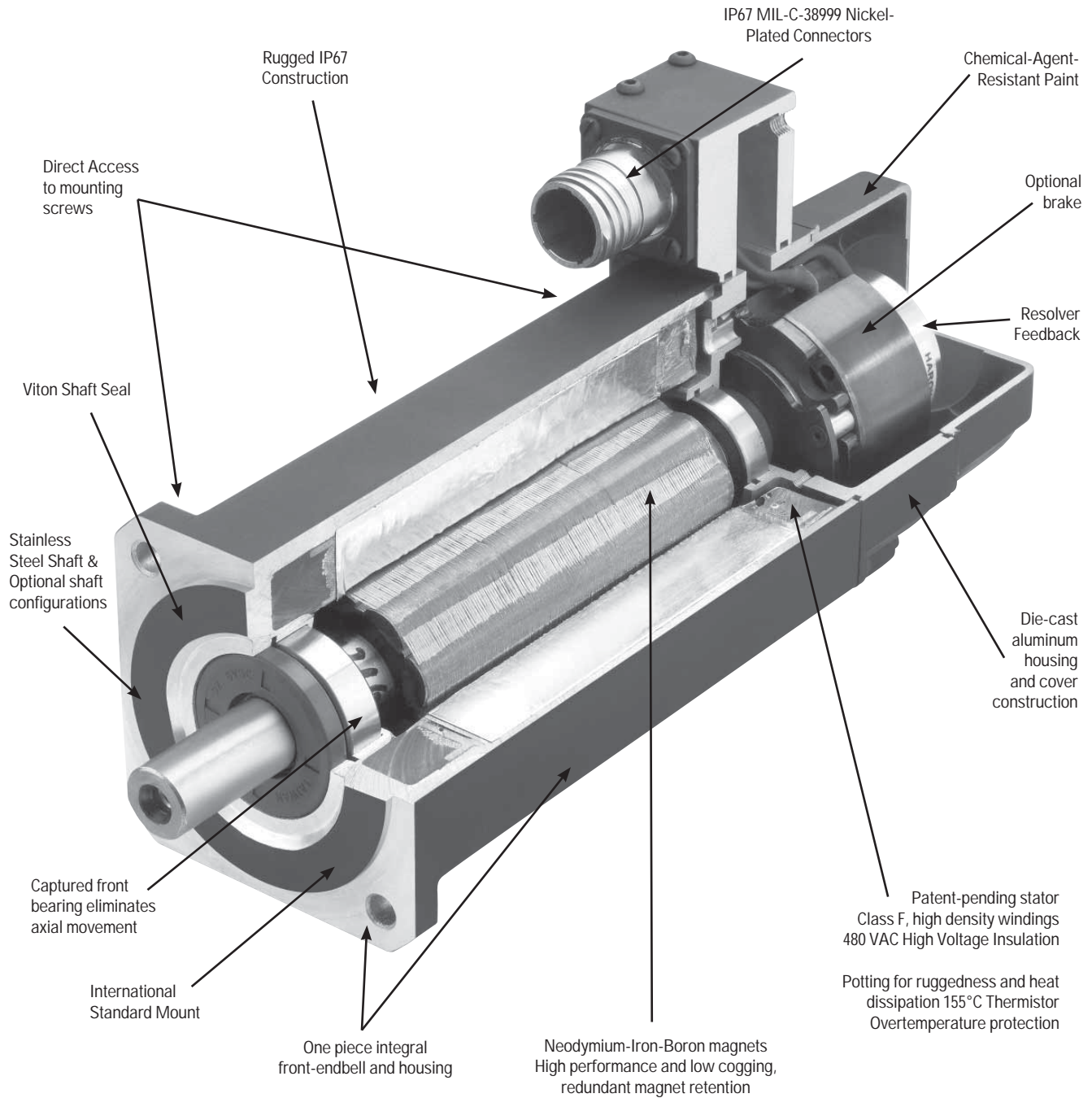
Options

Additional motion control solutions are available with these options:

- Fail-safe brakes
- Shaft variations
- Custom windings

Advanced Motor Design Features

The enhanced EKM motor series is Mil-Spec 810E rated, IP67 sealed, and comes standard with a stainless steel shaft and chemical-agent-resistant paint.

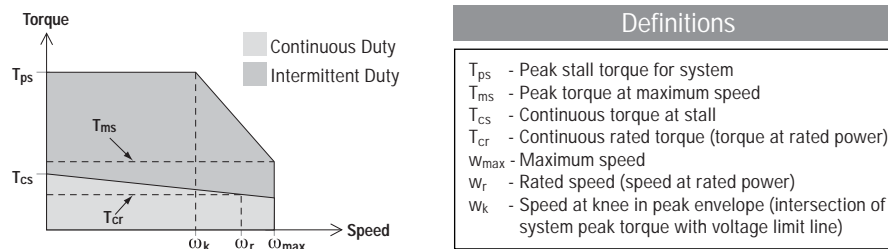


Note: The EKM Series is not CE compliant.

System Overview

How To Build A Servo Drive & Motor System

System torque/speed information on the following pages is designed to help you select the optimum brushless servomotor/controller combination. The nominal values in this data illustrate performance for the recommended motor/controller systems.



Drive & Motor Performance Curves

The performance characteristics of a brushless servo system (motor/controller combination) are described by a torque/speed operating envelope. As shown above, the shaded areas of the curve indicate the continuous duty and intermittent duty zones of the system.

Continuous Duty Zone

The continuous duty zone is bordered by the maximum continuous torque line up to the intersection with the intermittent duty line. The continuous torque line is set by either the motor's maximum rated temperature, or the controller's rated continuous current output, whichever is less. The system voltage line is set by the voltage rating of the controller, the line voltage supplied, and the motor winding. The system can operate on a continuous basis anywhere within this area, assuming the ambient temperature is 40°C or less. Refer to the Test Conditions on the pages that follow.

Intermittent Duty Zone

The intermittent duty zone is bordered by the peak torque line and the system voltage line. The peak torque line is set by either the controller's peak current rating, which the controller can produce for a limited time, or the maximum rated peak current for the motor, whichever is less. Refer to the Rating Data on the pages that follow. NOTE: higher torque levels may be achievable at higher power levels.

Consult Danaher Motion Customer Support for more details. The system voltage line is set by the voltage rating of the controller, the line voltage applied and the motor winding. Operation in the intermittent zone must be limited to a duty cycle that will produce an RMS system torque falling within the continuous duty area. The RMS torque value is a function of the magnitude of the intermittent torque and the percentage of the time spent at that torque.

Zero - Peak, or RMS?

Current brushless drive technology uses a sinusoidal output. Danaher Motion rates its systems using RMS values to accurately reflect system performance operating with a sinusoidal waveform.

System Overview

Motor Performance, 240 VAC, 320 VDC bus, assuming Sinusoidal Commutation ①

Motor Model	Peak Stall Torque T _{ps} ② N-m (lb-in)	Peak Torque at Max. Speed T _{ms} N-m (lb-in)	Cont. Stall Torque T _{cs} N-m (lb-in)	Cont. Rated Torque T _{cr} N-m (lb-in)	Speed at Knee ω _k rpm	Rated Speed ω _r rpm	Max. Speed ω _{max} rpm	Cont. Stall Current I _{cs} A _{rms}	Current at Peak Torque I _{ps} A _{rms}
EKM21C	1.42 (12.6)	0.70 (6.22)	0.43 (3.57)	0.34 (3.02)	4,210	8,000	8,000	1.58	6.30
EKM22C	2.68 (23.7)	0.0 (0.0)	0.79 (7.02)	0.73 (6.49)	1,810	3,500	5,620	1.39	5.60
EKM22E	2.71 (24.0)	1.56 (13.8)	0.82 (7.28)	0.65 (5.77)	5,160	8,000	8,000	2.73	10.9
EKM23C	3.72 (32.9)	0.0 (0.0)	1.08 (9.58)	1.03 (9.12)	1,330	2,500	4,250	1.41	5.60
EKM23D	3.79 (33.5)	0.0 (0.0)	1.11 (9.84)	0.98 (8.69)	2,950	5,000	6,520	2.19	8.80
EKM23F	3.83 (33.9)	3.23 (28.6)	1.13 (10.0)	0.89 (7.89)	6,910	8,000	8,000	4.31	17.2
EKM24C	4.68 (41.4)	0.0 (0.0)	1.33 (11.8)	1.27 (11.27)	1,170	2,000	3,530	1.42	5.70
EKM24D	4.71 (41.7)	0.0 (0.0)	1.36 (12.0)	1.24 (11.0)	2,520	4,000	5,410	2.21	8.80
EKM24F	4.77 (42.2)	2.37 (21.0)	1.37 (12.1)	1.07 (9.49)	5,420	8,000	8,000	3.89	15.6
EKM31C	3.83 (33.9)	0.0 (0.0)	1.10 (9.76)	1.07 (9.47)	1,220	2,500	4,040	1.37	5.50
EKM31E	3.95 (34.9)	0.72 (6.39)	1.15 (10.2)	0.90 (7.98)	3,970	6,000	8,000	2.99	12.0
EKM32C	6.87 (60.8)	0.0 (0.0)	1.95 (17.3)	1.90 (16.8)	623	1,500	2,460	1.44	5.70
EKM32D	7.00 (61.9)	0.0 (0.0)	1.99 (17.6)	1.88 (16.7)	1,580	2,500	3,750	2.23	8.90
EKM32H	7.21 (63.8)	2.82 (25.0)	2.05 (18.2)	1.40 (12.4)	5,210	7,000	8,000	5.50	22.0
EKM33C	9.71 (85.9)	0.0 (0.0)	2.66 (23.6)	2.59 (22.9)	291	1,000	1,840	1.47	5.90
EKM33E	9.91 (87.6)	0.0 (0.0)	2.74 (24.3)	2.57 (22.8)	1,360	2,000	3,130	2.58	10.3
EKM33H	10.2 (89.8)	0.0 (0.0)	2.83 (25.0)	2.22 (19.7)	3,960	5,500	6,630	5.62	22.5
EKM41C	6.05 (53.6)	0.0 (0.0)	1.88 (16.6)	1.83 (16.2)	604	1,200	2,550	1.46	5.80
EKM41E	6.21 (54.9)	0.0 (0.0)	1.95 (17.2)	1.75 (15.5)	1,680	3,000	4,810	2.85	11.4
EKM41H	6.29 (55.6)	3.73 (33.0)	1.99 (17.6)	1.55 (13.7)	3,640	6,000	6,000	5.60	22.4
EKM42E	11.2 (99.3)	0.0 (0.0)	3.35 (29.6)	3.05 (27.0)	1,000	1,800	2,730	2.74	11.0
EKM42G	11.4 (101)	0.0 (0.0)	3.46 (30.6)	2.83 (25.0)	2,050	3,500	4,650	4.80	19.2
EKM42J	11.5 (102)	6.45 (57.0)	3.49 (30.8)	2.31 (20.4)	3,790	6,000	6,000	8.40	33.7
EKM43E	15.8 (140)	0.0 (0.0)	4.63 (40.9)	4.17 (36.9)	724	1,500	1,995	2.76	11.0
EKM43G	16.0 (142)	0.0 (0.0)	4.73 (41.8)	3.93 (34.7)	1,600	2,500	3,460	4.87	19.5
EKM43K	16.2 (143)	5.37 (47.5)	4.83 (42.7)	2.55 (22.5)	3,410	6,000	6,000	9.60	38.3
EKM44E	19.8 (175)	0.0 (0.0)	5.69 (50.3)	5.13 (45.3)	655	1,200	1,677	2.85	11.4
EKM44G	20.1 (178)	0.0 (0.0)	5.81 (51.4)	4.83 (42.7)	1,400	2,000	2,885	5.00	20.0
EKM44J	20.3 (180)	0.0 (0.0)	5.93 (52.4)	3.77 (33.3)	2,680	4,000	5,005	8.80	35.2
EKM51E	11.5 (101)	0.0 (0.0)	4.57 (40.4)	4.28 (37.8)	917	1,200	2,000	2.75	28.3
EKM51G	11.6 (102)	0.0 (0.0)	4.62 (40.8)	3.90 (34.5)	1,900	2,500	3,470	4.84	14.5
EKM51K	11.9 (105)	4.30 (38.0)	4.77 (42.2)	2.22 (19.6)	3,830	5,500	6,000	9.40	28.3
EKM52G	21.4 (189)	0.0 (0.0)	8.30 (73.4)	7.56 (66.8)	1,090	1,500	1,915	4.72	14.2
EKM52K	21.8 (193)	0.0 (0.0)	8.47 (74.9)	6.67 (59.0)	2,360	3,000	3,685	9.30	27.8
EKM52M	21.8 (193)	0.0 (0.0)	8.47 (74.9)	5.07 (44.8)	3,440	4,500	5,220	13.1	39.4
EKM53G	29.6 (262)	0.0 (0.0)	11.3 (99.7)	10.6 (93.5)	841	1,000	1,440	4.77	14.3
EKM53K	30.0 (265)	0.0 (0.0)	11.5 (101)	9.97 (88.1)	1,870	2,000	2,780	9.40	28.1
EKM53M	29.7 (263)	0.0 (0.0)	11.3 (99.7)	8.59 (76.1)	2,860	3,000	4,050	13.4	40.3
EKM53P	29.7 (263)	0.0 (0.0)	11.3 (99.7)	5.75 (50.9)	4,200	5,000	5,770	19.1	57.4
EKM54K	38.3 (338)	0.0 (0.0)	14.3 (126)	12.6 (111)	1,570	1,800	2,290	9.70	29.2
EKM54L	37.4 (330)	0.0 (0.0)	14.0 (123)	11.4 (101)	2,200	2,500	3,040	12.5	37.5
EKM54N	37.5 (331)	0.0 (0.0)	14.0 (123)	9.72 (85.9)	3,170	3,500	4,320	17.8	53.4
EKM62K	29.9 (264)	0.0 (0.0)	12.0 (105)	10.2 (89.7)	1,470	2,000	2,700	9.60	28.7
EKM62M	30.0 (265)	0.0 (0.0)	12.0 (105)	9.25 (81.8)	2,100	3,000	3,770	13.4	40.3
EKM62P	30.2 (267)	0.0 (0.0)	12.1 (106)	7.85 (69.4)	3,040	4,500	5,250	18.8	56.5
EKM63K	42.2 (374)	0.0 (0.0)	16.6 (146)	14.7 (129)	1,200	1,500	2,020	9.90	29.7
EKM63M	42.8 (378)	0.0 (0.0)	16.8 (148)	14.1 (124)	1,700	2,000	2,770	13.8	41.4
EKM63N	42.8 (378)	0.0 (0.0)	16.8 (148)	12.8 (113)	2,180	3,000	3,500	17.4	52.2
EKM64K	53.3 (471)	0.0 (0.0)	20.6 (182)	19.0 (168)	932	1,200	1,510	9.20	27.5
EKM64L	53.9 (476)	0.0 (0.0)	20.8 (183)	18.2 (160)	1,340	1,500	2,080	12.8	38.4
EKM64P	52.7 (465)	0.0 (0.0)	20.2 (178)	15.8 (139)	2,100	2,500	3,120	18.6	55.9
EKM65K	64.3 (568)	0.0 (0.0)	24.6 (217)	22.6 (199)	859	1,000	1,350	9.80	29.4
EKM65M	65.0 (574)	0.0 (0.0)	24.8 (219)	21.7 (191)	1,230	1,500	1,860	13.6	40.9
EKM65N	63.5 (561)	0.0 (0.0)	24.1 (213)	19.6 (173)	1,720	2,000	2,500	17.8	53.3
EKM72P	78.3 (692)	0.0 (0.0)	29.2 (258)	23.6 (208)	1,300	1,800	2,170	18.7	56.1
EKM73P	111 (979)	0.0 (0.0)	41.4 (365)	34.5 (305)	1,010	1,300	1,610	19.5	58.6

① See detailed motor specifications beginning on page 12.

② Peak torque ratings are for 5 seconds.

System Overview

Motor Performance, 400 VAC, 560 VDC bus, assuming Sinusoidal Commutation ①

Motor Model	Peak Stall Torque T_{ps} @ N-m (lb-in)	Peak Torque at Max. Speed T_{ms} N-m (lb-in)	Cont. Stall Torque T_{cs} N-m (lb-in)	Cont. Rated Torque T_{cr} N-m (lb-in)	Speed at Knee ω_k rpm	Rated Speed ω_r rpm	Max. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A _{RMS}	Current at Peak Torque I_{ps} A _{RMS}
EKM22C	2.68 (23.7)	1.25 (11.1)	0.79 (7.01)	0.63 (5.60)	4,560	8,000	8,000	1.39	5.60
EKM23C	3.72 (32.9)	0.0 (0.0)	1.08 (9.57)	0.94 (8.34)	3,610	5,500	7,450	1.41	5.60
EKM23D	3.79 (33.5)	2.82 (25.0)	1.11 (9.84)	0.87 (7.72)	6,240	8,000	8,000	2.19	8.80
EKM24C	4.68 (41.4)	0.0 (0.0)	1.33 (11.8)	1.20 (10.6)	3,160	4,500	6,190	1.42	5.70
EKM24D	4.71 (41.6)	2.43 (21.5)	1.36 (12.1)	1.06 (9.40)	5,430	8,000	8,000	2.21	8.80
EKM31C	3.83 (33.9)	0.0 (0.0)	1.10 (9.75)	0.95 (8.42)	3,220	5,000	7,090	1.37	5.50
EKM32C	6.87 (60.8)	0.0 (0.0)	1.95 (17.3)	1.81 (16.0)	2,050	3,000	4,310	1.44	5.70
EKM32D	7.00 (61.9)	0.0 (0.0)	1.99 (17.6)	1.60 (14.2)	3,610	5,500	6,560	2.23	8.90
EKM33C	9.71 (85.9)	0.0 (0.0)	2.66 (23.5)	2.49 (22.0)	1,460	2,000	3,230	1.47	5.90
EKM33E	9.91 (87.6)	0.0 (0.0)	2.74 (24.3)	2.29 (20.3)	3,170	4,500	5,490	2.58	10.3
EKM41C	6.05 (53.5)	0.0 (0.0)	1.88 (16.6)	1.70 (15.0)	1,580	3,000	4,480	1.46	5.80
EKM41E	6.21 (54.9)	3.22 (28.5)	1.95 (17.2)	1.51 (13.3)	3,330	6,000	6,000	2.85	11.4
EKM42C	11.0 (97.5)	0.0 (0.0)	3.28 (29.0)	3.03 (26.8)	910	1,500	2,510	1.40	5.61
EKM42E	11.2 (99.3)	0.0 (0.0)	3.35 (29.6)	2.74 (24.2)	2,130	3,500	4,790	2.74	11.0
EKM42G	11.4 (101)	6.64 (58.7)	3.46 (30.6)	2.28 (20.2)	3,890	6,000	6,000	4.80	19.2
EKM43E	15.8 (140)	0 (0)	4.63 (40.9)	3.85 (34.0)	1,640	2,500	3,490	2.76	11.0
EKM43G	16.0 (142)	1.18 (10.4)	4.73 (41.8)	2.94 (26.0)	3,100	5,000	6,000	4.87	19.5
EKM44E	19.8 (175)	0.0 (0.0)	5.69 (50.3)	4.73 (41.8)	1,470	2,000	2,945	2.85	11.4
EKM44G	20.1 (178)	0.0 (0.0)	5.81 (51.4)	3.69 (32.6)	2,730	4,000	5,050	5.00	20.0
EKM44J	20.3 (180)	15.9 (141)	5.93 (52.4)	2.68 (23.7)	4,960	6,000	6,000	8.80	35.2
EKM51E	11.5 (101)	0.0 (0.0)	4.57 (40.4)	3.85 (34.0)	1,920	2,500	3,490	2.75	8.24
EKM51G	11.6 (102)	1.13 (9.99)	4.62 (40.8)	2.49 (22.0)	3,580	5,000	6,000	4.84	14.5
EKM52E	21.2 (187)	0.0 (0.0)	8.21 (72.6)	7.48 (66.1)	1,280	1,500	2,150	3.00	9.00
EKM52G	21.4 (189)	0.0 (0.0)	8.30 (73.4)	6.93 (61.3)	2,130	2,500	3,350	4.72	14.2
EKM52K	21.8 (192)	8.39 (74.2)	8.47 (74.9)	3.77 (33.3)	4,330	5,500	6,000	9.30	27.8
EKM53G	29.6 (261)	0.0 (0.0)	11.3 (99.6)	9.72 (85.9)	1,680	2,000	2,515	4.77	14.3
EKM53K	30.0 (265)	0.0 (0.0)	11.5 (101)	7.52 (66.5)	3,470	4,000	4,855	9.40	28.1
EKM54G	37.7 (333)	0.0 (0.0)	14.2 (125)	12.8 (113)	1,420	1,500	2,085	5.00	14.9
EKM54K	38.3 (338)	0.0 (0.0)	14.3 (126)	9.97 (88.1)	2,940	3,500	4,015	9.70	29.2
EKM54L	37.4 (330)	0.0 (0.0)	14.0 (124)	8.00 (70.7)	4,030	4,500	5,315	12.5	37.5
EKM62G	29.6 (261)	0.0 (0.0)	11.7 (103)	10.2 (89.7)	1,330	1,800	2,430	4.85	14.6
EKM62K	29.9 (263)	0.0 (0.0)	12.0 (106)	8.76 (77.4)	2,710	3,500	4,705	9.60	28.7
EKM62M	30.0 (264)	11.2 (98.6)	12.0 (106)	5.49 (48.5)	3,810	6,000	6,000	13.4	40.3
EKM63G	41.6 (367)	0.0 (0.0)	16.3 (144)	14.8 (130)	941	1,200	1,625	4.48	13.4
EKM63K	42.4 (374)	0.0 (0.0)	16.6 (146)	12.7 (112)	2,230	3,000	3,520	9.90	29.7
EKM63M	42.8 (378)	0.0 (0.0)	16.8 (148)	11.1 (97.7)	3,100	4,000	4,840	13.8	41.4
EKM63N	42.8 (378)	7.50 (66.3)	16.8 (148)	9.35 (82.7)	3,940	5,000	6,000	17.4	52.2
EKM64K	53.3 (471)	0.0 (0.0)	20.6 (182)	17.0 (150)	1,760	2,000	2,645	9.20	27.5
EKM64L	53.9 (476)	0.0 (0.0)	20.8 (183)	15.4 (136)	2,470	3,000	3,635	12.8	38.4
EKM64P	52.7 (465)	0.0 (0.0)	20.2 (178)	11.7 (103)	3,810	4,500	5,455	18.6	55.9
EKM65K	64.3 (568)	0.0 (0.0)	24.6 (217)	20.0 (176)	1,630	2,000	2,365	9.80	29.4
EKM65M	65.0 (574)	0.0 (0.0)	24.8 (219)	19.0 (168)	2,280	2,500	3,245	13.6	40.9
EKM65N	63.5 (561)	0.0 (0.0)	24.1 (213)	15.8 (139)	3,150	3,500	4,365	17.8	53.3
EKM72K	79.0 (698)	0.0 (0.0)	29.5 (260)	25.0 (220)	1,100	1,500	1,855	9.30	27.8
EKM72M	79.5 (702)	0.0 (0.0)	29.8 (263)	23.4 (206)	1,560	2,000	2,585	13.0	38.9
EKM72P	78.3 (691)	0.0 (0.0)	29.2 (258)	19.9 (175)	2,350	3,000	3,795	18.7	56.1
EKM73M	113 (997)	0.0 (0.0)	41.8 (369)	33.6 (297)	1,230	1,500	1,935	13.6	40.8
EKM73P	111 (979)	0.0 (0.0)	41.4 (366)	28.3 (250)	1,830	2,400	2,825	19.5	58.6
EKM74L	143 (1262)	0.0 (0.0)	52.8 (466)	45.3 (400)	941	1,200	1,455	12.9	38.7
EKM74P	142 (1253)	0.0 (0.0)	52.3 (462)	37.4 (330)	1,420	1,800	2,115	18.5	55.5

① See detailed motor specifications beginning on page 12.

② Peak torque ratings are for 5 seconds.

System Overview

Motor Performance, 480 VAC, 640 VDC bus, assuming Sinusoidal Commutation ①

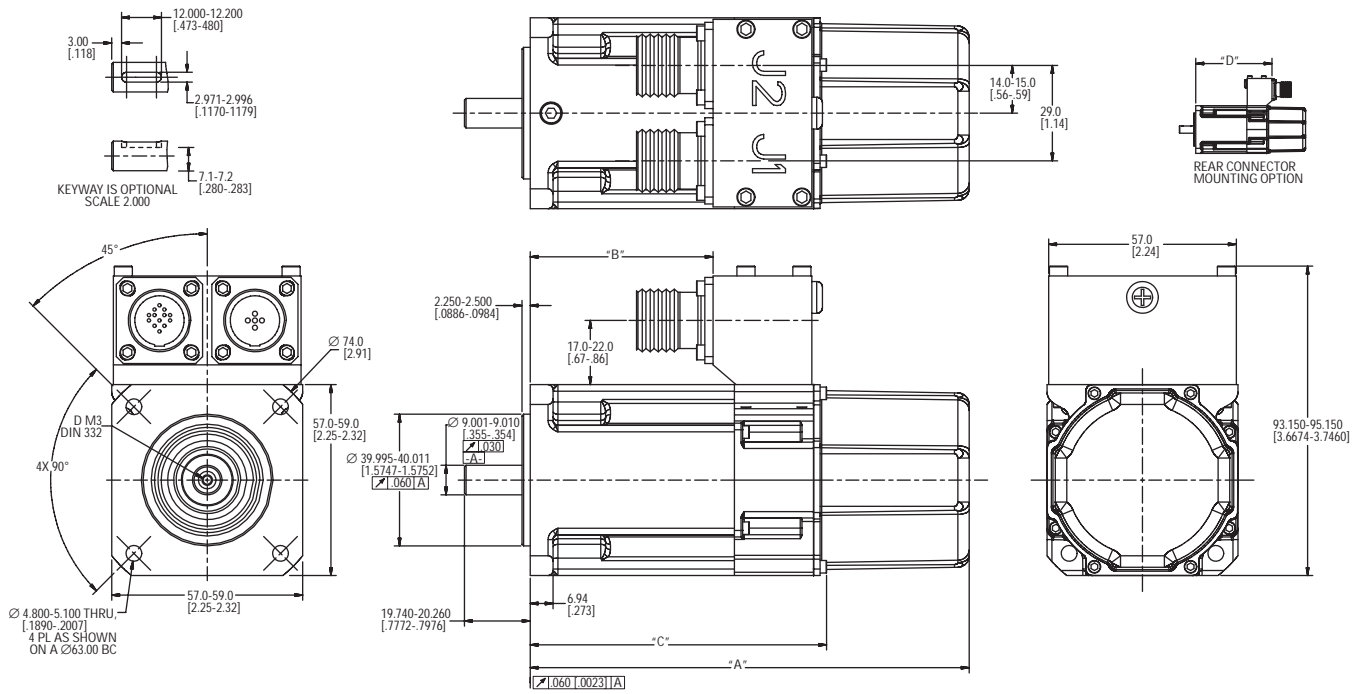
Motor Model	Peak Stall Torque T _{ps} ② N-m (lb-in)	Peak Torque at Max. Speed T _{ms} N-m (lb-in)	Cont. Stall Torque T _{cs} N-m (lb-in)	Cont. Rated Torque T _{cr} N-m (lb-in)	Speed at Knee ω _k rpm	Rated Speed ω _r rpm	Max. Speed ω _{max} rpm	Cont. Stall Current I _{cs} Arms	Current at Peak Torque I _{ps} Arms
EKM22C	2.68 (23.7)	1.71 (15.1)	0.79 (7.01)	0.63 (5.60)	5,440	8,000	8,000	1.39	5.60
EKM23C	3.72 (32.9)	0.80 (7.1)	1.08 (9.57)	0.90 (7.98)	4,340	7,000	8,000	1.41	5.60
EKM23D	3.79 (33.5)	2.82 (25.0)	1.11 (9.84)	0.87 (7.72)	7,320	8,000	8,000	2.19	8.80
EKM24C	4.68 (41.4)	0.0 (0.0)	1.33 (11.8)	1.17 (10.4)	3,800	5,500	7,080	1.42	5.70
EKM24D	4.71 (41.7)	3.46 (30.6)	1.36 (12.0)	1.06 (9.4)	6,390	8,000	8,000	2.21	8.80
EKM31C	3.83 (33.9)	0.21 (1.88)	1.10 (9.75)	0.86 (7.63)	3,850	6,000	7,990	1.37	5.50
EKM32C	6.87 (60.8)	0.0 (0.0)	1.95 (17.3)	1.78 (15.8)	2,510	3,500	4,930	1.44	5.70
EKM32D	7.00 (61.9)	0.0 (0.0)	1.99 (17.6)	1.53 (13.6)	4,280	6,000	7,500	2.23	8.90
EKM33C	9.71 (85.9)	0.0 (0.0)	2.66 (23.5)	2.45 (21.7)	1,820	2,500	3,680	1.47	5.90
EKM33E	9.91 (87.6)	0.0 (0.0)	2.74 (24.2)	2.22 (19.7)	3,760	5,000	6,270	2.58	10.3
EKM41C	6.05 (53.5)	0.0 (0.0)	1.88 (16.6)	1.67 (14.8)	1,880	3,500	5,120	1.46	5.80
EKM41E	6.21 (54.9)	4.01 (35.4)	1.95 (17.2)	1.51 (13.3)	3,870	6,000	5,990	2.85	11.4
EKM42C	11.0 (97.5)	0.0 (0.0)	3.28 (29)	2.95 (26.1)	1,120	2,000	2,870	1.40	5.61
EKM42E	11.2 (99.3)	0.0 (0.0)	3.35 (29.6)	2.65 (23.4)	2,500	4,000	5,470	2.74	11.0
EKM42G	11.4 (101)	7.92 (70.0)	3.46 (30.6)	2.28 (20.1)	4,500	6,000	6,000	4.80	19.2
EKM43E	15.8 (140)	0.0 (0.0)	4.63 (40.9)	3.69 (32.6)	1,930	3,000	4,000	2.76	11.0
EKM43G	16.0 (142)	6.68 (59.0)	4.73 (41.8)	2.50 (22.1)	3,600	6,000	6,000	4.87	19.5
EKM44E	19.8 (175)	0.0 (0.0)	5.69 (50.3)	4.49 (39.7)	1,730	2,500	3,370	2.85	11.4
EKM44G	20.1 (178)	0.0 (0.0)	5.81 (51.4)	3.12 (27.6)	3,180	5,000	5,780	5.00	20.0
EKM44J	20.3 (180)	18 (159)	5.93 (52.4)	2.68 (23.7)	5,720	6,000	6,000	8.80	35.2
EKM51E	11.5 (101)	0.0 (0.0)	4.57 (40.4)	3.67 (32.4)	2,240	3,000	4,010	2.75	8.24
EKM51G	11.6 (102)	5.81 (51.4)	4.62 (40.8)	1.81 (16)	4,140	6,000	6,000	4.84	14.5
EKM52E	21.2 (187)	0.0 (0.0)	8.21 (72.6)	7.15 (63.2)	1,500	2,000	2,470	3.00	9.00
EKM52G	21.4 (189)	0.0 (0.0)	8.30 (73.4)	6.53 (57.7)	2,480	3,000	3,840	4.72	14.2
EKM52K	21.8 (192)	15.7 (139)	8.47 (74.9)	3.12 (27.6)	4,990	6,000	6,000	9.30	27.8
EKM53G	29.6 (261)	0.0 (0.0)	11.3 (100)	9.37 (82.8)	1,960	2,400	2,880	4.77	14.3
EKM53K	30 (265)	0.0 (0.0)	11.5 (101)	6.72 (59.4)	4,000	4,500	5,550	9.40	28.1
EKM54G	37.7 (333)	0.0 (0.0)	14.2 (125)	12.2 (108)	1,660	2,000	2,390	5.00	14.9
EKM54K	38.3 (338)	0.0 (0.0)	14.3 (126)	9.12 (80.6)	3,390	4,000	4,590	9.70	29.2
EKM62G	29.6 (261)	0.0 (0.0)	11.7 (103)	10.0 (88.0)	1,550	2,000	2,790	4.85	14.6
EKM62K	29.9 (264)	0.0 (0.0)	12.0 (106)	7.77 (68.7)	3,130	4,500	5,400	9.60	28.7
EKM62M	30.0 (265)	18.6 (164)	12.0 (106)	5.49 (48.5)	4,380	6,000	6,000	13.4	40.3
EKM63G	41.6 (367)	0.0 (0.0)	16.3 (144)	14.4 (127)	1,100	1,500	1,860	4.48	13.4
EKM63K	42.4 (374)	0.0 (0.0)	16.6 (146)	11.8 (104)	2,570	3,500	4,030	9.90	29.7
EKM63M	42.8 (378)	0.0 (0.0)	16.8 (148)	10.3 (90.6)	3,570	4,500	5,550	13.8	41.4
EKM63N	42.8 (378)	24.4 (215)	16.8 (148)	6.75 (59.7)	4,530	6,000	6,000	17.4	52.2
EKM64K	53.3 (471)	0.0 (0.0)	20.6 (182)	16.1 (142)	2,040	2,500	3,030	9.20	27.5
EKM64L	53.9 (476)	0.0 (0.0)	20.8 (183)	14.2 (125)	2,850	3,500	4,160	12.8	38.4
EKM64P	52.7 (465)	15.4 (136)	20.2 (178)	8.80 (78.0)	4,380	5,500	6,000	18.6	55.9
EKM65K	64.3 (568)	0.0 (0.0)	24.6 (217)	19.5 (172)	1,890	2,200	2,710	9.80	29.4
EKM65M	65.0 (574)	0.0 (0.0)	24.8 (219)	17.9 (158)	2,620	3,000	3,720	13.6	40.9
EKM65N	63.5 (561)	0.0 (0.0)	24.1 (213)	14.5 (128)	3,620	4,000	4,990	17.8	53.3
EKM72K	79.0 (698)	0.0 (0.0)	29.5 (260)	23.8 (210)	1,270	1,800	2,130	9.30	27.8
EKM72M	79.5 (702)	0.0 (0.0)	29.8 (263)	21.9 (193)	1,790	2,500	2,960	13.0	38.9
EKM72P	78.3 (692)	0.0 (0.0)	29.2 (258)	18.0 (159)	2,700	3,500	4,350	18.7	56.1
EKM73M	113 (997)	0.0 (0.0)	41.8 (369)	31.9 (282)	1,420	1,800	2,220	13.6	40.8
EKM73P	111 (979)	0.0 (0.0)	41.4 (366)	26.1 (230)	2,100	2,800	3,230	19.5	58.6
EKM74L	143 (1262)	0.0 (0.0)	52.8 (466)	41.3 (365)	1,090	1,400	1,670	12.9	38.7
EKM74P	142 (1253)	0.0 (0.0)	52.3 (462)	35.7 (315)	1,630	2,000	2,420	18.5	55.5

① See detailed motor specifications beginning on page 12.

② Peak torque ratings are for 5 seconds.

Notes

Performance Data - EKM2x Frame



Model	"A"	"B"	"C"	"D"
EKM21	132.35 - 134.35	54.0 - 57.0	89.05 - 91.05	91.0 - 94.0
EKM22	151.35 - 153.35	73.0 - 75.0	108.05 - 110.05	110.0 - 113.0
EKM23	170.35 - 172.35	92.0 - 95.0	127.05 - 129.05	129.0 - 132.0
EKM24	189.35 - 191.35	111.0 - 114.0	146.05 - 148.05	148.0 - 151.0

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data - EKM2x Frame

EKM2X - UP TO 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

Performance & Parameters	Symbol	Units	EKM21			EKM22			EKM23			EKM24			
			Windings			Windings			Windings			Windings			
			C	E	G	C	E	G	C	D	F	C	D	F	
Max Rated Bus Voltage	V_{bus}	Vdc	320	160	75	640	320	160	640	640	320	640	640	320	
Continuous (Stall) Torque ⑤	T_{cs}	N-m	0.433	0.453	0.453	0.793	0.823	0.833	1.08	1.11	1.13	1.33	1.36	1.37	
		lb-in	3.83	4.01	4.01	7.02	7.29	7.38	9.59	9.86	10.03	11.8	12.1	12.2	
Continuous (Stall) Current	I_{cs}	A_{rms}	1.58	3.11	4.87	1.39	2.73	4.82	1.41	2.19	4.31	1.42	2.21	3.89	
		Adc	1.94	3.81	5.97	1.70	3.34	5.90	1.73	2.68	5.28	1.74	2.71	4.73	
Peak Torque	T_p	N-m	1.42	1.44	1.46	2.68	2.71	2.74	3.72	3.79	3.83	4.68	4.71	4.77	
		lb-in	12.6	12.7	12.9	23.7	24.0	24.3	32.9	33.6	33.9	41.4	41.7	42.2	
Peak Current	I_p	A_{rms}	6.30	12.4	19.5	5.60	10.9	19.3	5.60	8.80	17.2	5.70	8.80	15.6	
		Adc	7.72	15.2	23.9	6.86	13.4	23.6	6.86	10.8	21.1	6.98	10.8	19.1	
Torque Constant at 140°C	K_t	N-m / A_{rms}	0.30	0.16	0.10	0.61	0.32	0.18	0.80	0.52	0.27	0.97	0.63	0.36	
		lb-in / A_{rms}	2.7	1.4	0.9	5.4	2.8	1.6	7.1	4.6	2.4	8.6	5.6	3.2	
BEMF Constant ②	K_e	V_{rms} / K_{rpm}	19.5	10.2	6.6	39.0	20.4	11.7	51.8	33.8	17.6	62.4	40.8	23.4	
Resistance ②	R_m	Ohms	13.0	3.42	1.44	20.0	5.22	1.77	21.2	8.77	2.34	20.4	9.02	2.94	
Inductance ②	mH	mH	19	5.2	2.2	36	10	3.2	41	17	4.7	44	19	6.2	
75 VDC	Rated Speed ① ③	N_{rtd}	rpm	-	2000	4000	-	1000	2500	-	-	1500	-	-	1000
		T_{rtd}	N-m	-	0.433	0.413	-	0.803	0.783	-	-	1.10	-	-	1.34
	lb-in		-	3.83	3.66	-	7.11	6.93	-	-	9.77	-	-	11.9	
	Rated Power ① ③	P_{rtd}	kW	-	0.091	0.17	-	0.084	0.20	-	-	0.17	-	-	0.14
Hp			-	0.12	0.23	-	0.11	0.27	-	-	0.23	-	-	0.19	
160 VDC	Rated Speed ① ③	N_{rtd}	rpm	2500	7000	-	1000	3500	7000	1000	1500	4500	-	1500	3000
		T_{rtd}	N-m	0.413	0.363	-	0.783	0.763	0.693	1.06	1.07	1.02	-	1.31	1.28
	lb-in		3.66	3.21	-	6.93	6.76	6.14	9.41	9.50	9.06	-	11.6	11.4	
	Rated Power ① ③	P_{rtd}	kW	0.11	0.27	-	0.082	0.28	0.51	0.11	0.17	0.48	-	0.21	0.40
Hp			0.14	0.36	-	0.11	0.37	0.68	0.15	0.23	0.65	-	0.28	0.54	
320 VDC	Rated Speed ① ③	N_{rtd}	rpm	8000	-	-	3500	8000	-	2500	5000	8000	2000	4000	8000
		T_{rtd}	N-m	0.343	-	-	0.733	0.653	-	1.03	0.983	0.893	1.27	1.24	1.07
	lb-in		3.04	-	-	6.49	5.78	-	9.15	8.71	7.91	11.3	11.0	9.50	
	Rated Power ① ③	P_{rtd}	kW	0.29	-	-	0.27	0.55	-	0.27	0.51	0.75	0.27	0.52	0.90
Hp			0.39	-	-	0.36	0.73	-	0.36	0.69	1.00	0.36	0.70	1.20	
560 VDC	Rated Speed ① ③	N_{rtd}	rpm	-	-	-	8000	-	-	5500	8000	-	4500	8000	-
		T_{rtd}	N-m	-	-	-	0.633	-	-	0.943	0.873	-	1.20	1.06	-
	lb-in		-	-	-	5.61	-	-	8.35	7.73	-	10.7	9.41	-	
	Rated Power ① ③	P_{rtd}	kW	-	-	-	0.53	-	-	0.54	0.73	-	0.57	0.89	-
Hp			-	-	-	0.71	-	-	0.73	0.98	-	0.76	1.19	-	
640 VDC	Rated Speed ① ③	N_{rtd}	rpm	-	-	-	8000	-	-	7000	8000	-	5500	8000	-
		T_{rtd}	N-m	-	-	-	0.633	-	-	0.903	0.873	-	1.17	1.06	-
	lb-in		-	-	-	5.61	-	-	8.00	7.73	-	10.39	9.41	-	
	Rated Power ① ③	P_{rtd}	kW	-	-	-	0.53	-	-	0.66	0.73	-	0.68	0.89	-
Hp			-	-	-	0.71	-	-	0.89	0.98	-	0.91	1.19	-	
Inertia (includes resolver)	J_m	kg-cm ²	0.11			0.16			0.22			0.27			
		lb-in-s ²	9.50E-05			1.40E-04			1.90E-04			2.40E-04			
Brake Inertia (additional)	J_m	kg-cm ²	0.012			0.012			0.012			0.012			
		lb-in-s ²	1.10E-05			1.10E-05			1.10E-05			1.10E-05			
Static Friction (includes shaft seal)	T_f	N-m	0.049			0.052			0.054			0.057			
		lb-in	0.434			0.461			0.478			0.505			
Viscous Damping	K_{dv}	N-m / k_{rpm}	0.0046			0.0055			0.0065			0.0074			
		lb-in / k_{rpm}	0.04			0.05			0.06			0.07			
Weight ⑥	W	kg	0.91			1.18			1.45			1.77			
		lb	2.00			2.60			3.20			3.90			
Thermal Time Constant	TCT	minutes	8			9			10			11			
Thermal Resistance	R_{th}	°C / Watt	1.43			1.19			1.10			1.07			
Heat Sink Size	Aluminum	inch	10" x 10" x 1/4"			10" x 10" x 1/4"			10" x 10" x 1/4"			10" x 10" x 1/4"			
Poles Pair			3			3			3			3			
Maximum Mechanical Speed ④	N_{max}	rpm	8,000			8,000			8,000			8,000			

Notes:

① Motor Performance based on $\Delta T = 100^\circ C$ in a $40^\circ C$ ambient (winding temp = $140^\circ C$) with listed Heat Sink.

② Motor Parameters BEMF, Resistance, and Inductance measured at $25^\circ C$.

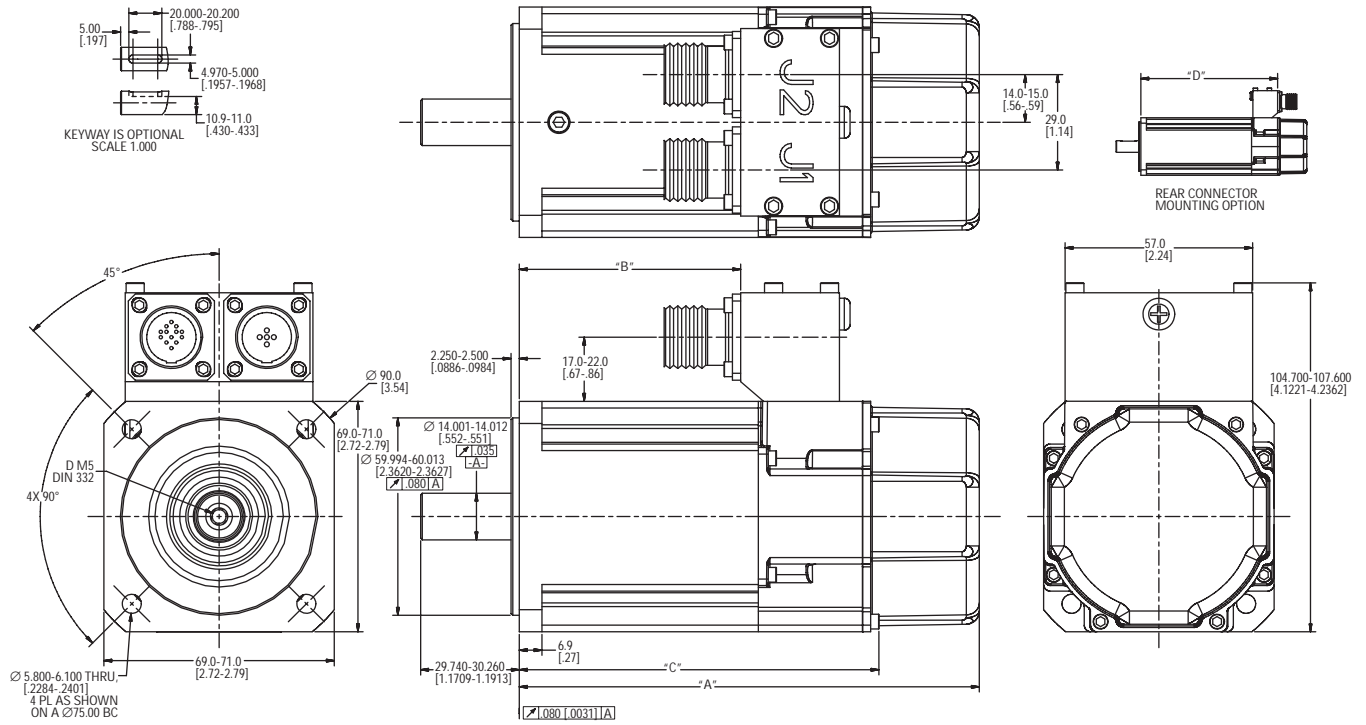
③ All data referenced to sinusoidal commutation.

④ Speed may be limited by V_{bus} .

⑤ Brake option reduces continuous torque by: EKM21 = 0.0 N-m EKM22 = 0.01 N-m EKM23 = 0.02 N-m EKM24 = 0.05 N-m

⑥ Motor weight does not include brake option.

Performance Data - EKM3x Frame



Model	"A"	"B"	"C"	"D"
EKM31	138.74 - 140.74	65.74 - 88.74	108.24 - 110.24	102.74 - 105.74
EKM32	169.74 - 171.74	96.74 - 99.74	139.24 - 141.24	133.74 - 136.74
EKM33	200.74 - 202.74	127.74 - 130.74	170.24 - 172.24	164.74 - 167.74

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data EKM3x Frame

EKM3x - Up to 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

Performance & Parameters	Symbol	Units	EKM31			EKM32			EKM33		
			Windings			Windings			Windings		
			C	E	H	C	D	H	C	E	H
Max Rated Bus Voltage	V_{bus}	Vdc	640	320	160	640	640	320	640	640	320
Continuous (Stall) Torque ⑤	T_{cs}	N-m	1.10	1.15	1.18	1.95	1.99	2.05	2.66	2.74	2.83
		lb-in	9.8	10.2	10.5	17.3	17.7	18.2	23.6	24.3	25.1
Continuous (Stall) Current	I_{cs}	A_{rms}	1.37	2.99	5.85	1.44	2.23	5.50	1.47	2.58	5.62
		A_{dc}	1.68	3.66	7.17	1.76	2.73	6.74	1.80	3.16	6.88
Peak Torque	T_p	N-m	3.83	3.95	4.01	6.87	7.00	7.21	9.71	9.91	10.2
		lb-in	33.9	35.0	35.5	60.8	62.0	63.9	86.0	87.8	90.3
Peak Current	I_p	A_{rms}	5.50	12.0	23.4	5.70	8.90	22.0	5.90	10.3	22.5
		A_{dc}	6.74	14.7	28.7	6.98	10.9	27.0	7.23	12.6	27.6
Torque Constant at 140°C	K_t	N-m / A_{rms}	0.85	0.41	0.21	1.40	0.92	0.39	1.86	1.10	0.52
		lb-in / A_{rms}	7.5	3.6	1.9	12.4	8.1	3.5	16.5	9.7	4.6
BEMF Constant ②	K_e	V_{rms} / K_{rpm}	54.5	26.1	13.7	89.8	59.0	24.8	120	70.6	33.4
Resistance ②	R_m	Ohms	21.4	4.74	1.29	23.8	10.30	1.69	26.6	9.01	1.96
Inductance ②	mH	mH	38	8.6	2.4	47	20	3.6	54	19	4.1
75 VDC Rated Speed ① ③	N_{rtd}	rpm	-	750	2000	-	-	1200	-	-	800
		N-m	-	1.14	1.15	-	-	2.01	-	-	2.77
Rated Torque ① ③ ⑤	T_{rtd}	lb-in	-	10.1	10.2	-	-	17.8	-	-	24.6
		kW	-	0.090	0.24	-	-	0.25	-	-	0.23
Rated Power ① ③	P_{rtd}	Hp	-	0.12	0.32	-	-	0.34	-	-	0.31
		rpm	-	2500	6000	-	1000	3000	-	-	2500
160 VDC Rated Speed ① ③	N_{rtd}	N-m	-	1.12	0.923	-	1.95	1.91	-	-	2.61
		lb-in	-	9.95	8.17	-	17.3	16.9	-	-	23.1
Rated Torque ① ③ ⑤	T_{rtd}	kW	-	0.29	0.58	-	0.20	0.60	-	-	0.68
		Hp	-	0.39	0.78	-	0.27	0.81	-	-	0.92
320 VDC Rated Speed ① ③	N_{rtd}	rpm	2500	6000	-	1500	2500	7000	1000	2000	5500
		N-m	1.07	0.903	-	1.90	1.88	1.40	2.59	2.57	2.22
Rated Torque ① ③ ⑤	T_{rtd}	lb-in	9.50	8.00	-	16.9	16.7	12.4	23.0	22.8	19.7
		kW	0.28	0.57	-	0.30	0.49	1.03	0.27	0.54	1.28
Rated Power ① ③	P_{rtd}	Hp	0.38	0.76	-	0.40	0.66	1.38	0.36	0.72	1.72
		rpm	5000	-	-	3000	5500	-	2000	4500	-
560 VDC Rated Speed ① ③	N_{rtd}	N-m	0.953	-	-	1.81	1.60	-	2.49	2.29	-
		lb-in	8.44	-	-	16.1	14.2	-	22.1	20.3	-
Rated Torque ① ③ ⑤	T_{rtd}	kW	0.50	-	-	0.57	0.92	-	0.52	1.08	-
		Hp	0.67	-	-	0.76	1.24	-	0.70	1.45	-
640 VDC Rated Speed ① ③	N_{rtd}	rpm	6000	-	-	3500	6000	-	2500	5000	-
		N-m	0.863	-	-	1.78	1.53	-	2.45	2.22	-
Rated Torque ① ③ ⑤	T_{rtd}	lb-in	7.64	-	-	15.8	13.6	-	21.7	19.7	-
		kW	0.54	-	-	0.65	0.96	-	0.64	1.16	-
Rated Power ① ③	P_{rtd}	Hp	0.73	-	-	0.88	1.29	-	0.86	1.56	-
		J_m	kg-cm ²	0.33			0.59			0.85	
Inertia (includes resolver)	J_m	lb-in-s ²	2.90E-04			5.20E-04			7.50E-04		
		J_m	kg-cm ²	0.012			0.012			0.012	
Brake Inertia (additional)	J_m	lb-in-s ²	1.10E-05			1.10E-05			1.10E-05		
		T_f	N-m	0.061			0.067			0.073	
Static Friction (includes shaft seal)	T_f	lb-in	0.540			0.593			0.646		
		K_{dv}	N-m / k_{rpm}	0.002			0.003			0.004	
Viscous Damping	K_{dv}	lb-in / k_{rpm}	0.02			0.03			0.04		
		W	kg	1.64			2.32			3.00	
Weight ⑥	W	lb	3.60			5.10			6.60		
		TCT	minutes	14			17			20	
Thermal Time Constant	TCT	minutes	14			17			20		
Thermal Resistance	R_{th}	°C / Watt	1.11			0.92			0.78		
Heat Sink Size	Aluminum	inch	10" x 10" x 1/4"			10" x 10" x 1/4"			10" x 10" x 1/4"		
Poles Pair			4			4			4		
Maximum Mechanical Speed ④	N_{max}	rpm	8,000			8,000			8,000		

Notes:

① Motor Performance based on $\Delta T = 100^\circ C$ in a $40^\circ C$ ambient (winding temp = $140^\circ C$) with listed Heat Sink.② Motor Parameters BEMF, Resistance, and Inductance measured at $25^\circ C$.

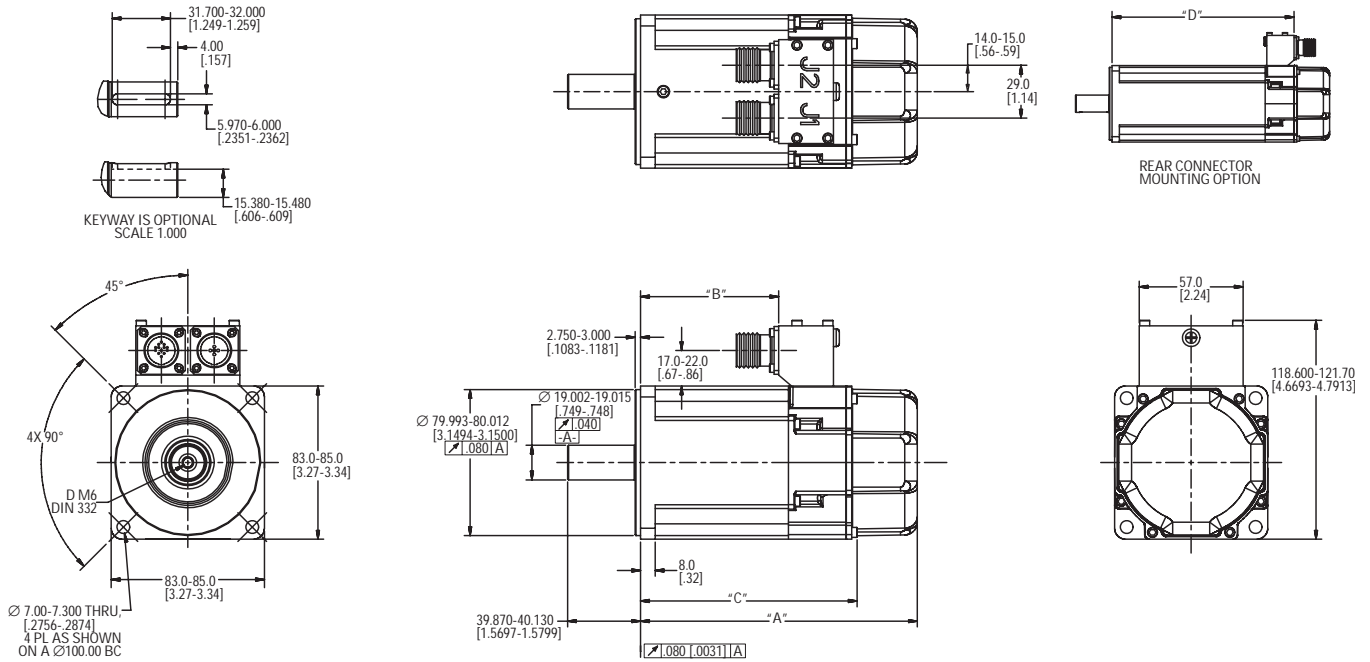
③ All data referenced to sinusoidal commutation.

④ Speed may be limited by V_{bus} .

⑤ Brake option reduces continuous torque by: EKM31 = 0.0 N-m EKM32 = 0.05 N-m EKM33 = 0.1 N-m

⑥ Motor weight does not include brake option.

Performance Data - EKM4x Frame



Model	"A"	"B"	"C"	"D"
EKM41	150.75 - 152.75	74.25 - 77.25	117.25 - 119.25	111.25 - 114.25
EKM42	179.75 - 181.75	103.25 - 106.25	148.25 - 148.25	140.25 - 143.25
EKM43	208.75 - 210.75	132.25 - 135.25	175.25 - 177.25	169.25 - 172.25
EKM44	237.75 - 239.75	161.25 - 164.25	204.25 - 206.25	198.25 - 201.25

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data - EKM4x Frame

EKM4x - Up to 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

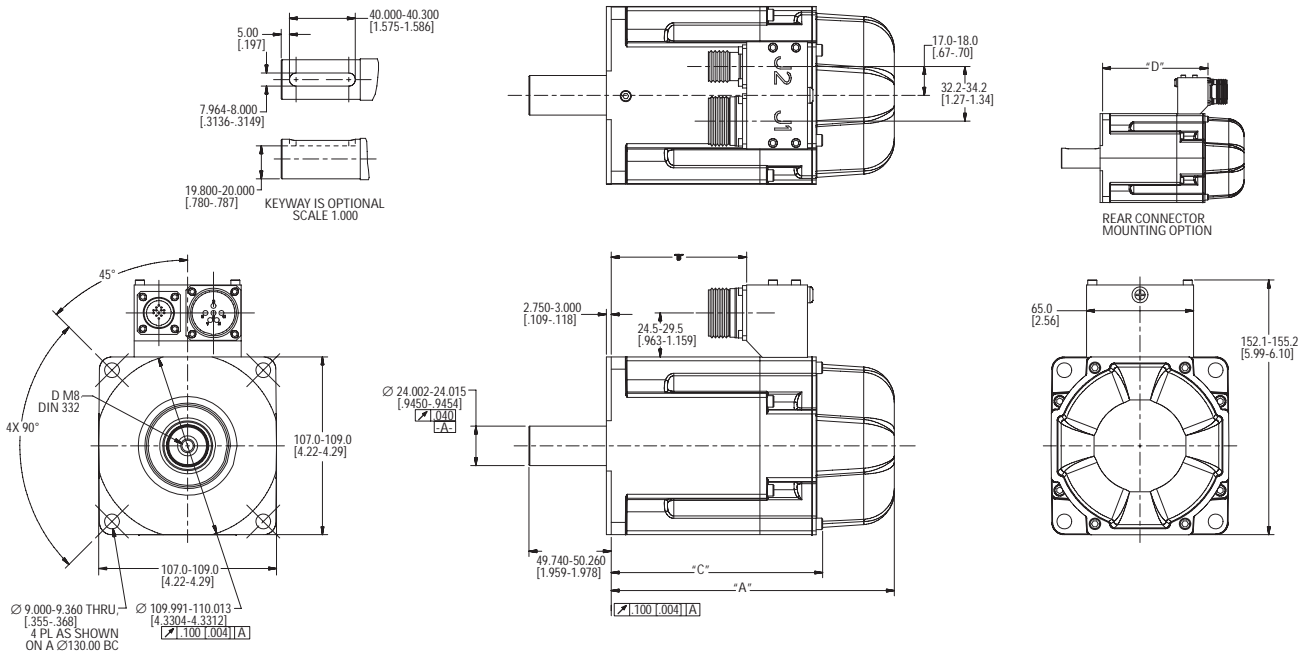
Performance & Parameters	Symbol	Units	EKM41			EKM42				EKM43			EKM44				
			Windings			Windings				Windings			Windings				
			C	E	H	C	E	G	J	E	G	K	E	G	J		
Max Rated Bus Voltage	V _{bus}	V _{dc}	640	640	320	640	640	640	320	640	640	320	640	640	640		
Continuous (Stall) Torque ⑤	T _{cs}	N-m	1.88	1.95	1.99	3.28	3.35	3.46	3.49	4.63	4.73	4.83	5.69	5.81	5.93		
		lb-in	16.6	17.3	17.6	29.0	29.7	30.6	30.9	41.0	41.9	42.8	50.4	51.4	52.5		
Continuous (Stall) Current	I _{cs}	A _{rms}	1.46	2.85	5.60	1.40	2.74	4.80	8.40	2.76	4.87	9.60	2.90	5.00	8.80		
		A _{dc}	1.79	3.49	6.86	1.72	3.36	5.88	10.3	3.38	5.97	11.8	3.55	6.13	10.8		
Peak Torque	T _p	N-m	6.05	6.21	6.29	11.0	11.2	11.4	11.5	15.8	16.0	16.2	19.8	20.1	20.3		
		lb-in	53.6	55.0	55.7	97.4	99.2	101	102	140	142	143	175	178	180		
Peak Current	I _p	A _{rms}	5.80	11.4	22.4	5.61	11.0	19.2	33.7	11.0	19.5	38.3	11.4	20.0	35.2		
		A _{dc}	7.11	14.0	27.4	6.87	13.5	23.5	41.3	13.5	23.9	46.9	13.97	24.5	43.1		
Torque Constant at 140°C	K _t	N-m / A _{rms}	1.34	0.71	0.37	2.40	1.26	0.74	0.43	1.72	0.99	0.52	2.04	1.19	0.69		
		lb-in / A _{rms}	11.9	6.29	3.28	21.4	11.2	6.55	3.81	15.2	8.77	4.61	18.1	10.5	6.11		
BEMF Constant ②	K _e	V _{rms} / K _{rpm}	86.3	45.6	23.7	154	80.9	47.5	27.5	111	63.9	33.2	132	76.6	44.2		
Resistance ②	R _m	Ohms	21.3	6.02	1.56	27.5	7.78	2.51	0.800	8.61	2.81	0.740	8.04	2.80	0.940		
Inductance ②	mH	mH	66	18	5.0	97	27	9.2	3.1	33	11	2.9	34	12	3.8		
75 VDC	Rated Speed ① ③	N _{ritd}	rpm	-	-	1000	-	-	-	-	-	-	-	-	-		
		Rated Torque ① ③ ⑤	T _{ritd}	N-m	-	-	1.92	-	-	-	-	-	-	-	-	-	
				lb-in	-	-	17.0	-	-	-	-	-	-	-	-	-	
Rated Power ① ③	P _{ritd}	kW	-	-	0.20	-	-	-	-	-	-	-	-	-	-		
		Hp	-	-	0.27	-	-	-	-	-	-	-	-	-	-		
160 VDC	Rated Speed ① ③	N _{ritd}	rpm	-	1200	3000	-	-	-	3000	-	-	2500	-	-	-	
		Rated Torque ① ③ ⑤	T _{ritd}	N-m	-	1.81	1.75	-	-	-	2.96	-	-	4.01	-	-	-
				lb-in	-	16.0	15.5	-	-	-	26.2	-	-	35.5	-	-	-
		Rated Power ① ③	P _{ritd}	kW	-	0.23	0.55	-	-	-	0.93	-	-	1.05	-	-	-
Hp	-			0.30	0.74	-	-	-	1.25	-	-	1.41	-	-	-		
320 VDC	Rated Speed ① ③	N _{ritd}	rpm	1200	3000	6000	-	1800	3500	6000	1500	2500	6000	1200	2000	4000	
		Rated Torque ① ③ ⑤	T _{ritd}	N-m	1.81	1.75	1.55	-	3.05	2.83	2.31	4.17	3.93	2.55	5.15	4.83	3.77
				lb-in	16.0	15.5	13.7	-	27.0	25.1	20.4	36.9	34.8	22.6	45.6	42.8	33.4
		Rated Power ① ③	P _{ritd}	kW	0.23	0.55	0.97	-	0.57	1.04	1.45	0.65	1.03	1.60	0.65	1.01	1.58
Hp	0.30			0.74	1.30	-	0.77	1.39	1.94	0.88	1.38	2.15	0.87	1.36	2.12		
560 VDC	Rated Speed ① ③	N _{ritd}	rpm	3000	6000	-	1500	3500	6000	-	2500	5000	-	2000	4000	6000	
		Rated Torque ① ③ ⑤	T _{ritd}	N-m	1.70	1.51	-	3.03	2.74	2.28	-	3.85	2.94	-	4.73	3.69	2.68
				lb-in	15.0	13.4	-	26.8	24.3	20.2	-	34.1	26.0	-	41.9	32.7	23.7
		Rated Power ① ③	P _{ritd}	kW	0.53	0.95	-	0.48	1.00	1.43	-	1.01	1.54	-	0.99	1.55	1.68
Hp	0.72			1.27	-	0.64	1.35	1.92	-	1.35	2.06	-	1.33	2.07	2.26		
640 VDC	Rated Speed ① ③	N _{ritd}	rpm	3500	6000	-	2000	4000	6000	-	3000	6000	-	2500	5000	6000	
		Rated Torque ① ③ ⑤	T _{ritd}	N-m	1.67	1.51	-	2.95	2.65	2.28	-	3.69	2.50	-	4.49	3.12	2.68
				lb-in	14.8	13.4	-	26.1	23.5	20.2	-	32.7	22.1	-	39.8	27.6	23.7
		Rated Power ① ③	P _{ritd}	kW	0.61	0.95	-	0.62	1.11	1.43	-	1.16	1.57	-	1.18	1.63	1.68
Hp	0.82			1.27	-	0.83	1.49	1.92	-	1.55	2.10	-	1.58	2.19	2.26		
Inertia (includes resolver)	J _m	kg-cm ²	0.81			1.5				2.1			2.7				
		lb-in-s ²	7.20E-04			1.30E-03				1.80E-03			2.40E-03				
Brake Inertia (additional)	J _m	kg-cm ²	0.068			0.068				0.068			0.068				
		lb-in-s ²	6.00E-05			6.00E-05				6.00E-05			6.00E-05				
Static Friction (includes shaft seal)	T _f	N-m	0.085			0.097				0.109			0.121				
		lb-in	0.753			0.859				0.965			1.07				
Viscous Damping	K _{dv}	N-m / K _{rpm}	0.009			0.013				0.017			0.021				
		lb-in / K _{rpm}	0.08			0.12				0.15			0.19				
Weight ⑥	W	Kg	2.55			3.50				4.45			0.54				
		lb	5.60			7.70				9.80			11.9				
Thermal Time Constant	TCT	minutes	13			17				20			24				
Thermal Resistance	R _{th}	°C / Watt	0.97			0.80				0.70			0.65				
Heat Sink Size	Aluminum	inch	10" x 10" x 1/4"			10" x 10" x 1/4"				10" x 10" x 1/4"			10" x 10" x 1/4"				
Poles Pair			5			5				5			5				
Maximum Mechanical Speed ④	N _{max}	rpm	6,000			6,000				6,000			6,000				

Notes:

- ① Motor Performance based on ΔT = 100°C in a 40°C ambient (winding temp = 140°C) with listed Heat Sink.
- ② Motor Parameters BEMF, Resistance, and Inductance measured at 25°C.
- ③ All data referenced to sinusoidal commutation.

- ④ Speed may be limited by V_{bus}.
- ⑤ Brake option reduces continuous torque by 0.012 N-m.
- ⑥ Motor weight does not include brake option.

Performance Data - EKM5x Frame



Model	"A"	"B"	"C"	"D"
EKM51	170.95 - 172.95	80.75 - 83.75	125.95 - 127.95	126.75 - 129.75
EKM52	201.95 - 203.95	111.75 - 114.75	156.95 - 158.95	157.75 - 160.75
EKM53	232.95 - 234.95	142.75 - 145.75	187.95 - 189.95	188.75 - 191.75
EKM54	263.95 - 265.95	173.75 - 176.75	218.95 - 220.95	219.75 - 222.75

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data - EKM5x Frame

EKM5x - Up to 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

Performance & Parameters	Symbol	Units	EKM51			EKM52				EKM53				EKM54				
			Windings			Windings				Windings				Windings				
			E	G	K	E	G	K	M	G	K	M	P	G	K	L	N	
Max Rated Bus Voltage	V _{bus}	V _{dc}	640	640	320	640	640	640	320	640	640	320	320	640	640	560	320	
Continuous (Stall) Torque ⑤	T _{cs}	N-m	4.57	4.62	4.77	8.21	8.30	8.47	8.47	11.3	11.5	11.3	11.3	14.2	14.3	14.0	14.0	
		lb-in	40.5	40.9	42.2	72.7	73.5	75.0	75.0	100	102	100	100	125	126	124	124	
Continuous (Stall) Current	I _{cs}	A _{rms}	2.75	4.84	9.4	2.99	4.72	9.30	13.1	4.77	9.40	13.4	19.1	5.00	9.7	12.5	17.8	
		A _{dc}	3.37	5.93	11.5	3.66	5.8	11.4	16.0	5.8	11.5	16.4	23.4	6.13	11.9	15.3	21.8	
Peak Torque	T _p	N-m	11.5	11.6	11.9	21.2	21.4	21.8	21.8	29.6	30.0	29.7	29.7	37.7	38.3	37.4	37.5	
		lb-in	102	102	105	187	189	193	193	262	266	263	263	334	339	331	332	
Peak Current	I _p	A _{rms}	8.24	14.5	28.3	9.00	14.2	27.8	39.4	14.3	28.1	40.3	57.4	14.9	29.2	37.5	53.4	
		A _{dc}	10.1	17.8	34.7	11.0	17.4	34.1	48.3	17.5	34.4	49.4	70.3	18.3	35.8	45.9	65.4	
Torque Constant at 140°C	K _t	N-m / A _{rms}	1.72	0.99	0.52	2.79	1.79	0.93	0.66	2.39	1.24	0.85	0.60	2.88	1.50	1.13	0.80	
		lb-in / A _{rms}	15.2	8.77	4.61	24.7	15.9	8.24	5.84	21.2	11.0	7.53	5.31	25.5	13.3	10.0	7.08	
BEMF Constant ②	K _e	V _{rms} / K _{rpm}	110	63.6	33.5	179	115	60.1	42.4	154	79.8	54.7	38.4	185	96.6	72.9	51.3	
Resistance ②	R _m	Ohms	8.98	2.87	0.75	8.96	3.70	0.96	0.49	3.97	1.06	0.51	0.28	4.08	1.08	0.65	0.33	
Inductance ②	mH	mH	37	12	3.4	45	19	5.0	2.5	21	5.7	2.7	1.3	23	6.2	3.5	1.8	
75 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	lb-in		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Rated Power ① ③	P _{rtid}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hp			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
160 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	2500	-	-	-	-	-	-	-	-	-	-	-	
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	4.02	-	-	-	-	-	-	-	-	-	-	-
	lb-in		-	-	35.6	-	-	-	-	-	-	-	-	-	-	-	-	
	Rated Power ① ③	P _{rtid}	kW	-	-	1.05	-	-	-	-	-	-	-	-	-	-	-	-
Hp			-	-	1.41	-	-	-	-	-	-	-	-	-	-	-	-	
320 VDC	Rated Speed ① ③	N _{rtid}	rpm	1200	2500	5500	-	1500	3000	4500	1000	2000	3000	5000	-	1800	2500	3500
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	4.28	3.89	2.22	-	7.56	6.67	5.07	10.6	9.97	8.59	5.75	-	12.6	11.4
	lb-in		37.9	34.4	19.7	-	67.0	59.1	44.9	93.6	88.3	76.1	50.9	-	111	100.7	86.1	
	Rated Power ① ③	P _{rtid}	kW	0.54	1.02	1.28	-	1.19	2.10	2.39	1.11	2.09	2.70	3.01	-	2.37	2.98	3.56
Hp			0.72	1.37	1.71	-	1.59	2.81	3.20	1.48	2.80	3.62	4.04	-	3.18	3.99	4.78	
560 VDC	Rated Speed ① ③	N _{rtid}	rpm	2500	5000	-	1500	2500	5500	-	2000	4000	-	-	1500	3500	4500	-
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	3.85	2.49	-	7.48	6.93	3.77	-	9.72	7.52	-	-	12.8	9.92	8.00
	lb-in		34.1	22.1	-	66.2	61.4	33.4	-	86.1	66.6	-	-	-	113	87.9	70.8	-
	Rated Power ① ③	P _{rtid}	kW	1.01	1.30	-	1.17	1.81	2.17	-	2.04	3.15	-	-	2.01	3.64	3.77	-
Hp			1.35	1.75	-	1.58	2.43	2.91	-	2.73	4.22	-	-	2.69	4.87	5.05	-	
640 VDC	Rated Speed ① ③	N _{rtid}	rpm	3000	6000	-	2000	3000	6000	-	2400	4500	-	-	2000	4000	-	-
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	3.67	1.81	-	7.15	6.53	3.12	-	9.37	6.72	-	-	12.2	9.12	-
	lb-in		32.5	16.0	-	63.3	57.8	27.6	-	83.0	59.5	-	-	-	108	80.8	-	-
	Rated Power ① ③	P _{rtid}	kW	1.15	1.14	-	1.50	2.05	1.96	-	2.35	3.17	-	-	2.55	3.82	-	-
Hp			1.55	1.52	-	2.01	2.75	2.63	-	3.16	4.24	-	-	3.42	5.12	-	-	
Inertia (includes resolver)	J _m	kg-cm ²	3.4			6.2				9.1				12				
		lb-in-s ²	3.00E-03			5.50E-03				8.10E-03				1.10E-02				
Brake Inertia (additional)	J _m	kg-cm ²	0.17			0.17				0.17				0.17				
		lb-in-s ²	1.50E-04			1.50E-04				1.50E-04				1.50E-04				
Static Friction (includes shaft seal)	T _f	N-m	0.152			0.170				0.188				0.207				
		lb-in	1.35			1.51				1.66				1.83				
Viscous Damping	K _{dv}	N-m / k _{rpm}	0.033			0.042				0.052				0.061				
		lb-in / k _{rpm}	0.29			0.37				0.46				0.54				
Weight ⑥	W	Kg	4.50			6.10				7.68				9.27				
		lb	9.90			13.4				16.9				20.4				
Thermal Time Constant	TCT	minutes	20			24				28				31				
Thermal Resistance	R _{th}	°C / Watt	0.68			0.56				0.50				0.45				
Heat Sink Size	Aluminum	inch	12" x 12" x 1/2"			12 x 12" x 1/2"				12" x 12" x 1/2"				12" x 12" x 1/2"				
Poles Pair			5			5				5				5				
Maximum Mechanical Speed ④	N _{max}	rpm	6,000			6,000				6,000				6,000				

Notes:

① Motor Performance based on ΔT = 100°C in a 40°C ambient (winding temp = 140°C) with listed Heat Sink.

② Motor Parameters BEMF, Resistance, and Inductance measured at 25°C.

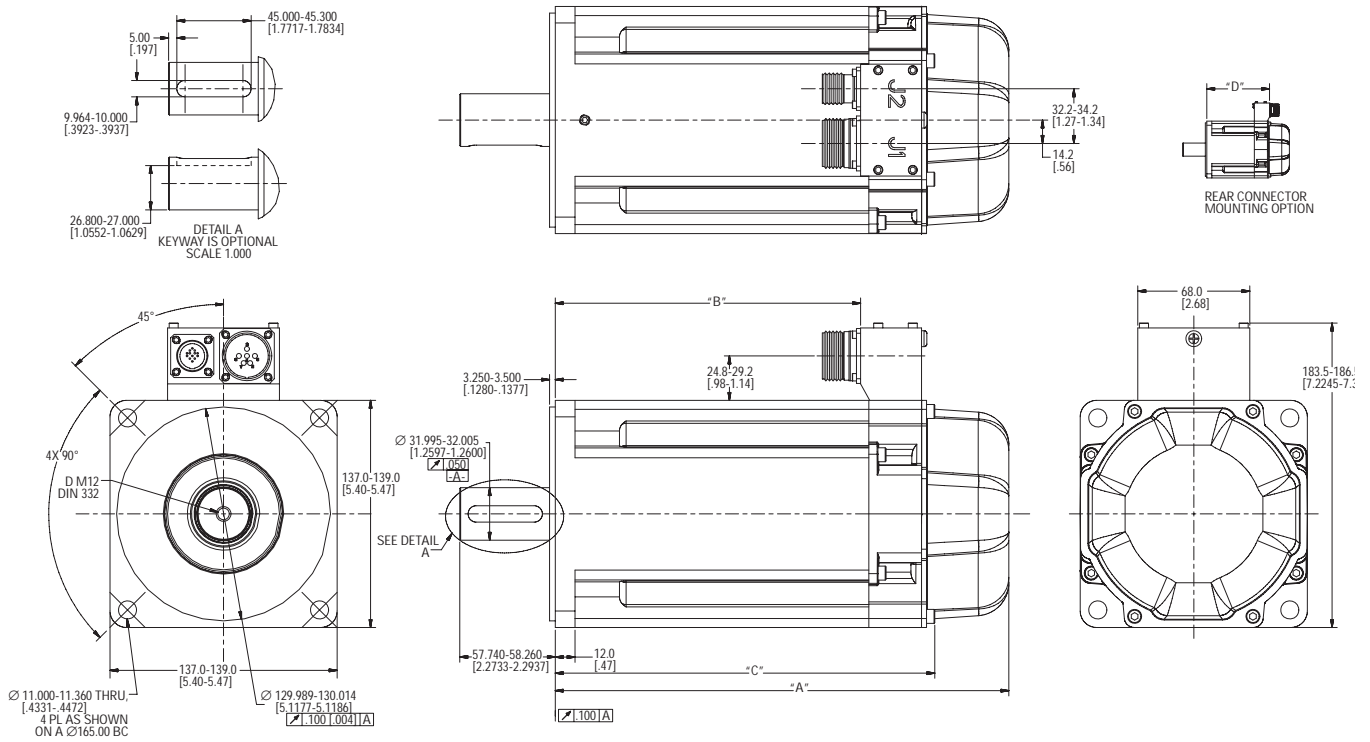
③ All data referenced to sinusoidal commutation.

④ Speed may be limited by V_{bus}.

⑤ Brake option reduces continuous torque by: EKM51 = 0.15 N-m EKM52 = 0.26 N-m EKM53 = 0.35 N-m EKM54 = 0.43 N-m

⑥ Motor weight does not include brake option.

Performance Data - EKM6x Frame



Model	"A"	"B"	"C"	"D"
EKM62	199.55 - 201.55	109.00 - 112.00	154.6 - 156.6	135.7 - 138.8
EKM63	224.55 - 226.55	134.00 - 137.00	179.6 - 181.6	160.7 - 163.8
EKM64	249.55 - 251.55	159.00 - 162.00	204.6 - 206.6	185.7 - 188.8
EKM65	274.55 - 276.55	184.00 - 187.00	229.6 - 231.6	210.7 - 213.8

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data - EKM6x Frame

EKM6x - Up to 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

Performance & Parameters	Symbol	Units	EKM62				EKM63				EKM64			EKM65			
			Windings				Windings				Windings			Windings			
			G	K	M	P	G	K	M	N	K	L	P	K	M	N	
Max Rated Bus Voltage	V _{bus}	V _{dc}	640	640	640	320	640	640	640	640	640	640	640	640	640		
Continuous (Stall) Torque ⑤	T _{cs}	N-m	11.7	12.0	12.0	12.1	16.3	16.6	16.8	16.8	20.6	20.8	20.2	24.6	24.8	24.1	
		In-lb	103	106	106	107	144	147	148	148	182	184	178	217	219	213	
Continuous (Stall) Current	I _{cs}	A _{rms}	4.9	9.6	13.4	18.8	4.5	9.9	13.8	17.4	9.2	12.8	18.6	9.8	13.6	17.8	
		A _{dc}	6.00	11.8	16.4	23.0	5.51	12.1	16.9	21.3	11.3	15.7	22.8	12.01	16.7	21.8	
Peak Torque	T _p	N-m	29.6	29.9	30.0	30.2	41.6	42.4	42.8	42.8	53.3	53.9	52.7	64.3	65.0	63.5	
		In-lb	262	265	266	267	368	375	379	379	472	477	467	569	576	562	
Peak Current	I _p	A _{rms}	14.6	28.7	40.3	56.5	13.4	29.7	41.4	52.2	27.5	38.4	55.9	29.4	40.9	53.3	
		A _{dc}	17.9	35.2	49.4	69.2	16.4	36.4	50.7	63.9	33.7	47.0	68.5	36.0	50.1	65.3	
Torque Constant at 140°C	K _t	N-m / A _{rms}	2.47	1.28	0.91	0.66	3.70	1.71	1.24	0.98	2.28	1.66	1.10	2.54	1.85	1.38	
		In-lb / A _{rms}	21.9	11.3	8.06	5.84	32.8	15.1	11.0	8.68	20.2	14.70	9.74	22.5	16.4	12.2	
BEMF Constant ②	K _e	V _{rms} / K _{rpm}	159	82.1	58.8	42.2	238	110	79.9	63.3	147	107	71.0	164	119	88.8	
Resistance ②	R _m	Ohms	4.13	1.08	0.57	0.30	5.50	1.14	0.61	0.39	1.41	0.75	0.36	1.35	0.73	0.43	
Inductance ②	mH	mH	32	8.5	4.4	2.2	44	9.3	4.9	3.1	12	6.2	2.8	11	6.1	3.4	
75 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	
		T _{rtid}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	
160 VDC	Rated Torque ① ③ ⑤	T _{rtid}	In-lb	-	-	-	-	-	-	-	-	-	-	-	-	-	
		P _{rtid}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	
320 VDC	Rated Power ① ③	P _{rtid}	Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N _{rtid}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	
560 VDC	Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	
		P _{rtid}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	
640 VDC	Rated Power ① ③	P _{rtid}	Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	
		N _{rtid}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	
75 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	2000	3000	4500	-	1500	2000	3000	1200	1500	2500	1000	1500	2000
		T _{rtid}	N-m	-	10.2	9.25	7.85	-	14.7	14.1	12.8	18.6	18.2	15.8	22.6	21.7	19.6
160 VDC	Rated Torque ① ③ ⑤	T _{rtid}	In-lb	-	89.9	81.9	69.5	-	130	124	113	164	161	139	200	192	173
		P _{rtid}	kW	-	2.13	2.91	3.70	-	2.30	2.94	4.01	2.33	2.85	4.12	2.36	3.40	4.09
320 VDC	Rated Power ① ③	P _{rtid}	Hp	-	2.85	3.90	4.96	-	3.08	3.94	5.37	3.12	3.82	5.53	3.17	4.56	5.49
		N _{rtid}	rpm	1800	3500	6000	-	1200	3000	4000	5000	2000	3000	4500	2000	2500	3500
560 VDC	Rated Torque ① ③ ⑤	T _{rtid}	N-m	10.2	8.75	5.45	-	14.7	12.7	11.1	9.35	17.0	15.4	11.7	20.0	19.0	15.8
		P _{rtid}	kW	1.91	3.21	3.42	-	1.84	3.97	4.63	4.90	3.55	4.82	5.49	4.18	4.96	5.77
640 VDC	Rated Power ① ③	P _{rtid}	Hp	2.56	4.30	4.59	-	2.47	5.33	6.20	6.56	4.76	6.46	7.36	5.60	6.65	7.74
		N _{rtid}	rpm	2000	4500	6000	-	1500	3500	4500	6000	2500	3500	5500	2200	3000	4000
75 VDC	Rated Torque ① ③ ⑤	T _{rtid}	N-m	10.0	7.75	5.45	-	14.4	11.8	10.3	6.75	16.1	14.2	8.75	19.5	17.9	14.5
		P _{rtid}	kW	2.08	3.65	3.42	-	2.25	4.31	4.83	4.24	4.20	5.19	5.04	4.48	5.61	6.05
160 VDC	Rated Power ① ③	P _{rtid}	Hp	2.79	4.90	4.59	-	3.02	5.77	6.47	5.69	5.63	6.95	6.76	6.01	7.52	8.11
		N _{rtid}	rpm	2000	4500	6000	-	1500	3500	4500	6000	2500	3500	5500	2200	3000	4000
Inertia (includes resolver)	J _m	kg-cm ²	17				24				32			40			
		lb-in-s ²	0.015				0.021				0.028			0.035			
Brake Inertia (additional)	J _m	kg-cm ²	0.61				0.61				0.61			0.61			
		lb-in-s ²	5.40E-04				5.40E-04				5.40E-04			5.40E-04			
Static Friction (includes shaft seal)	T _f	N-m	0.300				0.350				0.400			0.450			
		In-lb	2.66				3.10				3.54			3.99			
Viscous Damping	K _{dv}	N-m / k _{rpm}	0.04				0.06				0.08			0.1			
		lb-in / k _{rpm}	0.35				0.53				0.71			0.9			
Weight ⑥	W	Kg	9.18				11.4				13.6			15.7			
		Lb	20.2				25.0				29.9			34.5			
Thermal Time Constant	TCT	minutes	20				25				30			35			
Thermal Resistance	R _{th}	°C / Watt	0.46				0.41				0.38			0.35			
Heat Sink Size	Aluminum	inch	18" x 18" x 1/2"				18" x 18" x 1/2"				18" x 18" x 1/2"			18" x 18" x 1/2"			
Poles Pair			5				5				5			5			
Maximum Mechanical Speed ④	N _{max}	rpm	6,000				6,000				6,000			6,000			

Notes:

① Motor Performance based on ΔT = 100°C in a 40°C ambient (winding temp = 140°C) with listed Heat Sink.

② Motor Parameters BEMF, Resistance, and Inductance measured at 25°C.

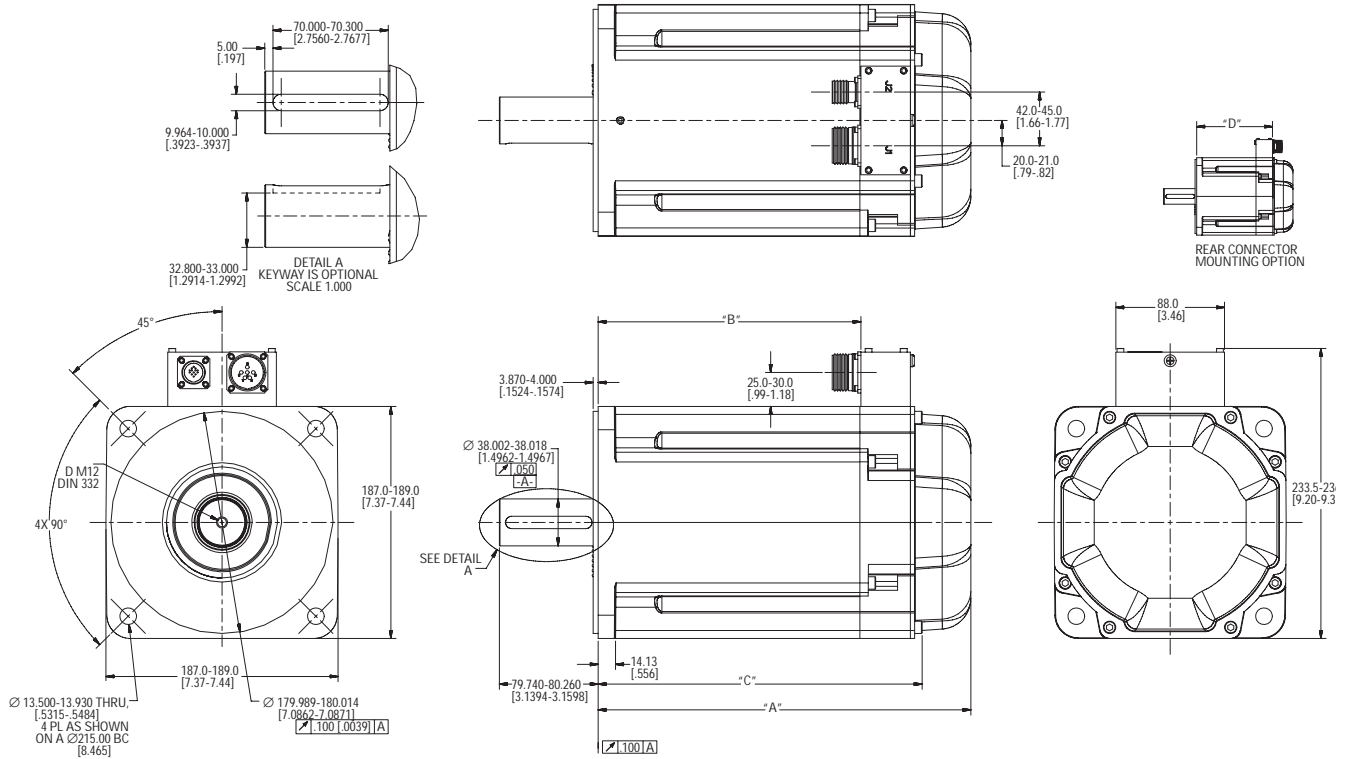
③ All data referenced to sinusoidal commutation.

④ Speed may be limited by V_{bus}.

⑤ Brake option reduces continuous torque by: EKM62 = 0.5 N-m EKM63 = 0.9 N-m EKM64 = 1.3 N-m EKM65 = 1.7 N-m

⑥ Motor weight does not include brake option.

Performance Data - EKM7x Frame



Model	"A"	"B"	"C"	"D"
EKM72	232.92 - 234.92	142.85 - 145.29	193.42 - 195.42	182.85 - 185.29
EKM73	266.92 - 268.92	176.85 - 179.29	227.42 - 229.42	216.85 - 219.29
EKM74	300.92 - 302.92	210.85 - 213.29	261.42 - 263.42	250.85 - 253.29

Dimensions are in mm [inches].
 Product designed in metric.
 English conversions provided for reference only.

Performance Data - EKM7x Frame

EKM7x - Up to 640 VDC

See system data beginning on page 6 for typical torque/speed performance.

Performance & Parameters	Symbol	Units	EKM72			EKM73		EKM74	
			Windings			Windings		Windings	
			K	M	P	M	P	L	P
Max Rated Bus Voltage	V _{bus}	V _{dc}	640	640	640	640	640	640	640
Continuous (Stall) Torque ⑤	T _{cs}	N-m	29.5	29.8	29.2	41.8	41.4	52.8	52.3
		lb-in	261	263	258	370	366	467	463
Continuous (Stall) Current	I _{cs}	A _{rms}	9.30	13.0	18.7	13.6	19.5	12.9	18.5
		A _{dc}	11.4	15.9	22.9	16.7	23.9	15.8	22.7
Peak Torque	T _p	N-m	79.0	79.5	78.3	113	111	143	142
		lb-in	700	704	693	1001	983	1266	1258
Peak Current	I _p	A _{rms}	27.8	38.9	56.1	40.8	58.6	38.7	55.5
		A _{dc}	34.1	47.7	68.7	50.0	71.8	47.4	68.0
Torque Constant at 140°C	K _t	N-m / A _{rms}	3.23	2.33	1.58	3.10	2.13	4.14	2.84
		lb-in / A _{rms}	28.6	20.6	14.0	27.5	18.9	36.7	25.2
BEMF Constant ②	K _e	V _{rms} / K _{rpm}	208	150	102	200	137	266	183
Resistance ②	R _m	Ohms	1.36	0.69	0.35	0.76	0.38	0.93	0.47
Inductance ②	mH	mH	21	11	5.0	12	5.9	16	7.7
75 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	-	-	-	-
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	-	-	-
	lb-in		-	-	-	-	-	-	-
	Rated Power ① ③	P _{rtid}	kW	-	-	-	-	-	-
Hp			-	-	-	-	-	-	
160 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	-	-	-	-
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	-	-	-
	lb-in		-	-	-	-	-	-	-
	Rated Power ① ③	P _{rtid}	kW	-	-	-	-	-	-
Hp			-	-	-	-	-	-	
320 VDC	Rated Speed ① ③	N _{rtid}	rpm	-	-	1800	-	1300	-
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	-	-	23.6	-	34.5
	lb-in		-	-	209	-	305	-	
	Rated Power ① ③	P _{rtid}	kW	-	-	4.44	-	4.69	-
Hp			-	-	5.95	-	6.29	-	
560 VDC	Rated Speed ① ③	N _{rtid}	rpm	1500	2000	3000	1500	2400	1200
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	24.9	23.4	19.9	33.6	28.3
	lb-in		220	207	176	297	250	383	348
	Rated Power ① ③	P _{rtid}	kW	3.90	4.89	6.24	5.27	7.10	5.43
Hp			5.23	6.56	8.36	7.06	9.52	7.29	
640 VDC	Rated Speed ① ③	N _{rtid}	rpm	1800	2500	3500	1800	2800	1400
		Rated Torque ① ③ ⑤	T _{rtid}	N-m	23.8	21.9	18.0	31.9	26.1
	lb-in		210	194	159	282	231	365	316
	Rated Power ① ③	P _{rtid}	kW	4.48	5.72	6.58	6.00	7.64	6.05
Hp			6.00	7.67	8.82	8.05	10.24	8.11	
Inertia (includes resolver)	J _m	kg-cm ²	65			92		120	
		lb-in-s ²	0.057			0.082		0.110	
Brake Inertia (additional)	J _m	kg-cm ²	1.64			1.64		1.64	
		lb-in-s ²	1.46E-03			1.46E-03		1.46E-03	
Static Friction (includes shaft seal)	T _f	N-m	0.41			0.49		0.58	
		lb-in	3.63			4.34		5.14	
Viscous Damping	K _{dv}	N-m / k _{rpm}	0.06			0.13		0.2	
		lb-in / k _{rpm}	0.5			1.2		1.8	
Weight ⑥	W	Kg	20.0			27.0		33.9	
		lb	44.0			59.4		74.6	
Thermal Time Constant	TCT	minutes	46			53		60	
Thermal Resistance	R _{th}	°C / Watt	0.39			0.33		0.30	
Heat Sink Size	Aluminum	inch	18" x 18" x 1/2"			18" x 18" x 1/2"		18" x 18" x 1/2"	
Poles Pair			5			5		5	
Maximum Mechanical Speed ④	N _{max}	rpm	6,000			6,000		6,000	

Notes:

① Motor Performance based on ΔT = 100°C in a 40°C ambient (winding temp = 140°C) with listed Heat Sink.

② Motor Parameters BEMF, Resistance, and Inductance measured at 25°C.

③ All data referenced to sinusoidal commutation.

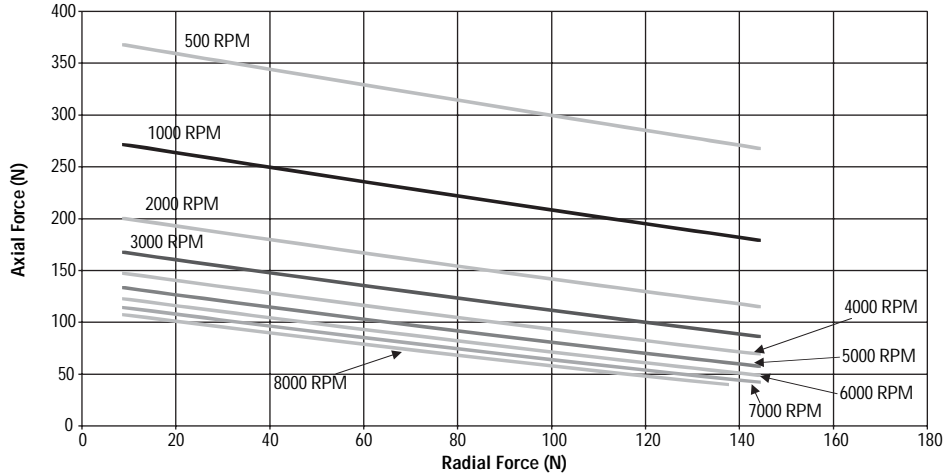
④ Speed may be limited by V_{bus}.

⑤ Brake option reduces continuous torque by 1.0 N-m

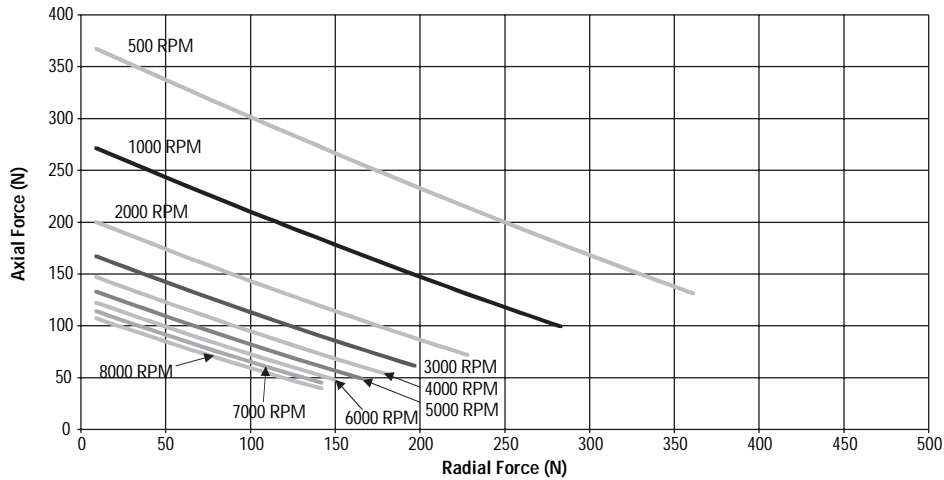
⑥ Motor weight does not include brake option.

Bearing Fatigue Life L_{10}

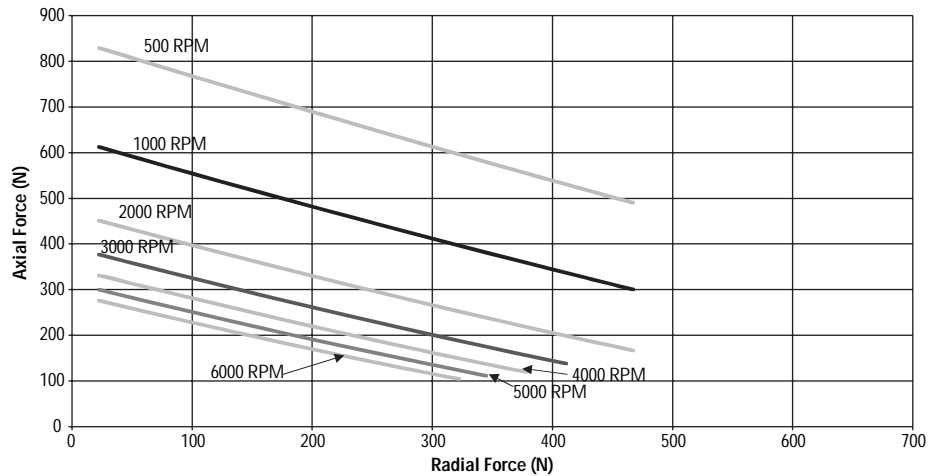
EKM2 MOTORS
20,000 HOURS L_{10} BEARING LIFE



EKM3 MOTORS
20,000 HOURS L_{10} BEARING LIFE

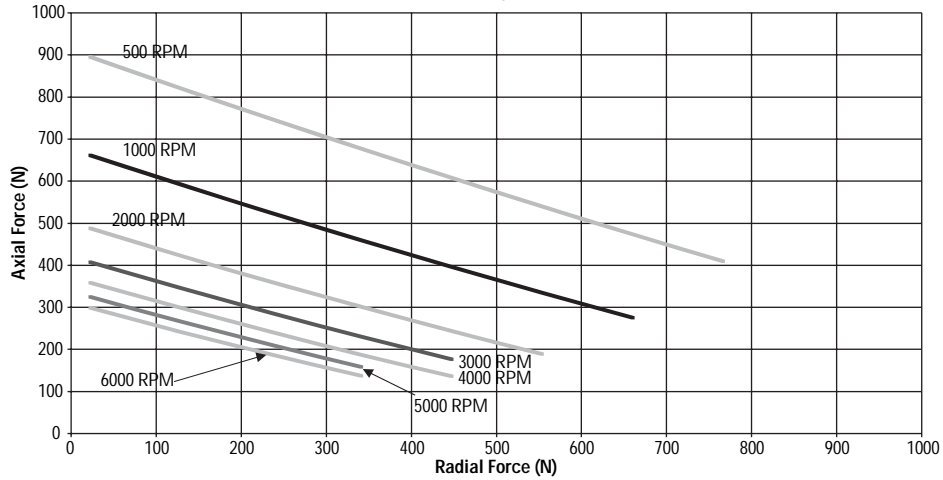


EKM4 MOTORS
20,000 HOURS L_{10} BEARING LIFE

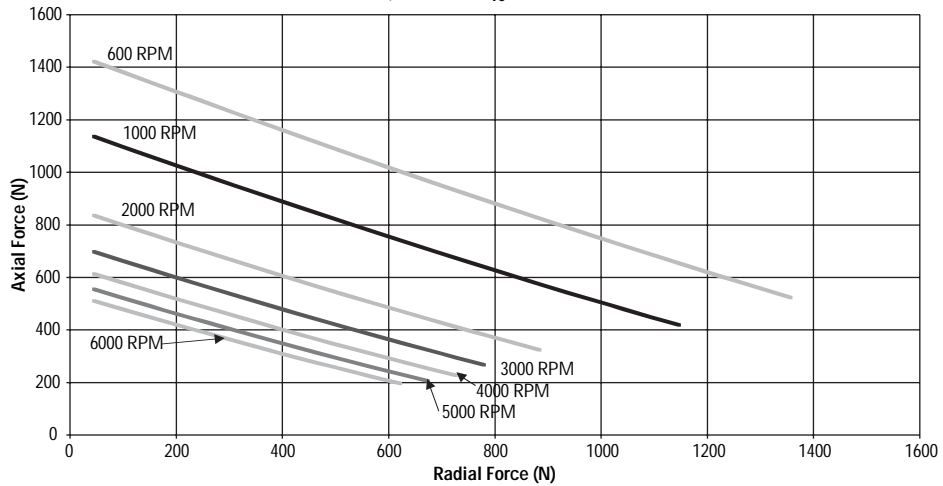


Bearing Fatigue Life L_{10}

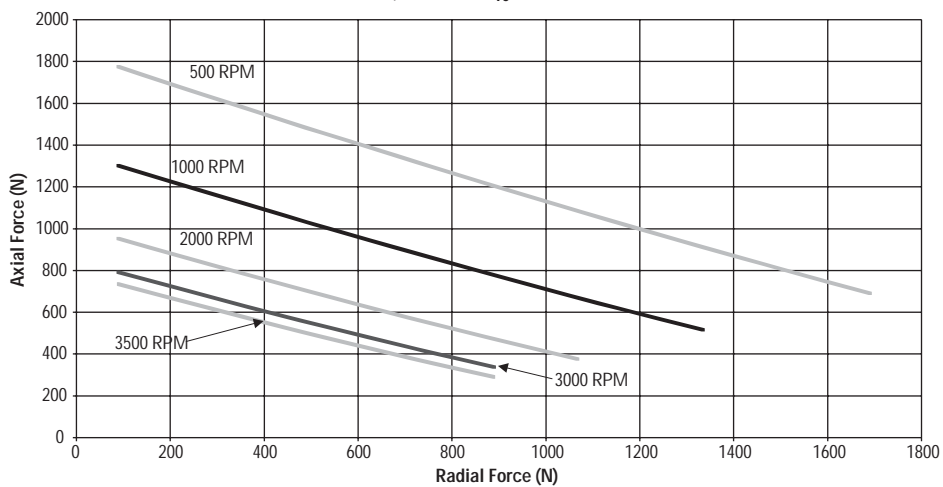
EKM5 MOTORS
20,000 HOURS L_{10} BEARING LIFE



EKM6 MOTORS
20,000 HOURS L_{10} BEARING LIFE



EKM7 MOTORS
20,000 HOURS L_{10} BEARING LIFE



Shaft Fatigue Rating

Motor	Max. Radial Force (N)	Max. Axial Force (N)
EKM2	150	600
EKM3	340	600
EKM4	500	1400
EKM5	830	1740
EKM6	1940	2200
EKM7	2300	3000

The maximum radial load ratings reflect the following assumptions:

1. Motors are operated with peak torque of the longest member of the frame size.
2. Fully reversed load applied to the end of the smallest diameter standard mounting shaft extension.
3. Infinite life with 99% reliability.
4. Safety factor = 2.

Notes

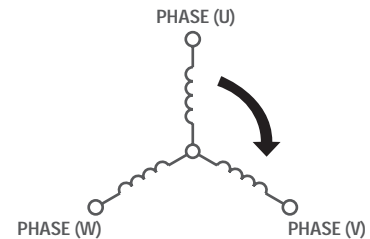
EKM Motor Resolver Feedback Details

Phasing Diagram - All Motors

General notes:

- 1 When motor is rotated CW (viewed from drive shaft end), these waveforms result: Voltage U , leads V , leads W. Voltage U-W leads Voltage V-W by 60° electrical.
- 2 PTC thermistor (155°C ± 5°C switching temperature) installed. Resistance at 25°C: ≤550 ohms. Switching Resistance: ≥1330 ohms within ±5°C of switch temperature.
- 3 Standard outline drawings showing mounting dimensions and standard winding information are available on our Web site at www.danahermotion.com or by calling the Danaher Motion Assistance Center at 1-540-633-3400.

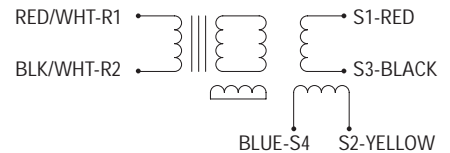
Motor Winding Configuration



Resolver (Primary Feedback)

Resolver Data	Units	EKM 2, 3, 4	EKM 5, 6, 7
Type		1 Speed	1 Speed
Input Voltage	V _{rms}	7.0	8.0
Frequency	k Hz	10	8.0
Input Current Max.	mA	32	52
Transformation Ratio	10%	0.5	0.5
Null Voltage	mV _{rms}	50	30
Max. Error (pk-pk)	MINS.	16	20
Phase Shift	DEG	-9°	-3°
Operating Temperature	°C	-55° to 155°	-55° to 155°
Rotor Inertia Max.	kg cm ²	0.046	0.497

Resolver Winding Configuration



$$ER1-R2 = ESIN(\omega T)$$

$$ES1-S3 = KER1-R2 SIN\theta$$

$$ES2-S4 = KER1-R2 COS\theta$$

Resolver Alignment

With positive DC current into phase W and out of phase V (U floats) the resolver is aligned to electrical ±5 counts. ie. Voltage S1-S3 set to null voltage S2-S4 max in phase with reference (R1-R2).

Failsafe, Holding Brake

The holding brake is designed to provide static holding torque to the motor shaft with the brake coil de-energized. The brake must first be released (coil energized) prior to commanding motor rotation as determined by its drop-out time. The brake is intended for holding or “parking” of a stationary motor. Not intended for dynamic braking. There should be absolutely no motion of the rotor when power is removed from the brake coil.

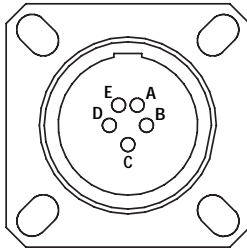
EKM Motor Brake Options

Motor Family	Minimum Static Torque @120°C		Weight		Power Consumption @24V, 20°C	Current @24V, 20°C	Inertia		Closing Time (engage)	Opening Time (release)	Backlash ²	
	N-m	lb-in	Kg	lbs			Watts ±7%	ADC			kgcm2	lb-in-sec2
EKM2	1.42	12.6	0.27	0.59	8.4	0.35	0.011	0.97E-05	18	20	1.01	0.46
EKM3	2.5	22.1	0.35	0.77	10.1	0.42	0.011	0.97E-05	10	25	1.01	0.46
EKM4	5.3	46.9	0.63	1.39	12.8	0.53	0.068	6.02E-05	15	35	0.81	0.37
EKM5	14.5	128	1.1	2.42	19.5	0.82	0.173	1.53E-05	15	80	0.71	0.31
EKM6	25	221	2	4.4	25.7	1.07	0.605	5.35E-05	20	105	0.51	0.24
EKM7	53	469	2.9	6.38	35.6	1.48	1.644	1.46E-05	35	110	0.44	0.20

1. Operating Voltage: 24 VDC +/- 10%.
 2. Maximum backlash is calculated using worst-case tolerancing, and typical backlash is calculated using statistical tolerancing.

EKM Motor Connector & Feedback Pinouts

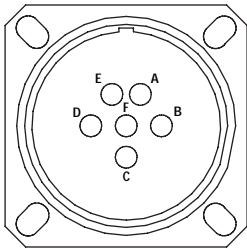
Connector Options

**Power Connector**

D38999/20FB5PN

EKM 2X, 3X, 4X

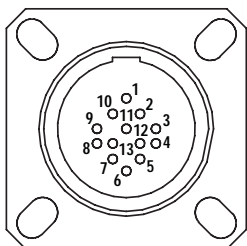
Pin	Function	Color
A	Motor A	Blue
B	Motor B	Brown
C	Motor C	Violet
D	Ground	Green/Yellow
E	Filler Pin	N/C

**Power Connector**

D38999/20FE6PN

EKM 5X, 6X, 7X

Pin	Function	Color
A	Motor A	Blue
B	Motor B	Brown
C	Motor C	Violet
D	Ground	Green/Yellow
E	Filler Pin	N/C
F	Filler Pin	N/C

**Signal Connector**

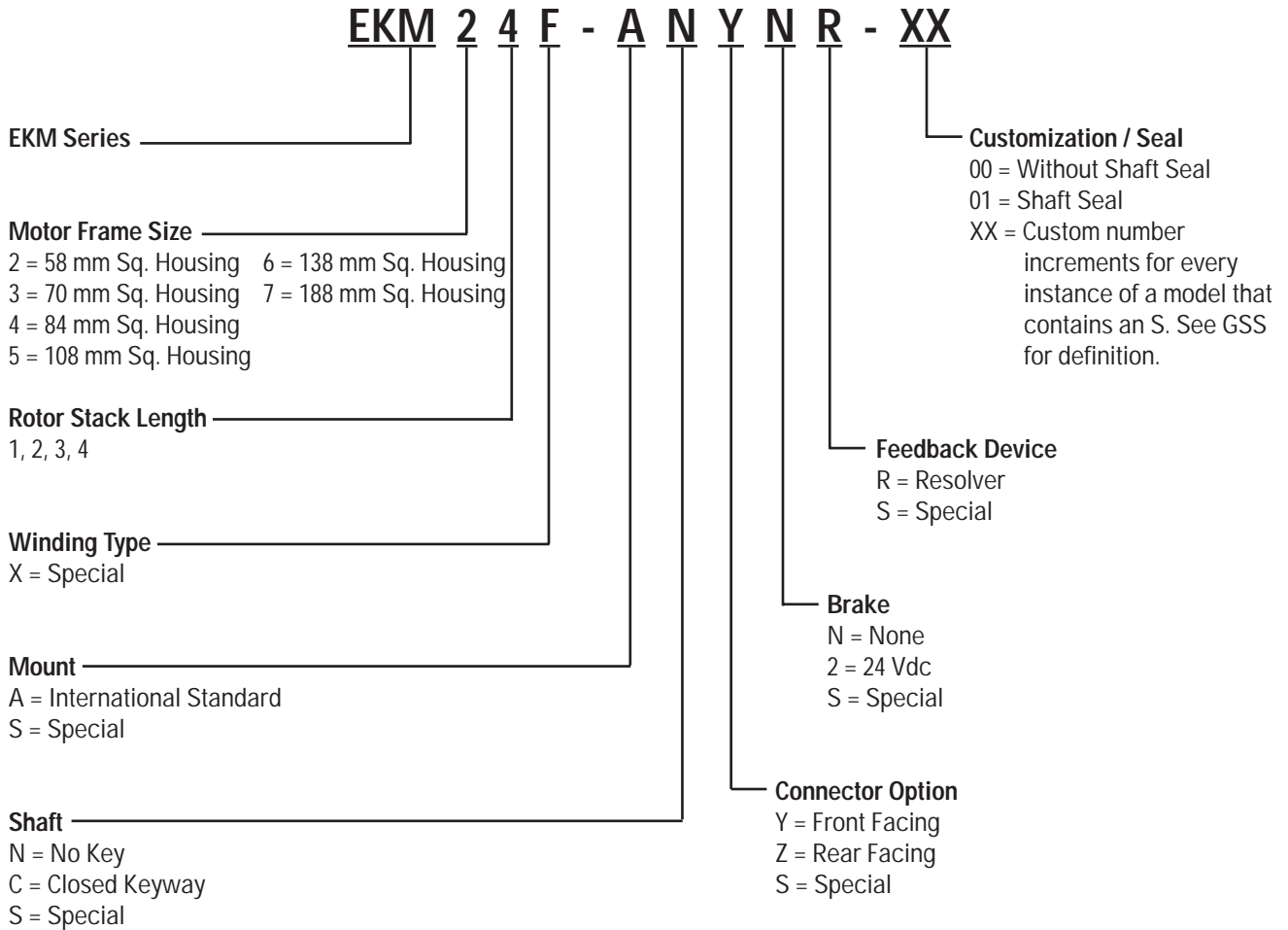
D38999/20FB35PN

EKM 2X, 3X, 4X, 5X, 6X, 7X

Pin	Function	Color
1	Filler Pin	N/C
2	Thermistor	Blue
3	S4: COS (-)	Blue
4	S3: SIN (-)	Black
5	R2: REF (-)	Black/White
6	Thermistor	Black
7	S2: COS (+)	Yellow
8	S1: SIN (+)	Red
9	R1: REF (+)	Red/White
10	Filler Pin	N/C
11	Brake (+)	Black
12	Brake (-)	Black
13	Filler Pin	N/C

EKM Part Numbering System

EKM Series Brushless Servomotors





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