AKM SERIES MOTORS

March 2005

www.DanaherMotion.com

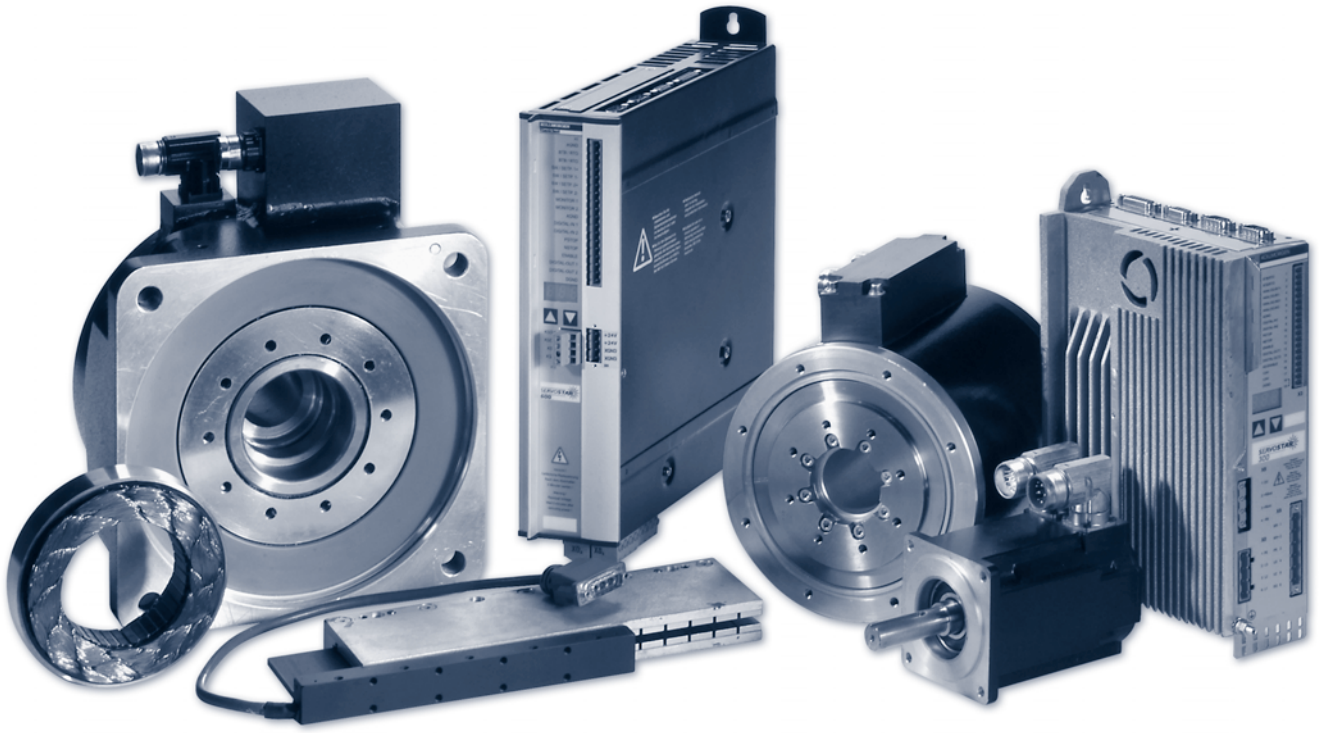
Advanced, High Performance Brushless AC Servomotors

The advanced Kollmorgen AKM high performance motor series offers a wide range of mounting, connectivity, feedback and other options.

KOLLMORGEN

Solutions by DANAHER MOTION

SELECTION



Solutions by DANAHER MOTION

New Name, Established Brands

Danaher Motion's wide range of motion control systems and components offer customers an unprecedented choice in selecting the right solution for their particular application requirements. Our product innovations have been improving the efficiency and productivity of complex manufacturing operations for over 60 years through trusted brand names such as Dover, Kollmorgen, Pacific Scientific, Portescap and Thomson in industries as diverse as semiconductor, aerospace and defense, mobile-off-highway, packaging, medical and robotics.

Danaher Motion's growing family of leading motion control products tells only half the story. With a worldwide service and support infrastructure, our field service engineers and support teams are available when you need them. It is part of the Danaher Corporation's unrelenting focus on you, our customer. That's why more and more design engineers are turning to Danaher Motion to meet their motion control requirements.

Kollmorgen AKM Motors and Drives – Choice Without Compromise.

Our new Kollmorgen AKM servo motors and drives from Danaher Motion give you unprecedented choice and flexibility from a wide range of standard products so you can select the best servo motor and drive combination optimized for your specifications. Now, selecting the right motion control products has never been easier. Pick from thousands of servo motor/drive combinations outlined in this catalog or go to our Web site to find the best solution for your application. Standard Kollmorgen AKM servo motors and drives offer the best of both worlds – the exact specifications of a custom solution with the faster delivery times and lower cost of a standard catalog product. For your truly unique motion control applications, work with our engineering support team to customize a solution for your machine design. Either way, standard product or customized, you choose the motion control solution that meets your exact requirements.

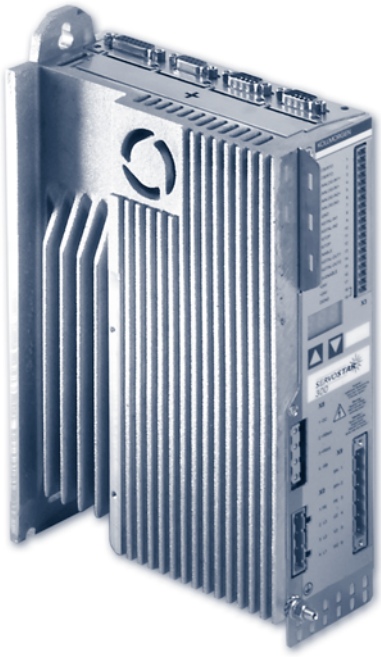
Continuous Improvement – It's the Danaher Way

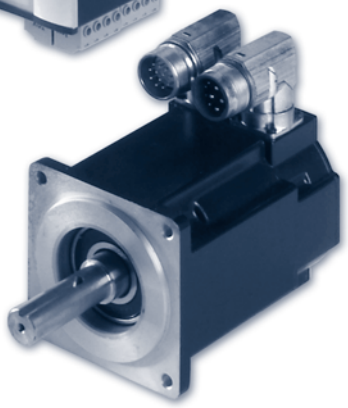
At Danaher, we are passionate about continually improving our operations to bring increasing value to our customers. The Danaher Business System (DBS) helps us improve the efficiency of our manufacturing and product development processes. DBS is a team-based approach based on the principles of Kaizen that lets us continuously and aggressively eliminate waste in every aspect of our business operations. The DBS focuses our entire organization on achieving breakthrough results that create competitive advantage in quality, delivery and performance – advantages that we pass on to you, our customer.

Whatever your motion control requirements may be, Danaher Motion has a solution that is right for you. Our unsurpassed product selection and service means faster time to market, higher reliability and increased productivity. Let the experts at Danaher Motion put a world of motion control solutions at your fingertips.

Your World in Motion. Control It.

Solutions by DANAHER MOTION





Solutions by DANAHER MOTION

A World of Options.

This Selection Guide outlines the extensive options available with this new advanced motor family. Use this guide to choose from our vast breadth of motor solutions. Our motor products are backed by a complete family of digital drives, offering you the best motion control solution in the marketplace.

Can't find what you're looking for? Beyond the Advanced Kollmorgen Motor series, Danaher Motion offers many other outstanding products, from Direct Drive Rotary and Linear products, to stepper and synchronous solutions. Even better, Danaher Motion can engineer the right solution for your needs. Ask our Customer Support Center today about a custom solution that fits your needs. Let the experts at Danaher Motion put a world of solutions at your fingertips.

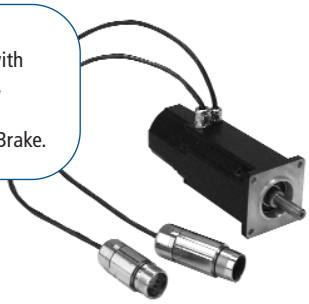
www.DanaherMotion.com

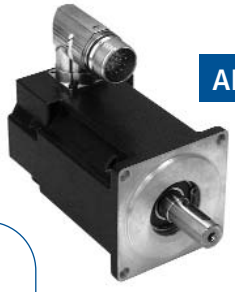
AKM11x

The AKM1 Frame Size with "M" option connectivity and SFD (Smart Feedback Device) Feedback.

AKM22x

The AKM2 Frame Size with "C" option connectivity, Commutating Encoder Feedback and optional Brake.



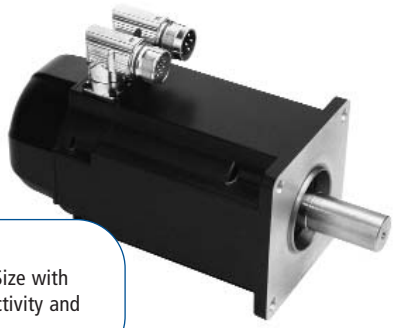


AKM31x

The AKM3 Frame Size with "D" option connectivity and SFD (Smart Feedback Device) Feedback.

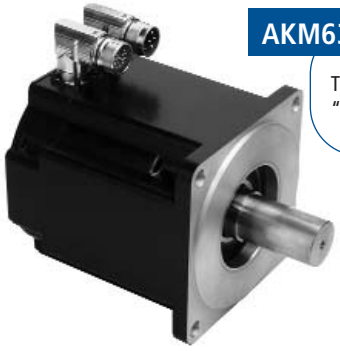
AKM41x

The AKM4 Frame Size with "P" option connectivity and SFD (Smart Feedback Device) Feedback.



AKM52x

The AKM5 Frame Size with "C" option connectivity and optional Brake.



AKM63x

The AKM6 Frame Size with "C" option connectivity.

AKM74x

The AKM7 Frame Size with "C" option connectivity and optional Brake.

Table of Contents:

The advanced Kollmorgen AKM high performance motor series offers a wide range of mounting, connectivity, feedback and other options. These motors offer superb flexibility to meet application needs with:

- 7 frame sizes
- 25 frame/stack combinations
- 77 'standard' windings

AKM motors offer extremely high torque, density and acceleration

Torque
0.16 to 53Nm continuous stall torque (1.4 to 470lb-in) in 25 frame/stack combinations. Specific torques are often available from multiple frame sizes to optimize mounting and inertia matching capabilities.

Speed
Speeds to 8000 rpm meet high speed application requirements. Windings specifically tailored to lower speeds are also available.

Voltage
AKM motors can be applied to all standard global voltages. Windings are specifically tailored to 75 VDC, 120, 240, 400 and 480 VAC.

Mounting
Multiple mounting standards are available to meet common European, North American, and Japanese standards.

Feedback
AKM motors include resolver, encoder (commutating), Sine-Absolute encoder or SFD (Smart Feedback Device) feedback options to meet specific application requirements.

Smoothness
Smooth performance results from low-cog, low-harmonic distortion magnetic designs.

Connectivity
Rugged, rotatable IP65 connectors and low cost IP20 Molex plugs are both available to provide flexibility. Single connectors/Plugs (combined power and feedback) are also available to minimize motor and cable cost (SFD only).

Thermal
Windings are rated conservatively at 100ºC rise over a 40ºC ambient while using 155ºC (class F) insulation materials. Motors meet applicable cURus and CE requirements and include thermistors. Thermal ratings at 60°C rise are also provided to meet the needs of specific applications.

Danaher Motion Cables Offer The Complete Solution

Factory cables are provided for your convenience and offer high reliability to keep your application running day and night. The new "Value" line provides a cost saving option for applications that don't require long distances or encounter extreme environmental conditions. Included in our new "Value" line is a composite cable that combines power and feedback in one cable to aid in faster machine commissioning. Please consult your local sales person or contact the Danaher Motion Customer Support Center to decide which cable option is best suited for your application.

Additional motion control solutions are available with these options.

- Fail-safe brakes
- Shaft seals
- Feedback devices
- Shaft and mounting variations
- Custom windings
- Connectivity

S200 Series Drives

The S200 is the next generation micro servo drive from Danaher Motion. This compact, high performance drive family supports torque or velocity control in the base configuration. An option card is available to provide position loop closure with indexing, CANopen or DeviceNet support. It is available in AC and DC powered versions and mates with the new AKM servomotors series, which features a smart feedback device that in conjunction with the drive provides auto set-up and tuning which reduces installation time and cost, as well as startup time when the motor or drive is replaced.

Features

- Highest performance all digital servo in the industry
- Easy set up and tuning with Smart Feedback Device
- Optimized performance with AKM motors
- Fully Protected
- Rugged optically isolated I/O
- Meets CE and UL Requirements
- Full Digital Design
- Very compact footprint
- Choice of motor feedback options
- Torque and Velocity control standard
- Optional CANopen or DeviceNet Position Control
- Optional CANopen Support

S300 and S600 Series Drives

The Kollmorgen SERVOSTAR® S300 series is Danaher Motion's full feature, compact drive for 3-10 amp continuous applications. Utilizing the same design features as the established SERVOSTAR® S600 family it offers users all the performance and compatibility of the larger S600 series in a smaller package and is available for 120 VAC and single phase input power applications.

The SERVOSTAR® S600 series is a high performance, high power drive incorporating advanced features for three phase input applications on 208-480 VAC power systems. Available in 3 to 70 amp continuous ratings it provides coverage for a wide range of motors.

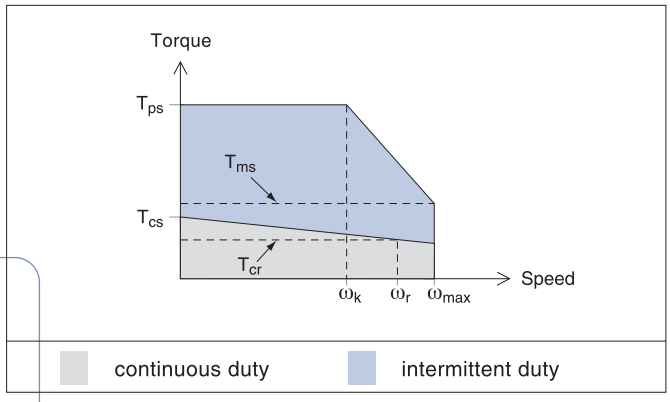
Both the S300 and S600 support the new AKM series servomotors as well as the Kollmorgen GOLDLINE® DDR and PLATINUM® DDL series. The S600 also supports the Kollmorgen GOLDLINE® XT and Kollmorgen GOLDLINE® BH series of motors to meet the widest range of requirements.

All S300 and S600 drives support plug-in option cards for I/O expansion, DeviceNet, PROFIBUS, SERCOS and Single Axis Controller capability.

Features

- Fully Protected
- Meets CE and UL Requirements
- Full Digital Design
- Small footprint with built-in CE filters standard for 3-20 amp units
- Choice of motor feedback options
- Torque, Velocity and Position Control standard
- Optional DeviceNet, Profibus, SERCOS
- Optional Single-axis controller
- Standard built-in CANopen Support
- Motion Tasking tied to I/O support polling
- Advanced Setup software and onboard display with keypad

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 servo motor/controller combination. The nominal values in this data illustrate performance for the recommended motor/controller systems.

Definitions

T_{ps}	-	Peak stall torque for system
T_{ms}	-	Peak torque at maximum speed
T_{cs}	-	Continuous torque at stall
T_{cr}	-	Continuous rated torque (torque at rated power)
ω_{max}	-	Maximum speed
ω_r	-	Rated speed (speed at rated power)
ω_k	-	Speed at knee in peak envelope (intersection of system peak torque with voltage limit line)

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.

MOTIONEERING® CD-ROM

Don't let sizing and selection slow down your process. MOTIONEERING Application Engine sizing software from Danaher Motion makes it a breeze.

MOTIONEERING is a Windows®-based program that takes a systems approach to the selection of servo and stepper products. This approach to sizing systems considers not only load and motor parameters in the sizing process but also the amplifier voltage and current parameters including the amplifier time constant to deliver peak current.

A wide variety of mechanisms are accommodated including leadscrew, rack and pinion, conveyor, nip rolls, rotary, and direct data entry. Direct Drive Linear (DDL) motors have their own unique sizing algorithms and product databases to search from. The database consists of over 1500 systems including housed brushless and DC servos, frameless brushless servos, direct drive linear brushless servos, stepper motors, and drives.

A separate tutorial is available on the CD-ROM or from the Web site to aid first time users in the use of the software.

Also included on the MOTIONEERING CD-ROM are over 60 of our latest product catalogs in PDF format for easy viewing. A literature browser allows these PDF documents to be quickly found by product category and brand. In addition, the CD-ROM provides company and general product introductions consistent with those in this Selection Guide. Lastly, there is a software tool included on the CD-ROM called MOTIONEERING Toolbar, a general purpose engineering utility that includes a unit converter, inertia calculations, density of materials listing and more.

Recommended Motor/Drive Systems, 75 VDC bus ①

Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at 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	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A_{rms}	Current@Peak Torque I_{ps} A_{rms}	Inertia ③ J kg-cm^2 (lb-in-s^{2}x 10^{-3})
AKM11E	S20330	0.50 (4.45)	0.264 (2.34)	0.19 (1.64)	0.18 (1.56)	3,530	6,000	8,000	2.91	9.0	0.017 (0.015)
AKM12E	S20330	0.90 (8.0)	0.0 (0.0)	0.30 (2.69)	0.30 (2.68)	1,380	3,000	7,180	2.72	9.0	0.031 (0.0274)
AKM13D	S20330	1.29 (11.4)	0.0 (0.0)	0.40 (3.55)	0.40 (3.55)	0	2,000	4,750	2.4	9.0	0.045 (0.0398)
AKM21E	S20330	1.21 (10.7)	0.0 (0.0)	0.48 (4.23)	0.48 (4.21)	1,320	2,000	5,050	3.0	9.0	0.107 (0.0947)
AKM21G	S20630	1.44 (12.7)	0.0 (0.0)	0.50 (4.43)	0.46 (4.05)	2,350	4,000	7,800	4.87	18.0	0.107 (0.0947)
AKM22E	S20330	2.34 (20.7)	0.0 (0.0)	0.87 (7.71)	0.85 (7.55)	0	1,000	2,540	2.73	9.0	0.161 (0.143)
AKM22G	S20630	2.66 (23.6)	0.0 (0.0)	0.88 (7.79)	0.84 (7.39)	1,150	2,500	4,420	4.82	18.0	0.161 (0.143)
AKM23F	S20630	3.88 (34.4)	0.0 (0.0)	1.18 (10.4)	1.15 (10.1)	352	1,500	2,940	4.31	17.2	0.216 (0.191)
AKM24F	S20630	4.82 (42.6)	0.0 (0.0)	1.42 (12.6)	1.39 (12.3)	28	1,000	2,210	3.89	15.6	0.27 (0.239)
AKM31E	S20330	3.24 (28.6)	0.0 (0.0)	1.20 (10.6)	1.19 (10.5)	118	750	1,990	2.99	9.0	0.33 (0.292)
AKM31H	S20630	3.36 (29.7)	0.0 (0.0)	1.23 (10.9)	1.20 (10.6)	1,520	2,000	3,780	5.85	18.0	0.33 (0.292)
AKM32H	S20630	6.22 (55.1)	0.0 (0.0)	2.10 (18.6)	2.06 (18.2)	634	1,200	2,090	5.5	18.0	0.59 (0.522)
AKM33H	S20630	8.56 (75.8)	0.0 (0.0)	2.88 (25.5)	2.82 (25.0)	383	800	1,550	5.62	18.0	0.85 (0.752)
AKM41H	S20630	5.48 (48.5)	0.0 (0.0)	2.06 (18.2)	1.99 (17.6)	604	1,000	2,190	5.6	18.0	0.81 (0.717)

Recommended Motor/Drive Systems, 120 VAC, 160 VDC bus ①

AKM11B	S20260	0.59 (5.27)	0.179 (1.58)	0.18 (1.62)	0.18 (1.60)	290	4,000	8,000	1.16	4.5	0.017 (0.015)
AKM11C	S20260	0.51 (4.49)	0.30 (2.66)	0.19 (1.64)	0.18 (1.56)	4,160	6,000	8,000	1.45	4.5	0.017 (0.015)
AKM12C	S20260	0.85 (7.49)	0.071 (0.628)	0.31 (2.73)	0.30 (2.69)	3,120	4,000	8,000	1.50	4.5	0.031 (0.0274)
AKM12E	S20360	0.90 (8.0)	.090 (8.0)	0.30 (2.69)	0.27 (2.42)	8,000	8,000	8,000	2.72	9.0	0.031 (0.0274)
AKM13C	S20260	1.16 (10.3)	0.0 (0.0	0.41 (3.62)	0.41 (3.60)	2,110	3,000	6,160	1.48	4.5	0.045 (0.0398)
AKM13D	S20360	1.37 (12.1)	0.624 (5.52)	0.40 (3.55)	0.36 (3.23)	4,560	7,000	8,000	2.4	9.0	0.045 (0.0398)
AKM21C	S20260	1.17 (10.4)	0.0 (0.0)	0.45 (3.98)	0.45 (3.98)	1,810	2,500	5,630	1.50	4.5	0.107 (0.0947)
AKM21E	S20360	1.21 (10.7)	0.695 (6.15)	0.48 (4.23)	0.41 (3.65)	5,330	7,000	8,000	3.0	9.0	0.107 (0.0947)
AKM22C	S20260	2.34 (20.7)	0.0 (0.0)	0.84 (7.48)	0.83 (7.32)	187	1,000	2,830	1.39	4.5	0.161 (0.143)
AKM22E	S20360	2.42 (21.4)	0.0 (0.0)	0.87 (7.71)	0.81 (7.13)	2,240	3,500	5,410	2.73	9.0	0.161 (0.143)
AKM23C	S20260	3.20 (28.4)	0.0 (0.0)	1.13 (10.0)	1.11 (9.81)	53	1,000	2,130	1.41	4.5	0.216 (0.191)
AKM23D	S20360	3.84 (33.9)	0.0 (0.0)	1.16 (10.2)	1.12 (9.93)	638	1,500	3,270	2.19	8.8	0.216 (0.191)
AKM24D	S20360	4.76 (42.1)	0.0 (0.0)	1.41 (12.4)	1.36 (12.1)	529	1,500	2,710	2.21	8.8	0.27 (0.239)
AKM31E	S20360	3.24 (28.6)	0.0 (0.0)	1.2 (10.7)	1.17 (10.4)	1,940	2,500	4,240	2.99	9.0	0.33 (0.292)
AKM32D	S20360	7.05 (62.4)	0.0 (0.0)	2.04 (18.0)	2.00 (17.7)	165	1,000	1,870	2.23	8.9	0.59 (0.522)
AKM41E	S20360	5.33 (47.2)	0.0 (0.0)	2.02 (17.8)	1.94 (17.2)	778	1,200	2,430	2.85	9.0	0.81 (0.717)

Recommended Motor/Drive Systems, 240 VAC, 320 VDC bus ①

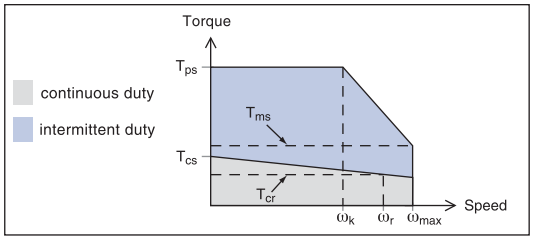
AKM11B	S20260	0.59 (5.27)	0.59 (5.27)	0.18 (1.62)	0.17 (1.47)	8,000	8,000	8,000	1.16	4.5	0.017 (0.015)
AKM12C	S20260	0.85 (7.49)	0.85 (7.43)	0.31 (2.73)	0.28 (2.47)	8,000	8,000	8,000	1.50	4.5	0.031 (0.0274)
AKM13C	S20260	1.16 (10.3)	1.06 (9.38)	0.41 (3.62)	0.36 (3.22)	7,600	8,000	8,000	1.48	4.5	0.045 (0.0398)
AKM21C	S20260	1.17 (10.4)	0.75 (6.64)	0.45 (3.98)	0.39 (3.42)	5,810	8,000	8,000	1.50	4.5	0.107 (0.0947)
AKM22C	S20260	2.34 (20.7)	0.0 (0.0)	0.84 (7.48)	0.78 (6.92)	2,470	3,500	5,660	1.39	4.5	0.161 (0.143)
AKM22E	S20360	2.42 (21.4)	1.61 (14.2)	0.87 (7.71)	0.70 (6.18)	6,010	8,000	8,000	2.73	9.0	0.161 (0.143)
AKM23C	S20260	3.2 (28.4)	0.0 (0.0)	1.13 (10.0)	1.08 (9.52)	1,900	2,500	4,270	1.41	4.5	0.216 (0.191)
AKM23D	S20360	3.84 (34.0)	0.0 (0.0)	1.16 (10.2)	1.03 (9.08)	3,020	5,000	6,540	2.19	8.8	0.216 (0.191)
AKM24C	S20260	3.94 (34.9)	0.0 (0.0)	1.38 (12.2)	1.32 (11.7)	1,620	2,000	3,540	1.42	4.5	0.27 (0.239)
AKM24D	S20360	4.76 (42.1)	0.0 (0.0)	1.41 (12.4)	1.29 (11.4)	2,620	4,000	5,420	2.21	8.8	0.27 (0.239)
AKM31C	S20260	3.34 (29.6)	0.0 (0.0)	1.15 (10.2)	1.12 (9.94)	1,630	2,500	4,060	1.37	4.5	0.33 (0.292)
AKM31E	S20360	3.24 (28.6)	0.77 (6.82)	1.2 (10.6)	0.95 (8.41)	5,000	6,000	8,000	2.99	9.0	0.33 (0.292)
AKM32C	S20260	5.74 (50.8)	0.0 (0.0)	2.0 (17.7)	1.95 (17.2)	1,010	1,500	2,470	1.44	4.5	0.59 (0.522)
AKM32D	S20360	7.05 (62.4)	0.0 (0.0)	2.04 (18.0)	1.93 (17.1)	1,670	2,500	3,750	2.23	8.9	0.59 (0.522)
AKM33C	S20260	7.83 (69.3)	0.0 (0.0)	2.71 (24.0)	2.64 (23.4)	689	1,000	1,840	1.47	4.5	0.85 (0.752)
AKM33E	S20360	8.95 (79.3)	0.0 (0.0)	2.79 (24.7)	2.62 (23.2)	1,640	2,000	3,140	2.58	9.0	0.85 (0.752)
AKM41C	S20260	5.12 (45.3)	0.0 (0.0)	1.95 (17.3)	1.88 (16.6)	880	1,200	2,560	1.46	4.5	0.81 (0.717)
AKM41E	S20360	5.33 (47.2)	0.0 (0.0)	2.02 (17.8)	1.82 (16.1)	2,140	3,000	4,850	2.85	9.0	0.81 (0.717)
AKM42E	S20360	9.72 (86.0)	0.0 (0.0)	3.42 (30.3)	3.12 (27.6)	1,260	1,800	2,740	2.74	9.0	1.45 (1.28)
AKM43E	S20360	13.6 (120)	0.0 (0.0)	4.7 (41.6)	4.24 (37.6)	937	1,500	2,000	2.76	9.0	2.09 (1.85)
AKM44E	S20360	16.5 (146)	0.0 (0.0)	5.76 (51.0)	5.2 (46.0)	834	1,200	1,680	2.85	9.0	2.73 (2.42)

① See detailed motor specifications beginning on page 16.
② Peak torque ratings are for 5 seconds.
③ Includes resolver feedback inertia.

Recommended Motor/Drive Systems, 240 VAC, 320 VDC bus ①

Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at 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	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A rms	Current@Peak Torque I_{ps} A rms	Inertia ③ J kg-cm^2 (lb-in-s^2 x 10^{-3})
AKM11B	S30361	0.61 (5.39)	0.584 (5.17)	0.18 (1.62)	0.17 (1.47)	7,700	8,000	8,000	1.16	4.7	0.017 (0.015)
AKM12C	S30361	1.08 (9.54)	1.05 (9.29)	0.31 (2.74)	0.28 (2.47)	7,880	8,000	8,000	1.51	6.1	0.031 (0.0274)
AKM13C	S30361	1.46 (12.9)	1.06 (9.38)	0.41 (3.62)	0.36 (3.22)	6,080	8,000	8,000	1.48	5.9	0.045 (0.0398)
AKM22E	S30361	2.42 (21.4)	1.61 (14.2)	0.87 (7.71)	0.7 (6.18)	6,010	8,000	8,000	2.73	9.0	0.161 (0.143)
AKM23D	S30361	3.84 (34)	0.0 (0.0)	1.16 (10.2)	1.03 (9.08)	3,020	5,000	6,540	2.19	8.8	0.216 (0.191)
AKM23F	S30661	3.52 (31.2)	3.28 (29.0)	1.18 (10.4)	0.94 (8.28)	7,670	8,000	8,000	4.31	15.0	0.216 (0.191)
AKM24D	S30361	4.76 (42.1)	0.0 (0.0)	1.41 (12.4)	1.29 (11.4)	2,620	4,000	5,420	2.21	8.8	0.27 (0.239)
AKM24F	S30661	4.68 (41.4)	2.42 (21.4)	1.42 (12.6)	1.12 (9.91)	5,570	8,000	8,000	3.89	15.0	0.27 (0.239)
AKM31E	S30361	3.24 (28.6)	0.77 (6.82)	1.2 (10.7)	0.95 (8.41)	5,000	6,000	8,000	2.99	9.0	0.33 (0.292)
AKM32D	S30361	7.05 (62.4)	0.0 (0.0)	2.04 (18.0)	1.93 (17.1)	1,670	2,500	3,750	2.23	8.9	0.59 (0.522)
AKM32H	S30661	5.36 (47.5)	2.87 (25.4)	2.1 (18.6)	1.45 (12.8)	6,560	7,000	8,000	5.5	15.0	0.59 (0.522)
AKM33E	S30361	8.95 (79.3)	0.0 (0.0)	2.79 (24.7)	2.62 (23.2)	1,640	2,000	3,140	2.58	9.0	0.85 (0.752)
AKM33H	S30661	7.35 (65.0)	0.0 (0.0)	2.88 (25.5)	2.27 (20.1)	5,040	5,500	6,630	5.62	15.0	0.85 (0.752)
AKM41E	S30361	5.33 (47.2)	0.0 (0.0)	2.02 (17.8)	1.82 (16.1)	2,140	3,000	4,850	2.85	9.0	0.81 (0.717)
AKM41H	S30661	4.78 (42.3)	3.8 (33.6)	2.06 (18.2)	1.62 (14.3)	5,070	6,000	6,000	5.6	15.0	0.81 (0.717)
AKM42E	S30361	9.72 (86.0)	0.0 (0.0)	3.42 (30.3)	3.12 (27.6)	1,260	1,800	2,740	2.74	9.0	1.45 (1.28)
AKM42G	S30661	9.56 (84.6)	0.0 (0.0)	3.53 (31.2)	2.9 (25.7)	2,530	3,500	4,660	4.8	15.0	1.45 (1.28)
AKM42J	S31061	7.75 (68.6)	6.52 (57.7)	3.56 (31.5)	2.38 (21.0)	5,460	6,000	6,000	8.4	20.0	1.45 (1.28)
AKM43G	S30661	13.2 (116)	0.0 (0.0)	4.8 (42.5)	4.0 (35.4)	2,000	2,500	3,470	4.87	15.0	2.09 (1.85)
AKM43K	S31061	9.66 (85.5)	5.44 (48.1)	4.9 (43.4)	2.62 (23.2)	5,120	6,000	6,000	9.6	20.0	2.09 (1.85)
AKM44G	S30661	16.1 (142)	0.0 (0.0)	5.88 (52.0)	4.9 (43.4)	1,760	2,000	2,890	5	15.0	2.73 (2.42)
AKM44J	S31061	12.9 (114)	0.0 (0.0)	6.0 (53.1)	3.84 (34)	3,800	4,000	5,010	8.8	20.0	2.73 (2.42)
AKM51G	S30661	11.7 (104)	0.0 (0.0)	4.75 (42.1)	4.03 (35.6)	1,910	2,500	3,480	4.84	14.5	3.42 (3.03)
AKM51K	S31061	9.22 (81.6)	4.43 (39.2)	4.9 (43.4)	2.35 (20.8)	4,740	5,500	6,000	9.4	20.0	3.42 (3.03)
AKM52G	S30661	21.5 (191)	0.0 (0.0)	8.43 (74.6)	7.69 (68.1)	1,110	1,500	1,920	4.72	14.2	6.22 (5.51)
AKM52K	S31061	16.9 (150)	0.0 (0.0)	8.6 (76.1)	6.8 (60.2)	2,820	3,000	3,690	9.3	20.0	6.22 (5.51)
AKM53K	S31061	22.9 (203)	0.0 (0.0)	11.6 (103)	10.1 (88.9)	2,220	2,000	2,780	9.4	20.0	9.12 (8.07)
AKM54K	S31061	28.1 (249)	0.0 (0.0)	14.4 (127)	12.7 (112)	1,880	1,800	2,290	9.7	20.0	11.9 (10.6)
AKM62K	S31061	22.7 (201)	0.0 (0.0)	12.2 (108)	10.4 (92)	1,870	2,000	2,700	9.6	20.0	16.9 (15.0)
AKM63K	S31061	31 (274)	0.0 (0.0)	16.8 (149)	14.9 (131)	1,510	1,500	2,020	9.9	20.0	24.2 (21.4)

① See definitions of ratings beginning on page 8.
② Peak torque ratings are for 5 seconds.
③ Includes resolver feedback inertia.



Recommended Motor/Drive Systems, 400 VAC, 560 VDC bus ①

Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at 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	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A rms	Current@Peak Torque I_{ps} A rms	Inertia ③ J kg-cm^2 (lb-in-s^2 x 10^{-3})
AKM22C	S30101	2.34 (20.7)	1.3 (11.5)	0.84 (7.48)	0.68 (5.99)	5,510	8,000	8,000	1.39	4.5	0.161 (0.143)
AKM23C	S30101	3.20 (28.4)	0.0 (0.0)	1.13 (10.0)	0.99 (8.79)	4,370	5,500	7,470	1.41	4.5	0.216 (0.191)
AKM23D	S30301	3.42 (30.2)	2.84 (25.1)	1.16 (10.2)	0.92 (8.11)	7,040	8,000	8,000	2.19	7.5	0.216 (0.191)
AKM24C	S30101	3.94 (34.9)	0.0 (0.0)	1.38 (12.2)	1.25 (11.0)	3,780	4,500	6,200	1.42	4.5	0.27 (0.239)
AKM24D	S30301	4.22 (37.3)	2.51 (22.2)	1.41 (12.4)	1.11 (9.81)	6,130	8,000	8,000	2.21	7.5	0.27 (0.239)
AKM31C	S30101	3.34 (29.6)	0.0 (0.0)	1.15 (10.2)	1.00 (8.86)	3,820	5,000	7,110	1.37	4.5	0.33 (0.292)
AKM32C	S30101	5.74 (50.8)	0.0 (0.0)	2.00 (17.7)	1.86 (16.5)	2,540	3,000	4,320	1.44	4.5	0.59 (0.522)
AKM32D	S30301	6.18 (54.7)	0.0 (0.0)	2.04 (18.0)	1.65 (14.6)	4,150	5,500	6,570	2.23	7.5	0.59 (0.522)
AKM33C	S30101	7.83 (69.3)	0.0 (0.0)	2.71 (24.0)	2.54 (22.5)	1,900	2,000	3,230	1.47	4.5	0.85 (0.752)
AKM33E	S30301	7.70 (68.2)	0.0 (0.0)	2.79 (24.7)	2.34 (20.7)	3,920	4,500	5,490	2.58	7.5	0.85 (0.752)
AKM41C	S30101	5.12 (45.3)	0.0 (0.0)	1.95 (17.3)	1.77 (15.6)	2,000	3,000	4,490	1.46	4.5	0.81 (0.717)
AKM41E	S30301	4.64 (41.0)	3.33 (29.5)	2.02 (17.8)	1.58 (14.0)	4,710	6,000	6,000	2.85	7.5	0.81 (0.717)
AKM42C	S30101	9.37 (82.9)	0.0 (0.0)	3.35 (29.6)	3.10 (27.4)	1,150	1,500	2,510	1.4	4.5	1.45 (1.28)
AKM42E	S30301	8.41 (74.4)	0.0 (0.0)	3.42 (30.3)	2.81 (24.9)	2,900	3,500	4,790	2.74	7.5	1.45 (1.28)
AKM42G	S30601	7.99 (70.7)	6.79 (60.1)	3.53 (31.2)	2.35 (20.8)	5,440	6,000	6,000	4.8	12.0	1.45 (1.28)
AKM43E	S30301	11.7 (104)	0.0 (0.0)	4.70 (41.6)	3.92 (34.7)	2,210	2,500	3,500	2.76	7.5	2.09 (1.85)
AKM43G	S30601	10.9 (96.8)	1.18 (10.4)	4.80 (42.5)	3.01 (26.6)	4,290	5,000	6,000	4.87	12.0	2.09 (1.85)
AKM44E	S30301	14.1 (125)	0.0 (0.0)	5.76 (51.0)	4.80 (42.5)	1,970	2,000	2,950	2.85	7.5	2.73 (2.42)
AKM44G	S30601	13.3 (118)	0.0 (0.0)	5.88 (52.0)	3.76 (33.3)	3,760	4,000	5,060	5	12.0	2.73 (2.42)
AKM51E	S30301	10.9 (96.1)	0.0 (0.0)	4.70 (41.6)	3.98 (35.3)	2,070	2,500	3,510	2.75	7.5	3.42 (3.03)
AKM51G	S30601	10.2 (90.4)	1.29 (11.4)	4.75 (42.1)	2.62 (23.2)	4,060	5,000	6,000	4.84	12.0	3.42 (3.03)
AKM52E	S30301	18.5 (164)	0.0 (0.0)	8.34 (73.8)	7.61 (67.4)	1,440	1,500	2,160	2.99	7.5	6.22 (5.51)
AKM52G	S30601	18.9 (168)	0.0 (0.0)	8.43 (74.6)	7.06 (62.5)	2,370	2,500	3,360	4.72	12.0	6.22 (5.51)
AKM53G	S30601	25.8 (229)	0.0 (0.0)	11.4 (101)	9.85 (87.2)	1,860	2,000	2,520	4.77	12.0	9.12 (8.07)
AKM54G	S30601	31.7 (280)	0.0 (0.0)	14.3 (126)	12.9 (114)	1,600	1,500	2,090	4.98	12.0	11.9 (10.5)
AKM62G	S30601	25.6 (227)	0.0 (0.0)	11.9 (106)	10.7 (94.4)	1,530	1,800	2,440	4.85	12.0	16.9 (15)
AKM63G	S30601	38.4 (340)	0.0 (0.0)	16.5 (146)	15.3 (136)	1,030	1,200	1,630	4.48	12.0	24.2 (21.4)

Recommended Motor/Drive Systems, 480 VAC, 640 VDC bus ①

AKM22C	S30101	2.34 (20.7)	1.76 (15.5)	0.84 (7.48)	0.68 (5.99)	6,500	8,000	8,000	1.39	4.5	0.161 (0.143)
AKM23C	S30101	3.20 (28.4)	0.85 (7.51)	1.13 (10.0)	0.95 (8.39)	5,190	7,000	8,000	1.41	4.5	0.216 (0.191)
AKM23D	S30301	3.42 (30.2)	0.0 (0.0)	1.16 (10.2)	0.92 (8.11)	8,000	8,000	8,000	2.19	7.5	0.216 (0.191)
AKM24C	S30101	3.94 (34.9)	0.0 (0.0)	1.38 (12.2)	1.22 (10.8)	4,490	5,500	7,090	1.42	4.5	0.27 (0.239)
AKM24D	S30301	4.22 (37.3)	3.51 (31.1)	1.41 (12.4)	1.11 (9.81)	7,160	8,000	8,000	2.21	7.5	0.27 (0.239)
AKM31C	S30101	3.34 (29.6)	0.26 (2.34)	1.15 (10.2)	0.91 (8.07)	4,530	6,000	8,000	1.37	4.5	0.33 (0.292)
AKM32C	S30101	5.74 (50.8)	0.0 (0.0)	2.00 (17.7)	1.83 (16.2)	3,040	3,500	4,930	1.44	4.5	0.59 (0.522)
AKM32D	S30301	6.18 (54.7)	0.0 (0.0)	2.04 (18.0)	1.58 (14.0)	4,870	6,000	7,510	2.23	7.5	0.59 (0.522)
AKM33C	S30101	7.83 (69.3)	0.0 (0.0)	2.71 (24.0)	2.50 (22.1)	2,300	2,500	3,690	1.47	4.5	0.85 (0.752)
AKM33E	S30301	7.70 (68.2)	0.0 (0.0)	2.79 (24.7)	2.27 (20.1)	4,590	5,000	6,280	2.58	7.5	0.85 (0.752)
AKM41C	S30101	5.12 (45.3)	0.0 (0.0)	1.95 (17.3)	1.74 (15.4)	2,370	3,500	5,130	1.46	4.5	0.81 (0.717)
AKM41E	S30301	4.64 (41.0)	4.08 (36.1)	2.02 (17.8)	1.58 (14.0)	5,440	6,000	6,000	2.85	7.5	0.81 (0.717)
AKM42C	S30101	9.37 (82.9)	0.0 (0.0)	3.35 (29.6)	3.02 (26.8)	1,380	2,000	2,870	1.4	4.5	1.45 (1.28)
AKM42E	S30301	8.41 (74.4)	0.0 (0.0)	3.42 (30.3)	2.72 (24.0)	3,370	4,000	5,480	2.74	7.5	1.45 (1.28)
AKM43E	S30301	11.7 (104)	0.0 (0.0)	4.70 (41.6)	3.76 (33.3)	2,570	3,000	4,000	2.76	7.5	2.09 (1.85)
AKM43G	S30601	10.9 (96.8)	6.75 (59.7)	4.80 (42.5)	2.57 (22.7)	4,950	6,000	6,000	4.87	12.0	2.09 (1.85)
AKM44E	S30301	14.1 (125)	0.0 (0.0)	5.76 (51.0)	4.56 (40.4)	2,300	2,500	3,370	2.85	7.5	2.73 (2.42)
AKM44G	S30601	13.3 (118)	0.0 (0.0)	5.88 (52.0)	3.19 (28.2)	4,350	5,000	5,790	5	12.0	2.73 (2.42)
AKM51E	S30301	10.9 (96.1)	0.0 (0.0)	4.70 (41.6)	3.80 (33.6)	2,420	3,000	4,010	2.75	7.5	3.42 (3.03)
AKM51G	S30601	10.2 (90.4)	5.94 (52.6)	4.75 (42.1)	1.94 (17.2)	4,680	6,000	6,000	4.84	12.0	3.42 (3.03)
AKM52E	S30301	18.5 (164)	0.0 (0.0)	8.34 (73.8)	7.28 (64.4)	1,690	2,000	2,470	2.99	7.5	6.22 (5.51)
AKM52G	S30601	18.9 (168)	0.0 (0.0)	8.43 (74.6)	6.66 (59.0)	2,750	3,000	3,840	4.72	12.0	6.22 (5.51)
AKM53G	S30601	25.8 (229)	0.0 (0.0)	11.4 (101)	9.85 (87.2)	2,160	2,400	2,880	4.77	12.0	9.12 (8.07)
AKM54G	S30601	31.7 (280)	0.0 (0.0)	14.3 (126)	12.3 (109)	1,860	2,000	2,390	4.98	12.0	11.9 (10.5)
AKM62G	S30601	25.6 (227)	0.0 (0.0)	11.9 (106)	10.2 (90.1)	1,780	2,000	2,790	4.85	12.0	16.9 (15)
AKM63G	S30601	38.4 (340)	0.0 (0.0)	16.5 (146)	14.6 (129)	1,200	1,500	1,860	4.48	12.0	24.2 (21.4)

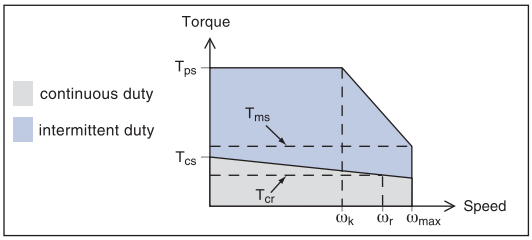
Recommended Motor/Drive Systems, 240 VAC, 320 VDC bus ①

Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at 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	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A_{rms}	Current@Peak Torque I_{ps} A_{rms}	Inertia ③ J kg-cm^2 (lb-in-s^2 x 10^{-3})
AKM11B	S60300	0.61 (5.39)	0.584 (5.17)	0.18 (1.62)	0.17 (1.47)	7,700	8,000	8,000	1.16	4.7	0.017 (0.015)
AKM12C	S60300	1.07 (9.47)	1.06 (9.38)	0.31 (2.74)	0.28 (2.47)	7,950	8,000	8,000	1.51	6.0	0.031 (0.0274)
AKM13C	S60300	1.46 (12.9)	1.06 (9.38)	0.41 (3.62)	0.36 (3.22)	6,080	8,000	8,000	1.48	5.9	0.045 (0.0398)
AKM22E	S60300	1.76 (15.6)	1.61 (14.2)	0.87 (7.71)	0.70 (6.18)	7,750	8,000	8,000	2.73	6.0	0.161 (0.143)
AKM23D	S60300	2.87 (25.4)	0.0 (0.0)	1.16 (10.2)	1.03 (9.08)	4,090	5,000	6,540	2.19	6.0	0.216 (0.191)
AKM23F	S60600	2.96 (26.2)	2.96 (26.2)	1.18 (10.4)	0.94 (8.28)	8,000	8,000	8,000	4.31	12.0	0.216 (0.191)
AKM24D	S60300	3.52 (31.2)	0.0 (0.0)	1.41 (12.4)	1.29 (11.4)	3,500	4,000	5,420	2.21	6.0	0.27 (0.239)
AKM24F	S60600	3.94 (34.9)	2.41 (21.3)	1.42 (12.6)	1.12 (9.91)	6,410	8,000	8,000	3.89	12.0	0.27 (0.239)
AKM32D	S60300	5.14 (45.5)	0.0 (0.0)	2.04 (18.0)	1.93 (17.1)	2,330	2,500	3,750	2.23	6.0	0.59 (0.522)
AKM33E	S60300	6.35 (56.2)	0.0 (0.0)	2.79 (24.7)	2.62 (23.2)	2,170	2,000	3,140	2.58	6.0	0.85 (0.752)
AKM41E	S60300	3.87 (34.2)	0.0 (0.0)	2.02 (17.8)	1.82 (16.1)	2,930	3,000	4,850	2.85	6.0	0.81 (0.717)
AKM41H	S60600	3.99 (35.3)	3.83 (33.9)	2.06 (18.2)	1.62 (14.3)	5,900	6,000	6,000	5.6	12.0	0.81 (0.717)
AKM42E	S60300	6.97 (61.7)	0.0 (0.0)	3.42 (30.3)	3.12 (27.6)	1,730	1,800	2,740	2.74	6.0	1.45 (1.28)
AKM42G	S60600	7.99 (70.7)	0.0 (0.0)	3.53 (31.2)	2.9 (25.7)	2,950	3,500	4,660	4.8	12.0	1.45 (1.28)
AKM42J	S61000	7.75 (68.6)	6.52 (57.7)	3.56 (31.5)	2.38 (21.0)	5,460	6,000	6,000	8.4	20.0	1.45 (1.28)
AKM42J	S610-3000	10.7 (94.5)	6.52 (57.7)	3.56 (31.5)	2.38 (21.0)	4,160	6,000	6,000	8.4	30.0	1.45 (1.28)
AKM43E	S60300	9.67 (85.6)	0.0 (0.0)	4.7 (41.6)	4.24 (37.6)	1,280	1,500	2,000	2.76	6.0	2.09 (1.85)
AKM43G	S60600	10.9 (96.8)	0.0 (0.0)	4.8 (42.5)	4.0 (35.4)	2,310	2,500	3,470	4.87	12.0	2.09 (1.85)
AKM43K	S61000	9.66 (85.5)	5.44 (48.1)	4.9 (43.4)	2.62 (23.2)	5,120	6,000	6,000	9.6	20.0	2.09 (1.85)
AKM43K	S610-3000	13.6 (120)	5.41 (47.9)	4.9 (43.4)	2.62 (23.2)	4,090	6,000	6,000	9.6	30.0	2.09 (1.85)
AKM44E	S60300	11.6 (103)	0.0 (0.0)	5.76 (51)	5.2 (46)	1,120	1,200	1,680	2.85	6.0	2.73 (2.42)
AKM44G	S60600	13.3 (118)	0.0 (0.0)	5.88 (52.0)	4.9 (43.4)	2,010	2,000	2,890	5.0	12.0	2.73 (2.42)
AKM44J	S61000	12.9 (114)	0.0 (0.0)	6.0 (53.1)	3.84 (34)	3,800	4,000	5,010	8.8	20.0	2.73 (2.42)
AKM44J	S610-3000	18.1 (160)	0.0 (0.0)	6.0 (53.1)	3.84 (34)	3,030	4,000	5,010	8.8	30.0	2.73 (2.42)
AKM51E	S60300	9.14 (80.9)	0.0 (0.0)	4.7 (41.6)	4.41 (39)	1,210	1,200	2,010	2.75	6.0	3.42 (3.03)
AKM51G	S60600	10.2 (90.4)	0.0 (0.0)	4.75 (42.1)	4.03 (35.6)	2,180	2,500	3,480	4.84	12.0	3.42 (3.03)
AKM51K	S61000	9.22 (81.6)	4.47 (39.6)	4.9 (43.4)	2.35 (20.8)	4,740	5,500	6,000	9.4	20.0	3.42 (3.03)
AKM51K	S610-3000	12.0 (106)	4.45 (39.4)	4.9 (43.4)	2.35 (20.8)	3,830	5,500	6,000	9.4	28.3	3.42 (3.03)
AKM52G	S60600	18.9 (168)	0.0 (0.0)	8.43 (74.6)	7.69 (68.1)	1,240	1,500	1,920	4.72	12.0	6.22 (5.51)
AKM52K	S61000	16.9 (150)	0.0 (0.0)	8.6 (76.1)	6.8 (60.2)	2,820	3,000	3,690	9.3	20.0	6.22 (5.51)
AKM52K	S610-3000	21.9 (194)	0.0 (0.0)	8.6 (76.1)	6.8 (60.2)	2,370	3,000	3,690	9.3	27.8	6.22 (5.51)
AKM52M	S61400	16.7 (148)	0.0 (0.0)	8.6 (76.1)	5.2 (46.0)	4,110	4,500	5,230	13.1	28.0	6.22 (5.51)
AKM53G	S60600	25.8 (229)	0.0 (0.0)	11.4 (101)	10.7 (94.5)	959	1,000	1,440	4.77	12.0	9.12 (8.07)
AKM53K	S61000	22.9 (203)	0.0 (0.0)	11.6 (103)	10.1 (89)	2,220	2,000	2,780	9.4	20.0	9.12 (8.07)
AKM53K	S610-3000	30.2 (267)	0.0 (0.0)	11.6 (103)	10.1 (89)	1,880	2,000	2,780	9.4	28.1	9.12 (8.07)
AKM53M	S61400	22.1 (196)	0.0 (0.0)	11.4 (101)	8.72 (77.2)	3,360	3,000	4,050	13.4	28.0	9.12 (8.07)
AKM53P	S62000	22.2 (196)	0.0 (0.0)	11.4 (101)	5.88 (52.0)	4,900	5,000	5,770	19.1	40.0	9.12 (8.07)
AKM54K	S61000	28.1 (249)	0.0 (0.0)	14.4 (127)	12.7 (112)	1,880	1,800	2,290	9.7	20.0	11.9 (10.5)
AKM54K	S610-3000	38.4 (340)	0.0 (0.0)	14.4 (127)	12.7 (112)	1,590	1,800	2,290	9.7	29.2	11.9 (10.5)
AKM54L	S61400	29.5 (261)	0.0 (0.0)	14.1 (125)	11.5 (101)	2,500	2,500	3,040	12.5	28.0	11.9 (10.5)
AKM54N	S62000	29.6 (262)	0.0 (0.0)	14.1 (125)	9.85 (87.2)	3,580	3,500	4,320	17.8	40.0	11.9 (10.5)
AKM62K	S61000	22.7 (201)	0.0 (0.0)	12.2 (108)	10.4 (92)	1,870	2,000	2,700	9.6	20.0	16.9 (15)
AKM62K	S610-3000	30.1 (267)	0.0 (0.0)	12.2 (108)	10.4 (92)	1,480	2,000	2,700	9.6	28.7	16.9 (15)
AKM62M	S61400	22.8 (201)	0.0 (0.0)	12.2 (108)	9.5 (84.1)	2,650	3,000	3,770	13.4	28.0	16.9 (15)
AKM62P	S62000	23.2 (206)	0.0 (0.0)	12.3 (109)	8.1 (71.7)	3,760	4,500	5,250	18.8	40.0	16.9 (15)
AKM63K	S61000	31 (274)	0.0 (0.0)	16.8 (149)	14.9 (131)	1,510	1,500	2,020	9.9	20.0	24.2 (21.4)
AKM63K	S610-3000	42.6 (377)	0.0 (0.0)	16.8 (149)	14.9 (131)	1,200	1,500	2,020	9.9	29.7	24.2 (21.4)
AKM63M	S61400	31.4 (278)	0.0 (0.0)	17 (150)	14.3 (127)	2,120	2,000	2,770	13.8	28.0	24.2 (21.4)
AKM63N	S62000	34.8 (308)	0.0 (0.0)	17 (150)	13 (115)	2,550	3,000	3,500	17.4	40.0	24.2 (21.4)
AKM64K	S61000	41.2 (365)	0.0 (0.0)	20.8 (184)	19.2 (170)	1,120	1,200	1,510	9.2	20.0	31.6 (28)
AKM64L	S61400	41.9 (371)	0.0 (0.0)	21 (186)	18.4 (163)	1,590	1,500	2,080	12.8	28.0	31.6 (28)
AKM64P	S62000	40.2 (355)	0.0 (0.0)	20.4 (180)	16.0 (142)	2,480	2,500	3,120	18.6	40.0	31.6 (28)
AKM65K	S61000	46.8 (414)	0.0 (0.0)	24.8 (219)	22.8 (202)	1,060	1,000	1,350	9.8	20.0	40.0 (35.4)
AKM65M	S61400	47.6 (421)	0.0 (0.0)	25 (221)	21.9 (194)	1,500	1,500	1,860	13.6	28.0	40.0 (35.4)
AKM65N	S62000	50.2 (444)	0.0 (0.0)	24.3 (215)	19.8 (175)	1,980	2,000	2,500	17.8	40.0	40.0 (35.4)
AKM72P	S62000	58.4 (516)	0.0 (0.0)	29.4 (260)	23.8 (211)	1,590	1,800	2,170	18.7	40.0	64.5 (57.1)
AKM73P	S62000	79.4 (702)	0.0 (0.0)	41.6 (368)	34.7 (307)	1,250	1,300	1,610	19.5	40.0	92.1 (81.5)

Recommended Motor/Drive Systems, 400 VAC, 560 VDC bus ①

Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at 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	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A rms	Current@Peak Torque I_{ps} A rms	Inertia ③ J kg-cm^2 (lb-in-s^2 x 10^{-3})
AKM23D	S60300	2.87 (25.4)	2.87 (25.4)	1.16 (10.2)	0.92 (8.11)	8,000	8,000	8,000	2.19	6.0	0.216 (0.191)
AKM24D	S60300	3.52 (31.2)	2.48 (21.9)	1.41 (12.4)	1.11 (9.81)	6,930	8,000	8,000	2.21	6.0	0.27 (0.239)
AKM32D	S60300	5.14 (45.5)	0.0 (0.0)	2.04 (18.0)	1.65 (14.6)	4,710	5,500	6,570	2.23	6.0	0.59 (0.522)
AKM33E	S60300	6.35 (56.2)	0.0 (0.0)	2.79 (24.7)	2.34 (20.7)	4,330	4,500	5,490	2.58	6.0	0.85 (0.752)
AKM41E	S60300	3.87 (34.2)	3.29 (29.1)	2.02 (17.8)	1.58 (14.0)	5,470	6,000	6,000	2.85	6.0	0.81 (0.717)
AKM42E	S60300	6.97 (61.7)	0.0 (0.0)	3.42 (30.3)	2.81 (24.9)	3,320	3,500	4,790	2.74	6.0	1.45 (1.28)
AKM42G	S60600	7.99 (70.7)	6.71 (59.4)	3.53 (31.2)	2.35 (20.8)	5,440	6,000	6,000	4.8	12.0	1.45 (1.28)
AKM43E	S60300	9.67 (85.6)	0.0 (0.0)	4.7 (41.6)	3.92 (34.7)	2,510	2,500	3,500	2.76	6.0	2.09 (1.85)
AKM43G	S60600	10.9 (96.8)	1.25 (11.1)	4.8 (42.5)	3.01 (26.6)	4,290	5,000	6,000	4.87	12.0	2.09 (1.85)
AKM44E	S60300	11.6 (103)	0.0 (0.0)	5.76 (51)	4.8 (42.5)	2,210	2,000	2,950	2.85	6.0	2.73 (2.42)
AKM44G	S60600	13.3 (118)	0.0 (0.0)	5.88 (52.0)	3.76 (33.3)	3,760	4,000	5,060	5.0	12.0	2.73 (2.42)
AKM44J	S610-3000	18.1 (160)	16 (142)	6 (53.1)	2.75 (24.3)	5,550	6,000	6,000	8.8	30.0	2.73 (2.42)
AKM51E	S60300	9.14 (80.9)	0.0 (0.0)	4.7 (41.6)	3.98 (35.3)	2,380	2,500	3,510	2.75	6.0	3.42 (3.03)
AKM51G	S60600	10.2 (90.4)	1.26 (11.2)	4.75 (42.1)	2.62 (23.2)	4,060	5,000	6,000	4.84	12.0	3.42 (3.03)
AKM52E	S60300	15.4 (136)	0.0 (0.0)	8.34 (73.8)	7.61 (67.4)	1,620	1,500	2,160	3.0	6.0	6.22 (5.51)
AKM52G	S60600	18.9 (168)	0.0 (0.0)	8.43 (74.6)	7.06 (62.5)	2,370	2,500	3,360	4.72	12.0	6.22 (5.51)
AKM52K	S61000	16.9 (150)	8.52 (75.4)	8.6 (76.1)	3.9 (34.5)	5,120	5,500	6,000	9.3	20.0	6.22 (5.51)
AKM52K	S610-3000	21.9 (194)	8.54 (75.6)	8.6 (76.1)	3.9 (34.5)	4,340	5,500	6,000	9.3	27.8	6.22 (5.51)
AKM53G	S60600	25.8 (229)	0.0 (0.0)	11.4 (101)	9.85 (87.2)	1,860	2,000	2,520	4.77	12.0	9.12 (8.07)
AKM53K	S61000	22.9 (203)	0.0 (0.0)	11.6 (103)	7.65 (67.7)	4,050	4,000	4,860	9.4	20.0	9.12 (8.07)
AKM53K	S610-3000	30.2 (267)	0.0 (0.0)	11.6 (103)	7.65 (67.7)	3,480	4,000	4,860	9.4	28.1	9.12 (8.07)
AKM54G	S60600	31.7 (280)	0.0 (0.0)	14.3 (126)	12.9 (114)	1,600	1,500	2,090	5.0	12.0	11.9 (10.6)
AKM54K	S61000	28.1 (249)	0.0 (0.0)	14.4 (127)	10.1 (89)	3,440	3,500	4,020	9.7	20.0	11.9 (10.6)
AKM54K	S610-3000	38.4 (340)	0.0 (0.0)	14.4 (127)	10.1 (89)	2,950	3,500	4,020	9.7	29.2	11.9 (10.6)
AKM54L	S61400	29.5 (261)	0.0 (0.0)	14.1 (125)	8.13 (72)	4,540	4,500	5,320	12.5	28.0	11.9 (10.6)
AKM62G	S60600	25.6 (227)	0.0 (0.0)	11.9 (106)	10.4 (91.9)	1,530	1,800	2,440	4.85	12.0	16.9 (15)
AKM62K	S61000	22.7 (201)	0.0 (0.0)	12.2 (108)	9.01 (79.7)	3,390	3,500	4,720	9.6	20.0	16.9 (15)
AKM62K	S610-3000	30.1 (267)	0.0 (0.0)	12.2 (108)	9.01 (79.7)	2,720	3,500	4,720	9.6	28.7	16.9 (15)
AKM62M	S61400	22.8 (202)	11.4 (101)	12.2 (108)	5.74 (50.8)	4,770	6,000	6,000	13.4	28.0	16.9 (15)
AKM63G	S60600	38.4 (340)	0.0 (0.0)	16.5 (146)	15 (133)	1,030	1,200	1,630	4.48	12.0	24.2 (21.4)
AKM63K	S61000	31 (274)	0.0 (0.0)	16.8 (149)	12.9 (114)	2,760	3,000	3,530	9.9	20.0	24.2 (21.4)
AKM63K	S610-3000	42.6 (377)	0.0 (0.0)	16.8 (149)	12.9 (114)	2,230	3,000	3,530	9.9	29.7	24.2 (21.4)
AKM63M	S61400	31.4 (278)	0.0 (0.0)	17 (150)	11.3 (100)	3,830	4,000	4,850	13.8	28.0	24.2 (21.4)
AKM63N	S62000	34.8 (308)	7.75 (68.6)	17 (150)	9.6 (85)	4,580	5,000	6,000	17.4	40.0	24.2 (21.4)
AKM64K	S61000	41.2 (365)	0.0 (0.0)	20.8 (184)	17.2 (152)	2,080	2,000	2,650	9.2	20.0	31.6 (28)
AKM64K	S610-3000	53.5 (473)	0.0 (0.0)	20.8 (184)	17.2 (152)	1,770	2,000	2,650	9.2	27.5	31.6 (28)
AKM64L	S61400	41.9 (371)	0.0 (0.0)	21 (186)	15.6 (138)	2,900	3,000	3,640	12.8	28.0	31.6 (28)
AKM64P	S62000	40.2 (355)	0.0 (0.0)	20.4 (180)	11.9 (106)	4,470	4,500	5,460	18.6	40.0	31.6 (28)
AKM65K	S61000	46.8 (414)	0.0 (0.0)	24.8 (219)	20.2 (179)	1,960	2,000	2,370	9.8	20.0	40.0 (35.4)
AKM65K	S610-3000	64.5 (571)	0.0 (0.0)	24.8 (219)	20.2 (179)	1,640	2,000	2,370	9.8	29.4	40.0 (35.4)
AKM65M	S61400	47.6 (421)	0.0 (0.0)	25 (221)	19.2 (170)	2,710	2,500	3,250	13.6	28.0	40.0 (35.4)
AKM65N	S62000	50.2 (444)	0.0 (0.0)	24.3 (215)	16.0 (142)	3,590	3,500	4,370	17.8	40.0	40.0 (35.4)
AKM72K	S61000	59.4 (526)	0.0 (0.0)	29.7 (263)	25.1 (222)	1,350	1,500	1,860	9.3	20.0	64.5 (57.1)
AKM72K	S610-3000	79.2 (701)	0.0 (0.0)	29.7 (263)	25.1 (222)	1,110	1,500	1,860	9.3	27.8	64.5 (57.1)
AKM72M	S61400	59.8 (529)	0.0 (0.0)	30 (266)	23.6 (209)	1,900	2,000	2,590	13	28.0	64.5 (57.1)
AKM72P	S62000	58.4 (516)	0.0 (0.0)	29.4 (260)	20.1 (178)	2,850	3,000	3,800	18.7	40.0	64.5 (57.1)
AKM73M	S61400	80.7 (714)	0.0 (0.0)	42 (372)	33.8 (299)	1,510	1,500	1,940	13.6	28.0	92.1 (81.5)
AKM73P	S62000	79.4 (702)	0.0 (0.0)	41.6 (368)	28.5 (252)	2,240	2,400	2,830	19.5	40.0	92.1 (81.5)
AKM74L	S61400	108 (952)	0.0 (0.0)	53 (469)	45.5 (403)	1,120	1,200	1,460	12.9	28.0	120.0 (106)
AKM74P	S62000	106 (936)	0.0 (0.0)	52.5 (464)	37.6 (333)	1,680	1,800	2,120	18.5	40.0	120.0 (106)

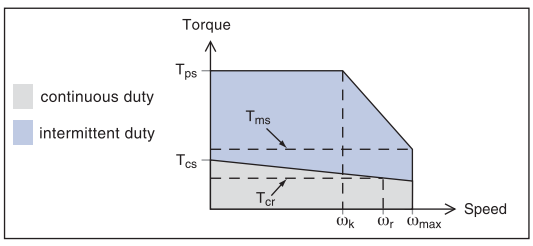
① See definitions of ratings beginning on page 8.
② Peak torque ratings are for 5 seconds.
③ Includes resolver feedback inertia.



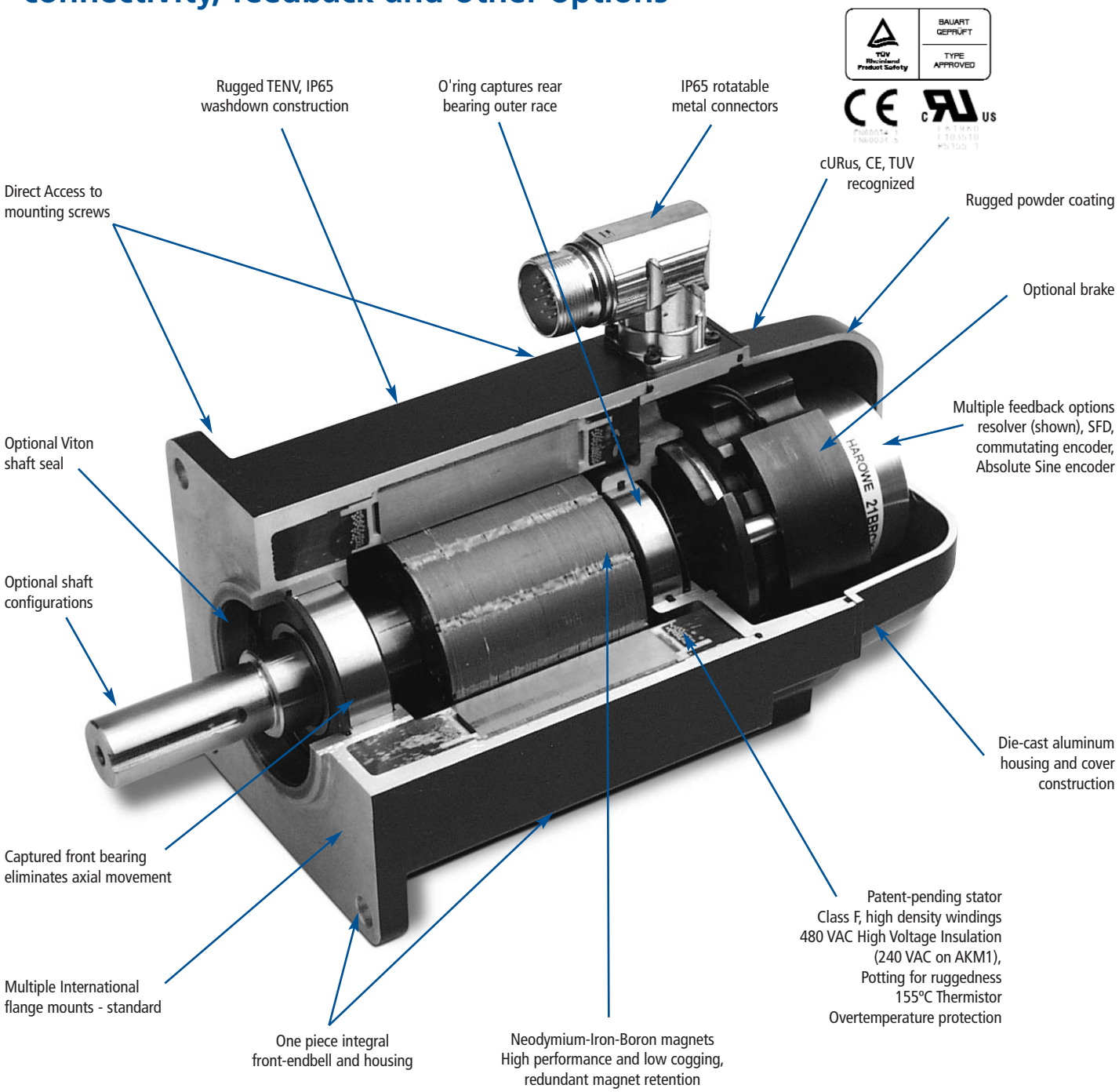
Recommended Motor/Drive Systems, 480 VAC, 640VDC ①

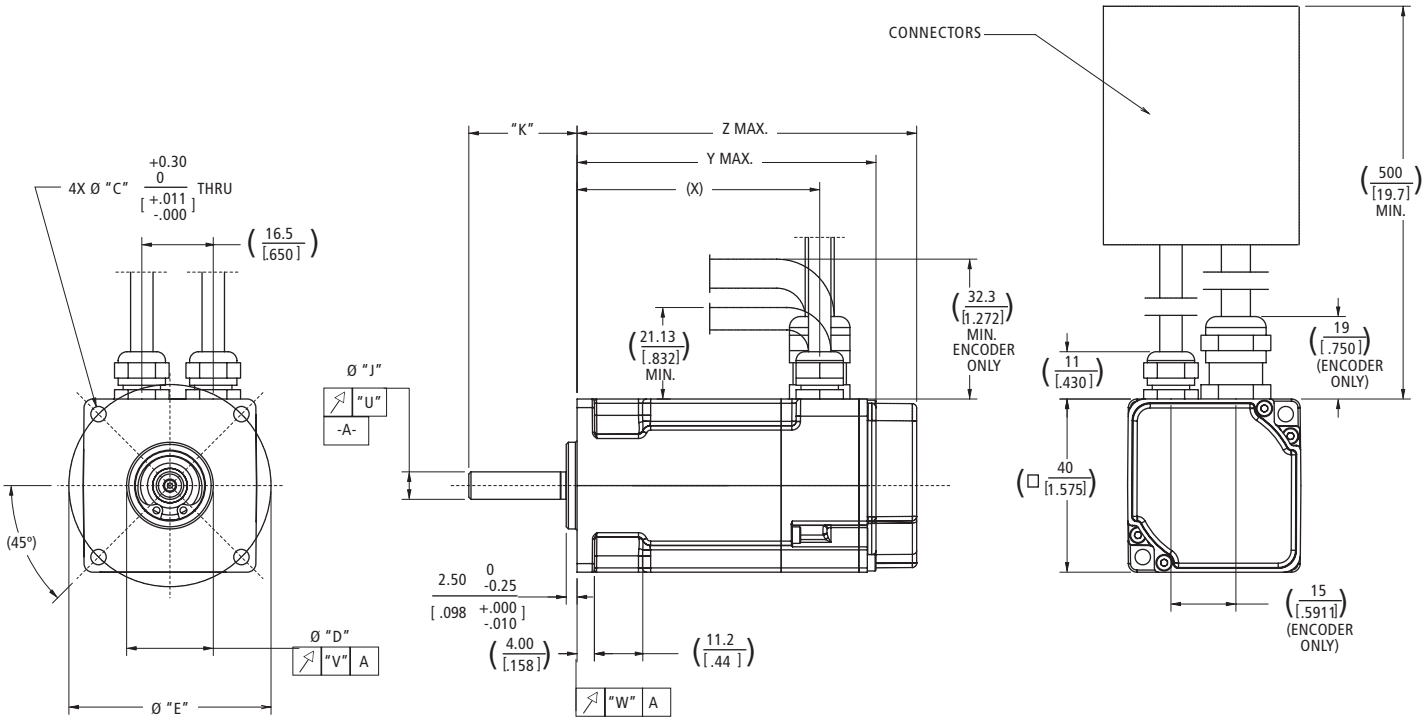
Servo Motor Model	Servo Drive Model	Peak Stall Torque T_{ps} ② N-m (lb-in)	Peak Torque at at Max. Speed T_{ms} N-m (lb-in)	Cont. Stall Torque T_{cs} N-m (lb-in)	Cont. Rated Torque T_{cr} N-m (lb-in)	Speed at Knee ω_k rpm	Rated Speed ω_r rpm	wmax. Speed ω_{max} rpm	Cont. Stall Current I_{cs} A rms	Current@Peak Torque I_{ps} A rms	Inertia ③ J kg-cm^2 (lb-in-s^2 x 10^{-3})
AKM23D	S60300	2.87 (25.4)	2.87 (25.4)	1.16 (10.2)	0.92 (8.11)	8,000	8,000	8,000	2.19	6.0	0.216 (0.191)
AKM24D	S60300	3.52 (31.2)	3.52 (31.2)	1.41 (12.4)	1.11 (9.81)	8,000	8,000	8,000	2.21	6.0	0.27 (0.239)
AKM32D	S60300	5.14 (45.5)	0.0 (0.0)	2.04 (18.0)	1.58 (14)	5,500	6,000	7,510	2.23	6.0	0.59 (0.522)
AKM33E	S60300	6.35 (56.2)	0.0 (0.0)	2.79 (24.7)	2.27 (20.1)	5,050	5,000	6,280	2.58	6.0	0.85 (0.752)
AKM41E	S60300	3.87 (34.2)	3.87 (34.2)	2.02 (17.8)	1.58 (14.0)	6,000	6,000	6,000	2.85	6.0	0.81 (0.717)
AKM42E	S60300	6.97 (61.7)	0.0 (0.0)	3.42 (30.3)	2.72 (24.1)	3,850	4,000	5,480	2.74	6.0	1.45 (1.28)
AKM42G	S60600	7.99 (70.7)	7.99 (70.7)	3.53 (31.2)	2.35 (20.8)	6,000	6,000	6,000	4.8	12.0	1.45 (1.28)
AKM43E	S60300	9.67 (85.6)	0.0 (0.0)	4.7 (41.6)	3.76 (33.3)	2,910	3,000	4,000	2.76	6.0	2.09 (1.85)
AKM43G	S60600	10.9 (96.8)	6.7 (59.3)	4.8 (42.5)	2.57 (22.7)	4,950	6,000	6,000	4.87	12.0	2.09 (1.85)
AKM44E	S60300	11.6 (103)	0.0 (0.0)	5.76 (51)	4.56 (40.4)	2,570	2,500	3,370	2.85	6.0	2.73 (2.42)
AKM44G	S60600	13.3 (118)	0.0 (0.0)	5.88 (52.0)	3.19 (28.2)	4,350	5,000	5,790	5.0	12.0	2.73 (2.42)
AKM44J	S610-3000	18.1 (160)	18.1 (160)	6.0 (53.1)	2.75 (24.3)	6,000	6,000	6,000	8.8	30.0	2.73 (2.42)
AKM51E	S60300	9.14 (80.9)	0.0 (0.0)	4.7 (41.6)	3.8 (33.7)	2,770	3,000	4,010	2.75	6.0	3.42 (3.03)
AKM51G	S60600	10.2 (90.4)	5.9 (52.2)	4.75 (42.1)	1.94 (17.2)	4,680	6,000	6,000	4.84	12.0	3.42 (3.03)
AKM52E	S60300	15.4 (136)	0.0 (0.0)	8.34 (73.8)	7.28 (64.4)	1,890	2,000	2,470	3.0	6.0	6.22 (5.51)
AKM52G	S60600	18.9 (168)	0.0 (0.0)	8.43 (74.6)	6.66 (59)	2,750	3,000	3,840	4.72	12.0	6.22 (5.51)
AKM52K	S61000	16.9 (150)	15.8 (140)	8.6 (76.1)	3.25 (28.8)	5,890	6,000	6,000	9.3	20.0	6.22 (5.51)
AKM52K	S610-3000	21.9 (194)	15.7 (139)	8.6 (76.1)	3.25 (28.8)	4,990	6,000	6,000	9.3	27.8	6.22 (5.51)
AKM53G	S60600	25.8 (229)	0.0 (0.0)	11.4 (101)	9.5 (84)	2,160	2,400	2,880	4.77	12.0	9.12 (8.07)
AKM53K	S61000	22.9 (203)	0.0 (0.0)	11.6 (103)	6.85 (60.6)	4,650	4,500	5,550	9.4	20.0	9.12 (8.07)
AKM53K	S610-3000	30.2 (267)	0.0 (0.0)	11.6 (103)	6.85 (60.6)	4,014	4,500	5,550	9.4	28.1	9.12 (8.07)
AKM54G	S60600	31.7 (280)	0.0 (0.0)	14.3 (126)	12.3 (109)	1,860	2,000	2,390	5.0	12.0	11.9 (10.6)
AKM54K	S61000	28.1 (249)	0.0 (0.0)	14.4 (127)	9.25 (81.9)	3,960	4,000	4,590	9.7	20.0	11.9 (10.6)
AKM54K	S610-3000	38.4 (340)	0.0 (0.0)	14.4 (127)	9.25 (81.9)	3,410	4,000	4,590	9.7	29.2	11.9 (10.6)
AKM62G	S60600	25.6 (227)	0.0 (0.0)	11.9 (106)	10.2 (90.1)	1,780	2,000	2,790	4.85	12.0	16.9 (15)
AKM62K	S61000	22.7 (201)	0.0 (0.0)	12.2 (108)	8.02 (71)	3,900	4,500	5,400	9.6	20.0	16.9 (15)
AKM62K	S610-3000	30.1 (267)	0.0 (0.0)	12.2 (108)	8.02 (71)	3,130	4,500	5,400	9.6	28.7	16.9 (15)
AKM62M	S61400	22.8 (201)	18.8 (166)	12.2 (108)	5.74 (50.8)	5,480	6,000	6,000	13.4	28.0	16.9 (15)
AKM63G	S60600	38.4 (340)	0.0 (0.0)	16.5 (146)	14.6 (128)	1,200	1,500	1,860	4.48	12.0	24.2 (21.4)
AKM63K	S61000	31 (274)	0.0 (0.0)	16.8 (149)	12 (106)	3,170	3,500	4,030	9.9	20.0	24.2 (21.4)
AKM63K	S610-3000	42.6 (377)	0.0 (0.0)	16.8 (149)	12 (106)	2,580	3,500	4,030	9.9	29.7	24.2 (21.4)
AKM63M	S61400	31.4 (278)	0.0 (0.0)	17 (150)	10.5 (92.9)	4,400	4,500	5,550	13.8	28.0	24.2 (21.4)
AKM63N	S62000	34.8 (308)	24.6 (218)	17 (150)	7.0 (62)	5,260	6,000	6,000	17.4	40.0	24.2 (21.4)
AKM64K	S61000	41.2 (365)	0.0 (0.0)	20.8 (184)	16.3 (145)	2,400	2,500	3,030	9.2	20.0	31.6 (28)
AKM64K	S610-3000	53.5 (474)	0.0 (0.0)	20.8 (184)	16.3 (145)	2,050	2,500	3,030	9.2	27.5	31.6 (28)
AKM64L	S61400	41.9 (371)	0.0 (0.0)	21 (186)	14.4 (127)	3,340	3,500	4,160	12.8	28.0	31.6 (28)
AKM64P	S62000	40.2 (355)	15.6 (138)	20.4 (180)	9.02 (79.8)	5,130	5,500	6,000	18.6	40.0	31.6 (28)
AKM65K	S61000	46.8 (414)	0.0 (0.0)	24.8 (219)	19.7 (175)	2,260	2,200	2,710	9.8	20.0	40.0 (35.4)
AKM65K	S610-3000	64.5 (571)	0.0 (0.0)	24.8 (219)	19.7 (175)	1,900	2,200	2,710	9.8	29.4	40.0 (35.4)
AKM65M	S61400	47.6 (421)	0.0 (0.0)	25 (221)	18.1 (160)	3,120	3,000	3,720	13.6	28.0	40.0 (35.4)
AKM65N	S62000	50.2 (444)	0.0 (0.0)	24.3 (215)	14.7 (131)	4,120	4,000	5,000	17.8	40.0	40.0 (35.4)
AKM72K	S61000	59.4 (526)	0.0 (0.0)	29.7 (263)	24 (213)	1,560	1,800	2,130	9.3	20.0	64.5 (57.1)
AKM72K	S610-3000	79.2 (701)	0.0 (0.0)	29.7 (263)	24 (213)	1,280	1,800	2,130	9.3	27.8	64.5 (57.1)
AKM72M	S61400	59.8 (529)	0.0 (0.0)	30 (266)	22.1 (196)	2,180	2,500	2,960	13	28.0	64.5 (57.1)
AKM72P	S62000	58.4 (516)	0.0 (0.0)	29.4 (260)	18.2 (161)	3,280	3,500	4,350	18.7	40.0	64.5 (57.1)
AKM73M	S61400	80.7 (714)	0.0 (0.0)	42 (372)	32.1 (284)	1,740	1,800	2,220	13.6	28.0	94.1 (81.5)
AKM73P	S62000	79.4 (702)	0.0 (0.0)	41.6 (368)	26.3 (233)	2,570	2,800	3,230	19.5	40.0	94.1 (81.5)
AKM74L	S61400	108 (952)	0.0 (0.0)	53 (469)	41.5 (367)	1,300	1,400	1,660	12.9	28.0	120.0 (106)
AKM74P	S62000	106 (936)	0.0 (0.0)	52.5 (464)	35.9 (318)	1,930	2,000	2,420	18.5	40.0	120.0 (106)

① See definitions of ratings beginning on page 8.
② Peak torque ratings are for 5 seconds.
③ Includes resolver feedback inertia.

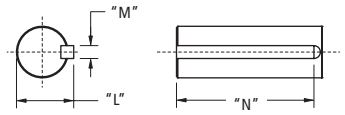


The AKM series of motors offers a wide range of options for mounting, connectivity, feedback and other options





MOUNTING CODE	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"	"M"	"N"
AK	4.30 [.169]	30 0 -0.021 [1.1811 +.0000 -.0008] h7	46 [1.811]	–	–	8 0 -0.015 [.3150 +.0000 -.0006] h7	25.0 [.984]	9.20 0 -0.13 [.362 +.000 -.005]	3 0 -0.025 [.1811 +.0000 -.0010]	14 0 -0.2 [.551 +.000 -.008]
AN	4.30 [.169]	30 0 -0.021 [1.1811 +.0000 -.0008] h7	46 [1.811]	–	–	8 0 -0.015 [.3150 +.0000 -.0006] h7	25 [.984]	–	–	–
BN	3.56 [.140]	20.02 ± 0.02 [.788 ± .001]	46.69 [1.838]	–	–	6.350 0 -0.012 [.2500 +.0000 -.0005]	25 [.984]	–	–	–
CK	3.40 [.134]	30 0 -0.021 [1.1811 +.0000 -.0008] h7	45 [1.772]	–	–	8 0 -0.015 [.3150 +.0000 -.0006] h7	25 [.984]	9.20 0 -0.13 [.362 +.000 -.005]	3 0 -0.025 [.1811 +.0000 -.0010]	14 0 -0.2 [.551 +.000 -.008]
CN	3.40 [.134]	30 0 -0.021 [1.1811 +.0000 -.0008] h7	45 [1.772]	–	–	8 0 -0.015 [.3150 +.0000 -.0006] h7	25 [.984]	–	–	–



(X)	Y MAX. (W/ RESOLVER)	Z MAX. (W/ SFD OR ENCODER)	MODEL
56.1 [2.21]	69.6 [2.74]	79.0 [3.11]	AKM11
75.1 [2.96]	88.6 [3.49]	98.0 [3.86]	AKM12
94.1 [3.70]	107.6 [4.24]	117.0 [4.61]	AKM13

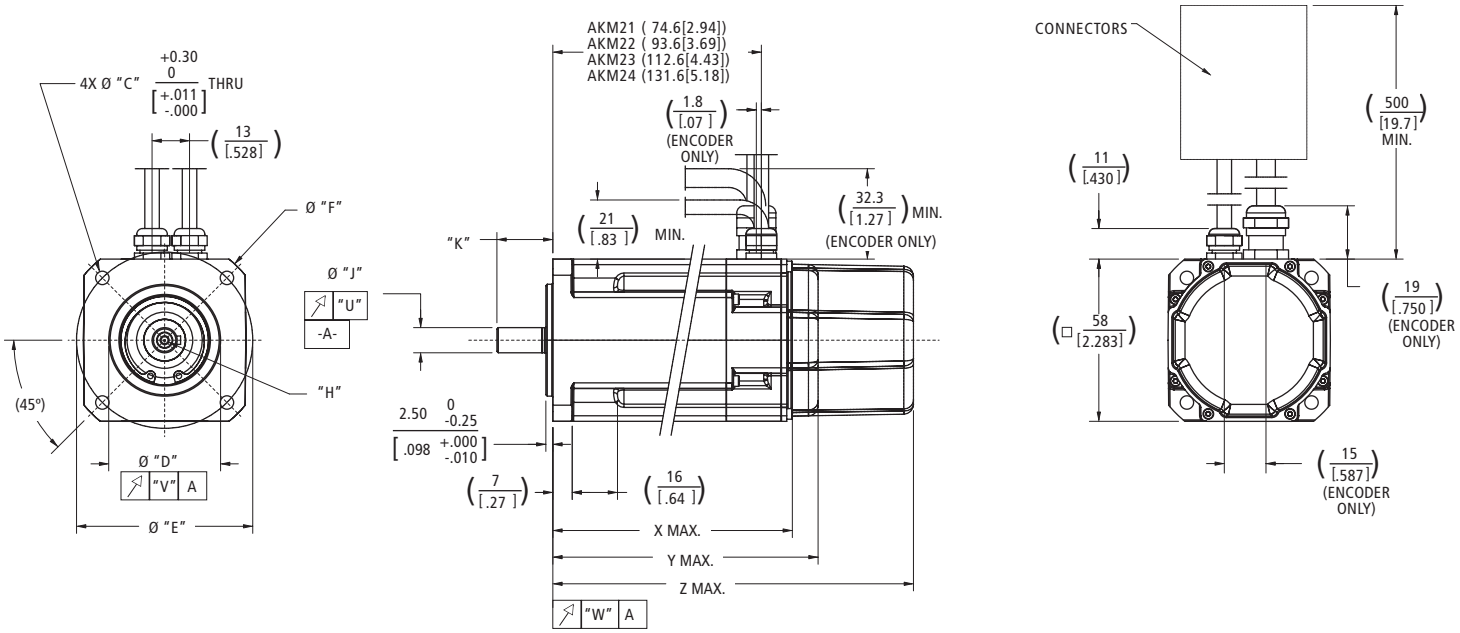
Dimensions are in mm [inches].
Product designed in metric.
English conversions provided for reference only.

AKM1x - Up to 320 VDC

See system data beginning on page 8 for typical torque/speed performance.

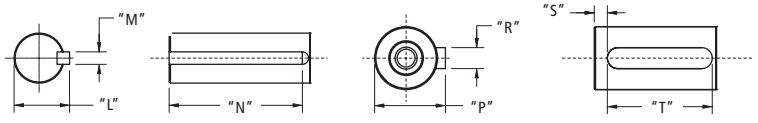
					AKM11			AKM12		AKM13	
	Parameter	Tol	Symbol	Units	B	C	E	C	E	C	D
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	320	160	75	320	160	320	160
	Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧	Nom	T_{cs}	N-m	0.183	0.185	0.185	0.310	0.310	0.409	0.401
				lb-in	1.62	1.64	1.64	2.74	2.74	3.62	3.55
	Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧	Nom	I_{cs}	A_{rms}	1.16	1.45	2.91	1.51	2.72	1.48	2.40
	Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T_{cs}	N-m	0.146	0.148	0.148	0.248	0.248	0.327	0.320
				lb-in	1.29	1.31	1.31	2.19	2.19	2.89	2.83
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	8000	8000	8000	8000	8000	8000	8000
	Peak Torque ①②	Nom	T_p	N-m	0.609	0.614	0.611	1.08	1.08	1.46	1.44
				lb-in	5.39	5.43	5.41	9.6	9.6	12.9	12.7
	Peak Current	Nom	I_p	A_{rms}	4.65	5.79	11.6	6.06	10.9	5.93	9.6
75VDC	Rated Torque (speed) ①②⑦⑧⑨		T_{rtd}	N-m	-	-	0.176	-	0.309	-	0.401
				lb-in	-	-	1.56	-	2.73	-	3.55
	Rated Speed		N_{rtd}	rpm	-	-	6000	-	3000	-	2000
	Rated Power (speed) ①②⑦⑧		P_{rtd}	kW	-	-	0.11	-	0.10	-	0.08
				Hp	-	-	0.15	-	0.13	-	0.11
160VDC	Rated Torque (speed) ①②⑦⑧⑨		T_{rtd}	N-m	0.180	0.176	-	0.304	0.279	0.407	0.365
				lb-in	1.59	1.56	-	2.69	2.47	3.60	3.23
	Rated Speed		N_{rtd}	rpm	4000	6000	-	4000	8000	3000	7000
	Rated Power (speed) ①②⑦⑧		P_{rtd}	kW	0.08	0.11	-	0.13	0.23	0.13	0.27
				Hp	0.10	0.15	-	0.17	0.31	0.17	0.36
320VDC	Rated Torque (speed) ①②⑦⑧⑨		T_{rtd}	N-m	0.167	-	-	0.279	-	0.364	-
				lb-in	1.48	-	-	2.47	-	3.22	-
	Rated Speed		N_{rtd}	rpm	8000	-	-	8000	-	8000	-
	Rated Power (speed) ①②⑦⑧		P_{rtd}	kW	0.14	-	-	0.23	-	0.30	-
				Hp	0.19	-	-	0.31	-	0.41	-
560VDC	Rated Torque (speed) ①②⑦⑧⑨		T_{rtd}	N-m	x	x	x	x	x	x	x
				lb-in	x	x	x	x	x	x	x
	Rated Speed		N_{rtd}	rpm	x	x	x	x	x	x	x
	Rated Power (speed) ①②⑦⑧		P_{rtd}	kW	x	x	x	x	x	x	x
				Hp	x	x	x	x	x	x	x
640VDC	Rated Torque (speed) ①②⑦⑧		T_{rtd}	N-m	x	x	x	x	x	x	x
				lb-in	x	x	x	x	x	x	x
	Rated Speed		N_{rtd}	rpm	x	x	x	x	x	x	x
	Rated Power (speed) ①②⑦⑧		P_{rtd}	kW	x	x	x	x	x	x	x
				Hp	x	x	x	x	x	x	x
	Torque Constant ①	±10%	K_t	N-m/A_{rms}	0.158	0.129	0.064	0.207	0.112	0.278	0.169
				lb-in/A_{rms}	1.40	1.14	0.57	1.83	0.99	2.46	1.50
	Back EMF constant ⑥	±10%	K_e	V/k_{rpm}	10.2	8.3	4.1	13.3	7.2	17.9	10.9
	Resistance (line-line) ⑥	±10%	R_m		19.3	13.1	3.0	12.4	3.9	13.5	5.21
	Inductance (line-line)		L	mH	12.5	8.3	2.04	9.1	2.7	10.3	3.8
	Inertia (includes Resolver feedback) ③		J_m	kg-cm^2	0.017			0.031		0.045	
				lb-in-s^2	1.5E-05			2.7E-05		4.0E-05	
	Optional Brake Inertia (additional)		J_m	kg-cm^2	x			x		x	
				lb-in-s^2	x			x		x	
	Weight		W	kg	0.35			0.49		0.63	
				lb	0.8			1.1		1.4	
	Static Friction ①⑨		T_f	N-m	0.0011			0.0021		0.0031	
				lb-in	0.01			0.02		0.03	
	Viscous Damping ①		K_{dv}	N-m/k_{rpm}	0.0005			0.001		0.0015	
				lb-in/k_{rpm}	0.004			0.009		0.013	
	Thermal Time Constant		TCT	minutes	4			6		7	
	Thermal Resistance		R_{thw-a}	°C/W	1.75			1.69		1.62	
	Pole Pairs				3			3		3	
	Heatsink Size				10"x10"x1/4" Alum. Plate			10"x10"x1/4" Alum. Plate		10"x10"x1/4" Alum. Plate	

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. No brake motor option on AKM1.
8. Commutating encoder/SFD option : no continuous torque reduction.
9. For motors with optional shaft seal, reduce torque shown by 0.021 N-m (0.19lb-in), and increase T_f by the same amount.



MOUNTING CODE	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"	"M"	"N"
AC	4.80 [.189]	40 +0.011 -0.005 [1.5748 +.0004 -.0002] j6	63 [2.480]	74 [2.913]	D M3 DIN 332	9 +0.010 +0.001 [.3543 +.0004 +.0000] k6	20.0 [.79]	–	–	–
AN	4.80 [.189]	40 +0.011 -0.005 [1.5748 +.0004 -.0002] j6	63 [2.480]	74 [2.913]	D M3 DIN 332	9 +0.010 +0.001 [.3543 +.0004 +.0000] k6	20.0 [.79]	–	–	–
BN	5.10 [.201]	38.10 0 -0.05 [1.500 +.000 -.002]	66.68 [2.625]	–	–	9.525 +0 -0.013 [.3750 +.0000 -.0005]	31.75 ± 0.79 [1.250 ± .031]	–	–	–
CK	5.80 [.228]	50 0 -0.016 [1.9685 +.0000 -.0006] h6	70 [2.756]	–	–	14 +0 -0.011 [.5512 +.0000 -.0004] h6	30.0 [1.181]	16 0 -0.13 [.630 +.000 -.005]	5 0 -0.03 [.197 +.009 -.001] N9	20 0 -0.02 [.787 +.000 -.008]
DC	5.80 [.228]	40 +0.011 -0.005 [1.5748 +.0004 -.0002] j6	65 [2.559]	–	D M3 DIN 332	9 +0.010 +0.001 [.3543 +.0004 +.0000] k6	20.0 [.79]	–	–	–
DN	5.80 [.228]	40 +0.011 -0.005 [1.5748 +.0004 -.0002] j6	65 [2.559]	–	D M3 DIN 332	9 +0.010 +0.001 [.3543 +.0004 +.0000] k6	20.0 [.79]	–	–	–
EN	5.10 [.201]	38.10 0 -0.05 [1.500 +.000 -.002]	66.68 [2.625]	–	–	9.525 +0 -0.013 [.3750 +.0000 -.0005]	20.57 ± 0.25 [0.810 ± 0.010]	–	–	–

MOUNTING CODE	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	10.2 0 -0.13 [.402 +.000 -.005]	3 0 -0.025 [.1181 +.0000 -.0010]	3.00 [.118]	12 0 -0.20 [.472 +.000 -.008]	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
AN	–	–	–	–	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
BN	–	–	–	–	0.051 [.0020]	0.10 [.004]	0.10 [.004]
CK	–	–	–	–	0.035 [0.0013]	0.080 [0.0031]	0.080 [.0031]
DC	10.2 0 -0.13 [.402 +.000 -.005]	3 0 -0.025 [.1181 +.0000 -.0010]	3.00 [.118]	12 0 -0.20 [.472 +.000 -.008]	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
DN	–	–	–	–	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
EN	–	–	–	–	0.051 [.0020]	0.10 [.004]	0.10 [.004]



X MAX. (W/ RESOLVER)	Y MAX. (W/ SFD OR ENCODER)	Z MAX. (W/ BRAKE)	MODEL
86.2 [3.39]	95.4 [3.76]	129.5 [5.10]	AKM21
105.2 [4.14]	114.4 [4.50]	148.5 [5.85]	AKM22
124.2 [4.89]	133.4 [5.25]	167.5 [6.59]	AKM23
143.2 [5.64]	152.4 [6.00]	186.5 [7.34]	AKM24

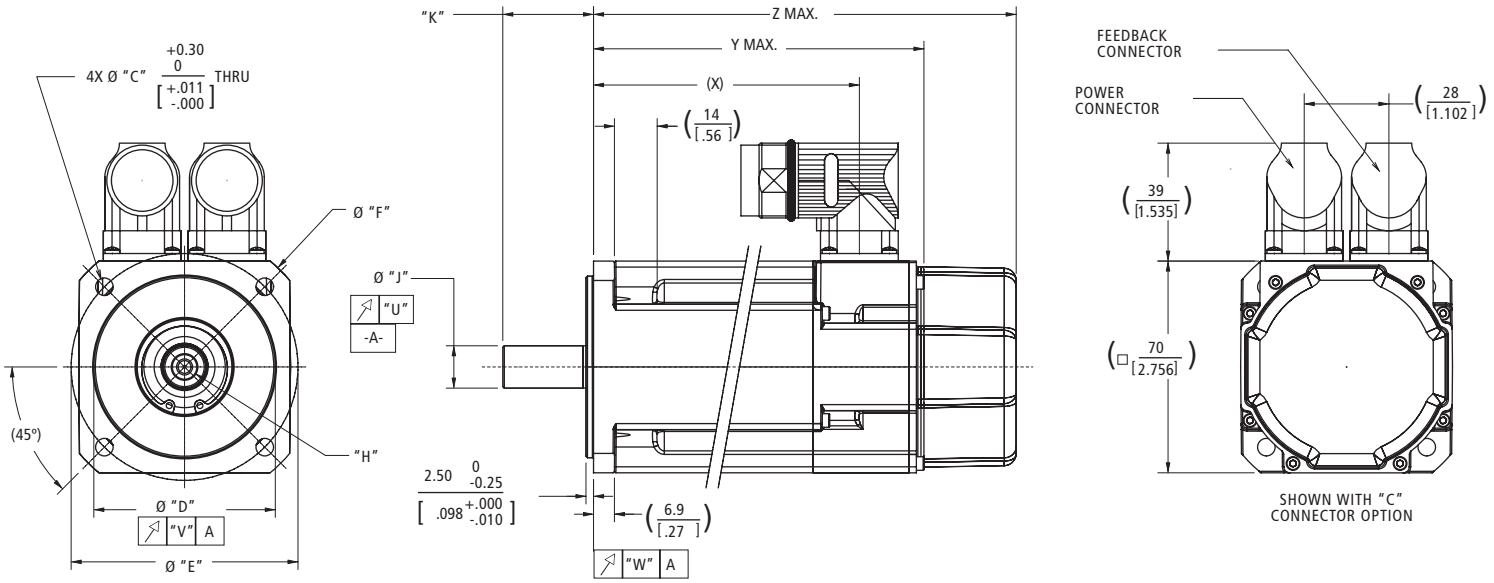
Dimensions are in mm [inches].
Product designed in metric.
English conversions provided for reference only.

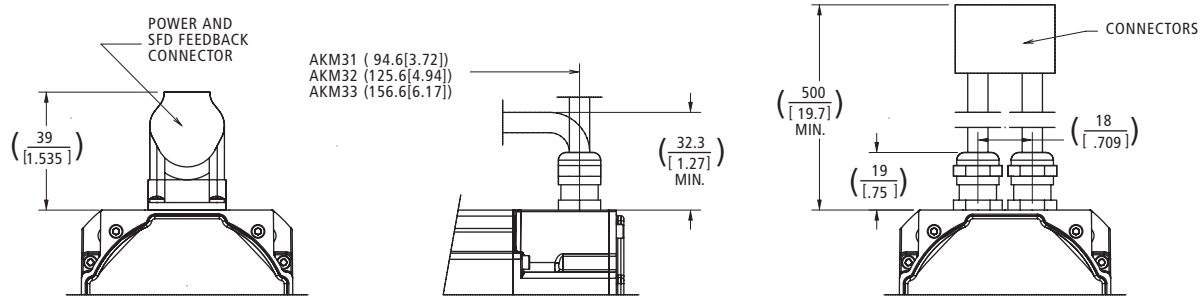
AKM2x - Up to 640 VDC

See system data beginning on page 8 for typical torque/speed performance.

					AKM21			AKM22			AKM23			AKM24		
	PARAMETER	Tol	SYMBOL	UNITS	C	E	G	C	E	G	C	D	F	C	D	F
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	320	160	75	640	320	160	640	640	320	640	640	320
	Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T_{cs}	N-m	0.48	0.50	0.50	0.84	0.87	0.88	1.13	1.16	1.18	1.38	1.41	1.42
				lb-in	4.2	4.4	4.4	7.4	7.7	7.8	10.0	10.3	10.4	12.2	12.5	12.6
	Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	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
	Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T_{cs}	N-m	0.38	0.40	0.40	0.67	0.70	0.70	0.90	0.92	0.94	1.10	1.13	1.14
				lb-in	3.4	3.5	3.5	5.9	6.2	6.2	8.0	8.2	8.4	9.8	10.0	10.1
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
	Peak Torque ①②	Nom	T_p	N-m	1.47	1.49	1.51	2.73	2.76	2.79	3.77	3.84	3.88	4.73	4.76	4.82
				lb-in	13.0	13.2	13.4	24.2	24.4	24.7	33.4	34.0	34.3	41.9	42.1	42.7
	Peak Current	Nom	I_p	A_{rms}	6.3	12.4	19.5	5.6	10.9	19.3	5.6	8.8	17.2	5.7	8.8	15.6
75VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	0.48	0.46	-	0.85	0.83	-	-	1.15	-	-	1.39
				lb-in	-	4.2	4.1	-	7.5	7.4	-	-	10.2	-	-	12.3
	Rated Speed		N_{rtd}	rpm	-	2000	4000	-	1000	2500	-	-	1500	-	-	1000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	0.10	0.19	-	0.09	0.22	-	-	0.18	-	-	0.15
				Hp	-	0.13	0.26	-	0.12	0.29	-	-	0.24	-	-	0.20
160VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	0.46	0.41	-	0.83	0.81	0.74	1.11	1.12	1.07	-	1.36	1.33
				lb-in	4.0	3.7	-	7.3	7.1	6.5	9.8	9.9	9.5	-	12.0	11.8
	Rated Speed		N_{rtd}	rpm	2500	7000	-	1000	3500	7000	1000	1500	4500	-	1500	3000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.12	0.30	-	0.09	0.30	0.54	0.12	0.18	0.50	-	0.21	0.42
				Hp	0.16	0.41	-	0.12	0.40	0.72	0.16	0.24	0.68	-	0.29	0.56
320VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	0.39	-	-	0.78	.70	-	1.08	1.03	0.94	1.32	1.29	1.12
				lb-in	3.4	-	-	6.9	6.2	-	9.6	9.1	8.3	11.7	11.4	9.9
	Rated Speed		N_{rtd}	rpm	8000	-	-	3500	8000	-	2500	5000	8000	2000	4000	8000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.32	-	-	0.29	0.59	-	0.28	0.54	0.79	0.28	0.54	0.94
				Hp	0.43	-	-	0.38	0.79	-	0.38	0.72	1.06	0.37	0.72	1.26
560VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	-	0.68	-	-	0.99	0.92	-	1.25	1.11	-
				lb-in	-	-	-	6.0	-	-	8.8	8.1	-	11.1	9.8	-
	Rated Speed		N_{rtd}	rpm	-	-	-	8000	-	-	5500	8000	-	4500	8000	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	0.57	-	-	0.57	0.77	-	0.59	0.93	-
				Hp	-	-	-	0.76	-	-	0.76	1.03	-	0.79	1.25	-
640VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	-	0.68	-	-	0.95	0.92	-	1.22	1.11	-
				lb-in	-	-	-	6.0	-	-	8.4	8.1	-	10.8	9.8	-
	Rated Speed		N_{rtd}	rpm	-	-	-	8000	-	-	7000	8000	-	5500	8000	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	0.57	-	-	0.70	0.77	-	0.70	0.93	-
				Hp	-	-	-	0.76	-	-	0.93	1.03	-	0.94	1.25	-
	Torque Constant ①	±10%	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
	Back EMF constant ⑥	±10%	K_e	V/k_{rpm}	19.5	10.2	6.6	39	20.4	11.7	51.8	33.8	17.6	62.4	40.8	23.4
	Resistance (line-line) ⑥	±10%	R_m		13.0	3.42	1.44	19.4	5.09	1.77	20.3	8.36	2.23	20.4	8.4	2.94
	Inductance (line-line)		L	mH	19	5.2	2.18	35.5	9.7	3.19	40.7	17.3	4.68	43.8	18.7	6.16
	Inertia (includes Resolver feedback) ③		J_m	kgcm^2	0.11			0.16			0.22			0.27		
				lb-in-s^2	9.5E-05			1.4E-04			1.9E-04			2.4E-04		
	Optional Brake Inertia (additional)		J_m	kg-cm^2	0.012			0.012			0.012			0.012		
				lb-in-s^2	1.1E-05			1.1E-05			1.1E-05			1.1E-05		
	Weight		W	kg	0.82			1.1			1.38			1.66		
				lb	1.8			2.4			3.0			3.7		
	Static Friction ①⑩		T_f	N-m	0.002			0.005			0.007			0.01		
				lb-in	0.02			0.04			0.06			0.09		
	Viscous Damping ①		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		
	Thermal Time Constant		TCT	minutes	8			9			10			11		
	Thermal Resistance		R_{thw-a}	°C/W	1.48			1.28			1.19			1.17		
	Pole Pairs				3			3			3			3		
	Heatsink Size				10″x10″x1/4″ Aluminum Plate			10″x10″x1/4″ Aluminum Plate			10″x10″x1/4″ Aluminum Plate			10″x10″x1/4″ Aluminum Plate		

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by:
   AKM21 = 0.00 AKM22 = 0.01 N-m
   AKM23 = 0.02 N-m AKM24 = 0.05 N-m
8. Commutating encoder/SFD option: no continuous torque reduction.
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM21 = 0.00 AKM22 = 0.02 N-m
   AKM23 = 0.05 N-m AKM24 = 0.12 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.047 N-m (0.41lb-in), and increase T_f by the same amount.

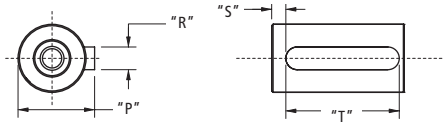




MOUNTING CODE	"C"	"D"	"E"	"F"	"H"	"J"	"K"
AC	5.80 [.228]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	75 [2.953]	90 [3.543]	D M5 DIN 332	14 +0.012 +0.001 [.5512 +.0005 +.0000] k6	30.0 [1.181]
AN	5.80 [.228]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	75 [2.953]	90 [3.543]	D M5 DIN 332	14 +0.012 +0.001 [.5512 +.0005 +.0000] k6	30.0 [1.181]
CC	5.80 [.228]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	85 [3.346]	–	D M5 DIN 332	14 +0.012 +0.001 [.5512 +.0005 +.0000] k6	30.0 [1.181]
CN	5.80 [.228]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	85 [3.346]	–	D M5 DIN 332	14 +0.012 +0.001 [.5512 +.0005 +.0000] k6	30.0 [1.181]

MOUNTING CODE	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	16 0 -0.13 [.630 +.000 -.005]	5 0 -0.03 [.197 +.000 -.001] N9	5.00 [1.97]	20 0 -0.20 [.787 +.000 -.008]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
AN	–	–	–	–	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CC	16 0 -0.13 [.630 +.000 -.005]	5 0 -0.03 [.197 +.000 -.001] N9	5.00 [1.97]	20 0 -0.20 [.787 +.000 -.008]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CN	–	–	–	–	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]

(X)	Y MAX.	Z MAX. (W/ BRAKE)	MODEL
87.9 [3.46]	109.8 [4.32]	140.3 [5.52]	AKM31
118.9 [4.68]	140.8 [5.54]	171.3 [6.74]	AKM32
149.9 [5.90]	171.8 [6.76]	202.3 [7.97]	AKM33



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

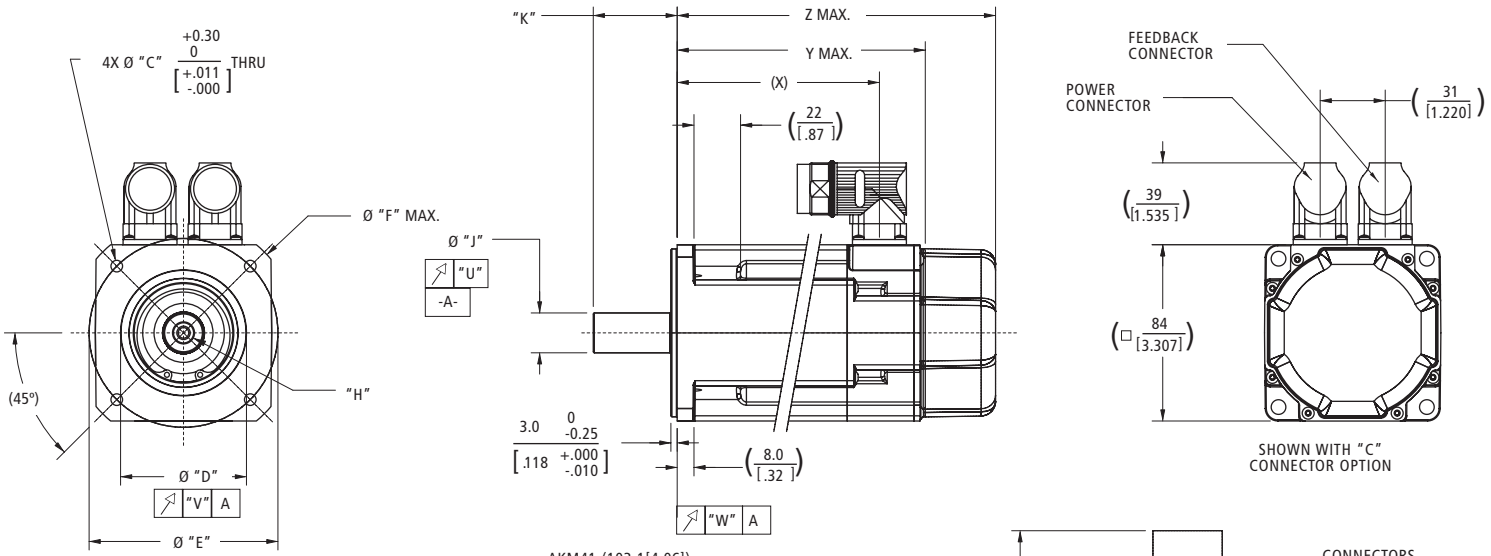
AKM3x - Up to 640 VDC

See system data beginning on page 8 for typical torque/speed performance.

	PARAMETER	Tol	SYMBOL	UNITS	AKM31 C	AKM31 E	AKM31 H	AKM32 C	AKM32 D	AKM32 H	AKM33 C	AKM33 E	AKM33 H
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	320	160	640	640	320	640	640	320
	Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T_{cs}	N-m	1.15	1.20	1.23	2.00	2.04	2.10	2.71	2.79	2.88
				lb-in	10.2	10.6	10.8	17.7	18.1	18.6	24.0	24.7	25.5
	Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	I_{cs}	A_{rms}	1.37	2.99	5.85	1.44	2.23	5.50	1.47	2.58	5.62
	Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T_{cs}	N-m	0.92	0.96	0.98	1.60	1.63	1.68	2.17	2.23	2.30
				lb-in	8.1	8.5	8.7	14.2	14.4	14.9	19.2	19.7	20.4
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000
	Peak Torque ①②	Nom	T_p	N-m	3.88	4.00	4.06	6.92	7.05	7.26	9.76	9.96	10.22
				lb-in	34.3	35.4	35.9	61.2	62.4	64.3	86.4	88.1	90.5
	Peak Current	Nom	I_p	A_{rms}	5.5	12.0	23.4	5.7	8.9	22.0	5.9	10.3	22.5
75VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	1.19	1.20	-	-	2.06	-	-	2.82
				lb-in	-	10.5	10.6	-	-	18.2	-	-	24.6
	Rated Speed		N_{rtd}	rpm	-	750	2000	-	-	1200	-	-	800
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	0.09	0.25	-	-	0.26	-	-	0.24
				Hp	-	0.13	0.34	-	-	0.35	-	-	0.32
160VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	1.17	0.97	-	2.00	1.96	-	-	2.66
				lb-in	-	10.3	8.6	-	17.7	17.4	-	-	23.5
	Rated Speed		N_{rtd}	rpm	-	2500	6000	-	1000	3000	-	-	2500
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	0.31	0.61	-	0.21	0.62	-	-	0.70
				Hp	-	0.41	0.82	-	0.28	0.83	-	-	0.93
320VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	1.12	0.95	-	1.95	1.93	1.45	2.64	2.62	2.27
				lb-in	9.9	8.4	-	17.3	17.1	12.8	23.4	23.2	20.1
	Rated Speed		N_{rtd}	rpm	2500	6000	-	1500	2500	7000	1000	2000	5500
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.29	0.60	-	0.31	0.51	1.06	0.28	0.55	1.31
				Hp	0.39	0.80	-	0.41	0.68	1.42	0.37	0.74	1.75
560VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	1.00	-	-	1.86	1.65	-	2.54	2.34	-
				lb-in	8.9	-	-	16.5	14.6	-	22.5	20.7	-
	Rated Speed		N_{rtd}	rpm	5000	-	-	3000	5500	-	2000	4500	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.52	-	-	0.58	0.95	-	0.53	1.10	-
				Hp	0.70	-	-	0.78	1.27	-	0.71	1.48	-
640VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	0.91	-	-	1.83	1.58	-	2.50	2.27	-
				lb-in	8.1	-	-	16.2	14.0	-	22.1	20.1	-
	Rated Speed		N_{rtd}	rpm	6000	-	-	3500	6000	-	2500	5000	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.57	-	-	0.67	0.99	-	0.65	1.19	-
				Hp	0.77	-	-	0.90	1.33	-	0.88	1.59	-
	Torque Constant ①	±10%	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
	Back EMF constant ⑥	±10%	K_e	V/k_{rpm}	54.5	26.1	13.7	89.8	59.0	24.8	120	70.6	33.4
	Resistance (line-line) ⑥	±10%	R_m		21.4	4.58	1.25	23.0	9.57	1.64	25.4	8.36	1.82
	Inductance (line-line)		L	mH	37.5	8.6	2.4	46.5	20.1	3.55	53.6	18.5	4.1
	Inertia (includes Resolver feedback) ③		J_m	kg-cm^2	0.33			0.59			0.85		
				lb-in-s^2	2.9E-04			5.2E-04			7.5E-04		
	Optional Brake Inertia (additional)		J_m	kg-cm^2	0.012			0.012			0.012		
				lb-in-s^2	1.1E-05			1.1E-05			1.1E-05		
	Weight		W	kg	1.55			2.23			2.9		
				lb	3.4			4.9			6.4		
	Static Friction ①⑩		T_f	N-m	0.014			0.02			0.026		
				lb-in	0.12			0.18			0.23		
	Viscous Damping ①		K_{dv}	N-m/k_{rpm}	0.002			0.003			0.004		
				lb-in/k_{rpm}	0.02			0.03			0.04		
	Thermal Time Constant		TCT	minutes	14			17			20		
	Thermal Resistance		R_{thw-a}	°C/W	1.19			1.01			0.88		
	Pole Pairs				4			4			4		
	Heatsink Size				10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate		

Notes:

1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by:
   AKM31 = 0.0 N-m AKM32 = 0.05 N-m
   AKM33 = 0.1 N-m
8. Commutating encoder/SFD option: no continuous torque reduction.
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM31 = 0.0 N-m AKM32 = 0.1 N-m
   AKM33 = 0.2 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.047 N-m (0.41lb-in), and increase T_f by the same amount.

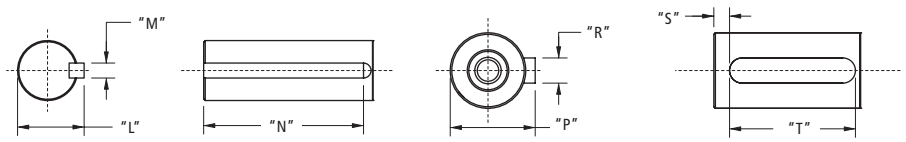


MOUNTING CODE	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"	"M"	"N"
AC	7 [.276]	80 +0.012 -0.007 [3.1496 +.0004 -.0002] j6	100 [3.937]	–	D M6 DIN 332	19 +0.015 +0.002 [.7480 +.0006 +.0001] k6	40.0 [1.57]	–	–	–
AN	7 [.276]	80 +0.012 -0.007 [3.1496 +.0004 -.0002] j6	100 [3.937]	–	D M6 DIN 332	19 +0.015 +0.002 [.7480 +.0006 +.0001] k6	40.0 [1.57]	–	–	–
BK	5.54 [.218]	73.025 0 -0.051 [2.8750 +.0000 -.0002]	98.43 [3.875]	–	–	15.875 0 -0.013 [.6250 +.0000 -.0005]	52.40 ± 0.79 [2.063 ± .031]	17.92 0 -0.43 [.706 +.000 -.017]	4.762 0 -0.050 [.1875 +.0000 -.0020]	34.93 ± 0.25 [1.375 ± .010]
CC	5.54 [.218]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	90 [3.543]	109 [4.291]	D M6 DIN 332	19 +0.015 +0.002 [.7480 +.0006 +.0001] k6	40.0 [1.57]	–	–	–
CN	5.54 [.218]	60 +0.012 -0.007 [2.3622 +.0004 -.0002] j6	90 [3.543]	109 [4.291]	D M6 DIN 332	19 +0.015 +0.002 [.7480 +.0006 +.0001] k6	40.0 [1.57]	–	–	–
EK	5.54 [.218]	73.025 0 -0.051 [2.8750 +.0000 -.0020]	98.43 [3.875]	–	–	12.700 0 -0.013 [.5000 +.0000 -.0005]	31.75 ± 0.25 [1.250 ± .010]	14.09 0 -0.43 [.555 +.000 -.017]	3.175 0 -0.050 [.1250 +.0000 -.0020]	19.05 ± 0.25 [.750 ± .010]

MOUNTING CODE	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	21.5 0 -0.13 [.846 +.000 -.005]	6 0 -0.03 [.236 +.000 -.001] N9	4.00 [1.57]	32 0 -0.30 [1.260 +.000 -.012]	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
AN	–	–	–	–	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
BK	–	–	–	–	0.051 [.0020]	0.10 [.004]	0.10 [.004]
CC	21.5 0 -0.13 [.846 +.000 -.005]	6 0 -0.03 [.236 +.000 -.001] N9	4.00 [1.57]	32 0 -0.30 [1.260 +.000 -.012]	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
CN	–	–	–	–	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
EK	–	–	–	–	0.051 [.0020]	0.10 [.004]	0.10 [.004]

(X)	Y MAX.	Z MAX. (W/ BRAKE)	MODEL
96.4 [3.80]	118.8 [4.68]	152.3 [6.00]	AKM41
125.4 [4.94]	147.8 [5.82]	181.3 [7.14]	AKM42
154.4 [6.08]	176.8 [6.96]	210.3 [8.28]	AKM43
183.4 [7.22]	205.8 [8.10]	239.3 [9.42]	AKM44

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

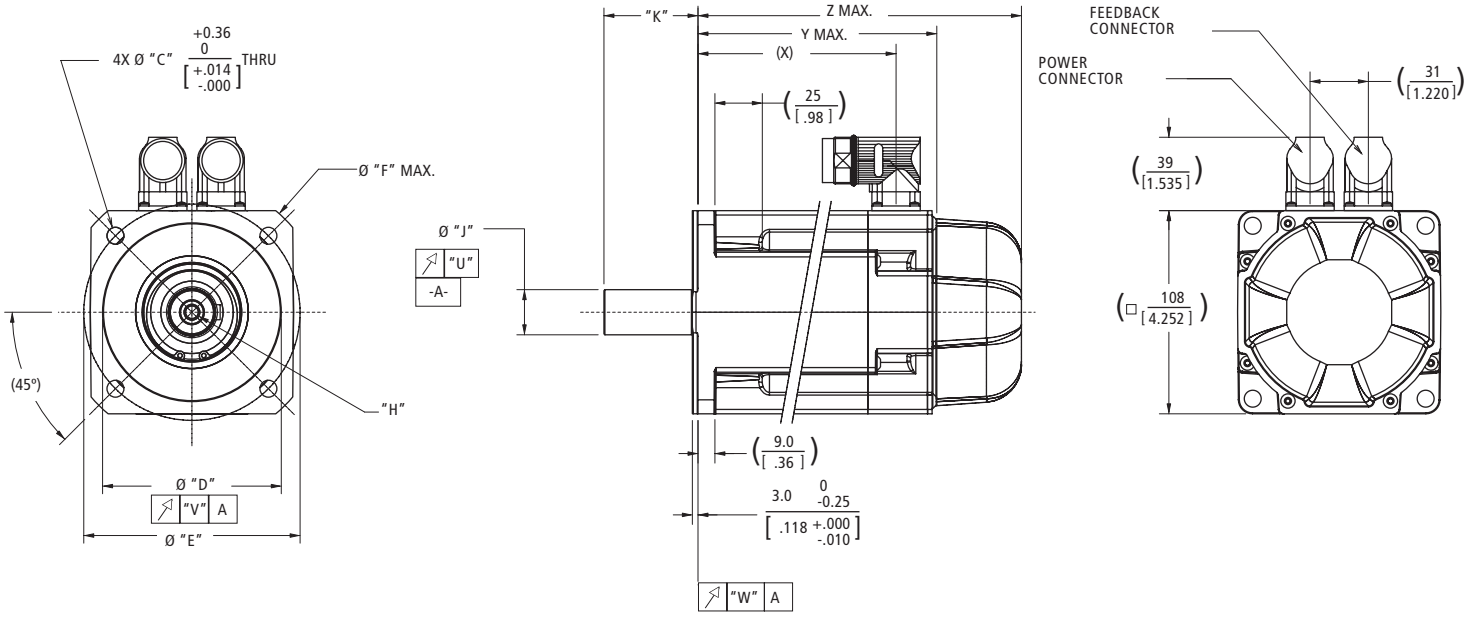


AKM4x - Up to 640 VDC

See system data beginning on page 8 for typical torque/speed performance.

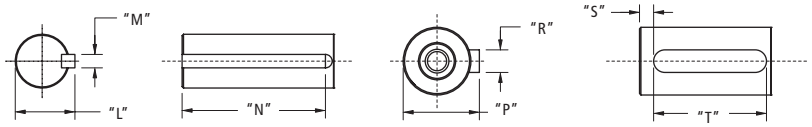
					AKM41			AKM42				AKM43			AKM44		
	PARAMETER	Tol	SYMBOL	UNITS	C	E	H	C	E	G	J	E	G	K	E	G	J
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	320	640	640	640	320	640	640	320	640	640	640
	Continuous Torque (Stall) for	Nom	T_{cs}	N-m	**1.95**	**2.02**	**2.06**	**3.35**	**3.42**	**3.53**	**3.56**	**4.70**	**4.80**	**4.90**	**5.76**	**5.88**	**6.00**
	ΔT winding = 100°C ①②⑦⑧⑨			lb-in	17.3	17.9	18.2	29.6	30.3	31.2	31.5	41.6	42.5	43.4	51.0	52.0	53.1
	Continuous Current (Stall) for	Nom	I_{cs}	A_{rms}	1.46	2.85	5.60	1.40	2.74	4.80	8.40	2.76	4.87	9.60	2.9	5.0	8.8
	ΔT winding = 100°C ①②⑦⑧⑨																
	Continuous Torque (Stall) for	Nom	T_{cs}	N-m	1.56	1.62	1.65	2.68	2.74	2.82	2.85	3.76	3.84	3.92	4.61	4.70	4.80
	ΔT winding = 60°C ②			lb-in	13.8	14.3	14,6	23,7	24.2	25.0	25.2	33.3	34.0	34.7	40.8	41.6	42.5
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Peak Torque ①②	Nom	T_p	N-m	6.12	6.28	6.36	11.1	11.3	11.5	11.6	15.9	16.1	16.3	19.9	20.2	20.4
				lb-in	54.2	55.6	56.3	98.8	99.7	102	103	141	142	144	176	179	181
	Peak Current	Nom	I_p	A_{rms}	5.8	11.4	22.4	5.61	11.0	19.2	33.7	11.0	19.5	38.3	11.4	20.0	35.2
75VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	-	-	1.99	-	-	-	-	-	-	-	-	-	-
				lb-in	-	-	17.6	-	-	-	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	1000	-	-	-	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	0.21	-	-	-	-	-	-	-	-	-	-
				Hp	-	-	0.28	-	-	-	-	-	-	-	-	-	-
160VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	-	1.94	1.86	-	-	-	3.03	-	-	4.08	-	-	-
				lb-in	-	17.2	16.5	-	-	-	26.8	-	-	36.1	-	-	-
	Rated Speed		N_{rtd}	rpm	-	1200	3000	-	-	-	3000	-	-	2500	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	0.24	0.58	-	-	-	0.95	-	-	1.07	-	-	-
				Hp	-	0.33	0.78	-	-	-	1.28	-	-	1.43	-	-	-
320VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	1.88	1.82	1.62	-	3.12	2.90	2.38	4.24	4.00	2.62	5.22	4.90	3.84
				lb-in	16.6	16.1	14.3	-	27.6	25.7	21.1	37.5	35.4	23.2	46.2	43.4	34.0
	Rated Speed		N_{rtd}	rpm	1200	3000	6000	-	1800	3500	6000	1500	2500	6000	1200	2000	4000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.24	0.57	1.02	-	0.59	1.06	1.50	0.67	1.05	1.65	0.66	1.03	1.61
				Hp	0.32	0.77	1.36	-	0.79	1.42	2.00	0.89	1.40	2.21	0.88	1.38	2.16
560VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	1.77	1.58	-	3.10	2.81	2.35	-	3.92	3.01	-	4.80	3.76	2.75
				lb-in	15.7	14.0	-	27.4	24.9	20.8	-	34.7	26.6	-	42.5	33.3	24.3
	Rated Speed		N_{rtd}	rpm	3000	6000	-	1500	3500	6000	-	2500	5000	-	2000	4000	6000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.56	0.99	-	0.49	1.03	1.48	-	1.03	1.58	-	1.01	1.57	1.73
				Hp	0.75	1.33	-	0.65	1.38	1.98	-	1.38	2.11	-	1.35	2.11	2.32
640VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	1.74	1.58	-	3.02	2.72	2.35	-	3.76	2.57	-	4.56	3.19	2.75
				lb-in	15.4	14.0	-	26.7	24.1	20.8	-	33.3	22.7	-	40.4	28.2	24.3
	Rated Speed		N_{rtd}	rpm	3500	6000	-	2000	4000	6000	-	3000	6000	-	2500	5000	6000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.64	0.99	-	0.63	1.14	1.48	-	1.18	1.61	-	1.19	1.67	1.73
				Hp	0.85	1.33	-	0.85	1.53	1.98	-	1.58	2.16	-	1.60	2.24	2.32
	Torque Constant ①	±10%	K_t	$N\text{-m}/A_{rms}$	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
				$lb\text{-in}/A_{rms}$	11.9	6.3	3.3	21.2	11.2	6.5	3.8	15.2	8.8	4.6	18.1	10.5	6.1
	Back EMF constant ⑥	±10%	K_e	V/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 (line-line) ⑥	±10%	R_m		21.7	5.7	1.51	27.52	7.22	2.38	0.80	8.04	2.81	0.70	8.64	2.65	0.88
	Inductance (line-line)		L	mH	66.1	18.4	5.0	97.4	26.8	9.2	3.1	32.6	10.8	2.9	33.9	11.5	3.8
	Inertia		J_m	$kg\text{-}cm^2$	0.81			1.5				2.1			2.7		
	(includes Resolver feedback) ③			$lb\text{-}in\text{-}s^2$	7.2E-04			1.3E-03				1.8E-03			2.4E-03		
	Optional Brake Inertia		J_m	$kg\text{-}cm^2$	0.068			0.068				0.068			0.068		
	(additional)			$lb\text{-}in\text{-}s^2$	6.0E-05			6.0E-05				6.0E-05			6.0E-05		
	Weight		W	kg	2.44			3.39				4.35			5.3		
				lb	5.4			7.5				9.6			11.7		
	Static Friction ①⑩		T_f	N-m	0.014			0.026				0.038			0.05		
				lb-in	0.12			0.23				0.34			0.44		
	Viscous Damping ①		K_{dv}	$N\text{-m}/k_{rpm}$	0.009			0.013				0.017			0.021		
				$lb\text{-in}/k_{rpm}$	0.08			0.12				0.15			0.19		
	Thermal Time Constant		TCT	minutes	13			17				20			24		
	Thermal Resistance		$R_{thw\text{-}a}$	°C/W	1.04			0.89				0.78			.71		
	Pole Pairs				5			5				5			5		
	Heatsink Size				10″x10″x¼″ Aluminum Plate			10″x10″x¼″ Aluminum Plate				10″x10″x¼″ Aluminum Plate			10″x10″x¼″ Aluminum Plate		

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by 0.12 N-m.
8. Commutating encoder/SFD options reduces continuous ratings by:
   AKM41 = 0.1 N-m AKM42 = 0.1 N-m
   AKM43 = 0.2 N-m AKM44 = 0.3 N-m
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM41 = 0.22 N-m AKM42 = 0.36 N-m
   AKM43 = 0.55 N-m AKM44 = 0.76 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.071 N-m (0.63lb-in), and increase T_f by the same amount.



MOUNTING CODE	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"	"M"	"N"
AC	9 [.354]	110 +0.013 -0.009 [4.3307 +.0005 -.0003] j6	130 [5.118]	–	D M8 DIN 332	24 +0.015 +0.002 [.9449 +.0006 +.0001] k6	50.0 [1.97]	–	–	–
AN	9 [.354]	110 +0.013 -0.009 [4.3307 +.0005 -.0003] j6	130 [5.118]	–	D M8 DIN 332	24 +0.015 +0.002 [.9449 +.0006 +.0001] k6	50.0 [1.97]	–	–	–
BK	8.33 [.328]	55.563 0 -0.051 [2.1874 +.0000 -.0020]	125.73 [4.950]	–	–	19.05 +0 -0.013 [.7500 +.0000 -.0005]	57.15 ± 0.79 [2.250 ± .031]	21.15 0 -0.43 [.833 +.000 -.017]	4.763 0 -0.050 [.1875 +.0000 -.0020]	38.1 ± 0.25 [1.500 ± .010]
CC	9 [.354]	95 +0.013 -0.009 [3.7402 +.0005 -.0003] j6	115 [4.528]	140 [5.512]	D M8 DIN 332	24 +0.015 +0.002 [.9449 +.0006 +.0001] k6	50.0 [1.97]	–	–	–
CN	9 [.354]	95 +0.013 -0.009 [3.7402 +.0005 -.0003] j6	115 [4.528]	140 [5.512]	D M8 DIN 332	24 +0.015 +0.002 [.9449 +.0006 +.0001] k6	50.0 [1.97]	–	–	–
DK	8.33 [.328]	63.5 0 -0.05 [2.500 +.000 -.002]	127 [5.000]	–	–	19.05 +0 -0.013 [.7500 +.0000 -.0005]	57.15 ± 0.79 [2.250 ± .031]	21.15 0 -0.43 [.833 +.000 -.017]	4.763 0 -0.050 [.1875 +.0000 -.0020]	38.1 ± 0.25 [1.500 ± .010]

MOUNTING CODE	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	27 0 -0.29 [1.063 +.000 -.011]	8 0 -0.036 [.3150 +.0000 -.0014] N9	5.00 [1.97]	40 0 -0.30 [1.575 +.000 -.012]	0.040 [.0015]	0.100 [.0039]	0.100 [.0039]
AN	–	–	–	–	0.040 [.0015]	0.100 [.0039]	0.100 [.0039]
BK	–	–	–	–	0.051 [.0020]	0.10 [.004]	0.10 [.004]
CC	27 0 -0.29 [1.063 +.000 -.011]	8 0 -0.036 [.3150 +.0000 -.0014] N9	5.00 [1.97]	40 0 -0.30 [1.575 +.000 -.012]	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
CN	–	–	–	–	0.040 [.0015]	0.080 [.0031]	0.080 [.0031]
DK	–	–	–	–	0.051 [.0020]	0.05 [.002]	0.10 [.004]



Z MAX. SINE ENCODER (NO BRAKE)	Z MAX. SINE ENCODER (W/ BRAKE)	(X)	Y MAX.	Z MAX. (W/ BRAKE)	MODEL
146.0 [5.75]	189.0 [7.44]	105.3 [4.15]	127.5 [5.02]	172.5 [6.79]	AKM51
177.0 [8.97]	220.0 [8.66]	136.3 [5.37]	158.5 [6.24]	203.5 [8.01]	AKM52
208.0 [8.19]	251.0 [9.88]	167.3 [6.59]	189.5 [7.46]	234.5 [9.23]	AKM53
239.0 [9.41]	282.0 [11.10]	198.3 [7.81]	220.5 [8.68]	265.5 [10.45]	AKM54

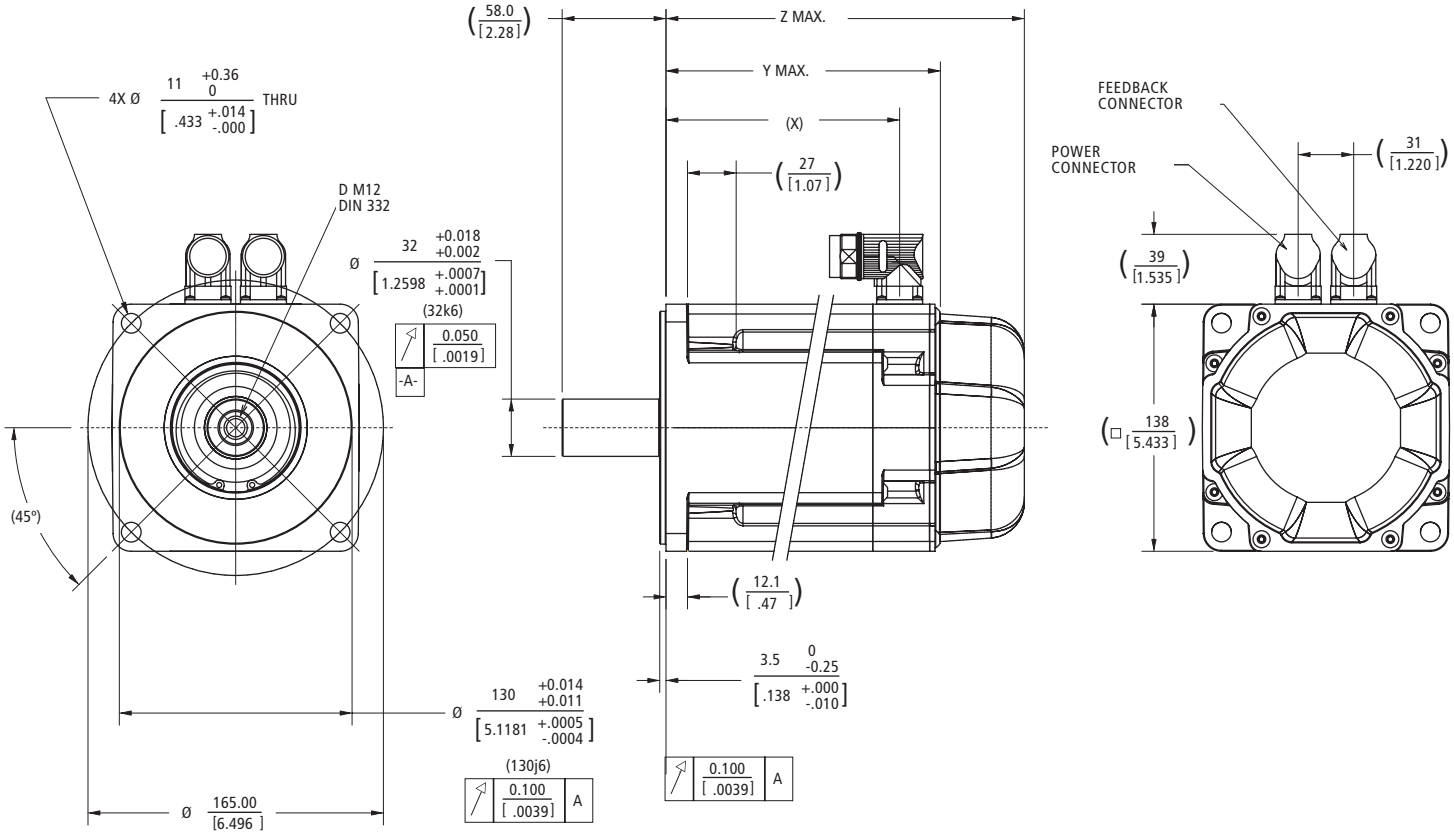
Dimensions are in mm [inches].
Product designed in metric.
English conversions provided for reference only.

AKM5x - Up to 640 VDC

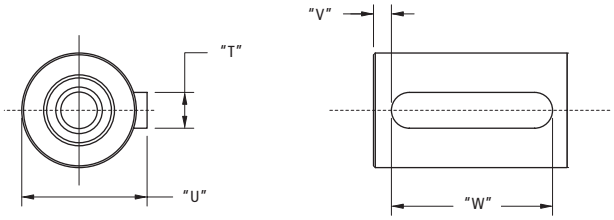
See system data beginning on page 8 for typical torque/speed performance.

					AKM51			AKM52				AKM53				AKM54			
	PARAMETER	Tol	SYMBOL	UNITS	E	G	K	E	G	K	M	G	K	M	P	G	K	L	N
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	320	640	640	640	320	640	640	320	320	640	640	560	320
	Continuous Torque (Stall) for	Nom	T_{cs}	N-m	4.70	4.75	4.90	8.34	8.43	8.60	8.60	11.4	11.6	11.4	11.4	14.3	14.4	14.1	14.1
	ΔT winding = 100°C ①②⑦⑧⑨			lb-in	41.6	42.0	43.4	73.8	74.6	76.1	76.1	101	103	101	101	126	127	125	125
	Continuous Current (Stall) for	Nom	I_{cs}	A_{rms}	2.75	4.84	9.4	2.99	4.72	9.3	13.1	4.77	9.4	13.4	19.1	5.0	9.7	12.5	17.8
	ΔT winding = 100°C ①②⑦⑧⑨																		
	Continuous Torque (Stall) for	Nom	T_{cs}	N-m	3.76	3.80	3.92	6.67	6.74	6.88	6.88	9.10	9.28	9.10	9.10	11.4	11.5	11.3	11.3
	ΔT winding = 60°C ②			lb-in	33.3	33.6	34.7	59.0	59.7	61.0	61.0	80.5	82.1	80.5	80.5	101	102	100	100
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Peak Torque ①②	Nom	T_p	N-m	11.6	11.7	12.0	21.3	21.5	21.9	21.9	29.7	30.1	29.8	29.8	37.8	38.4	37.5	37.6
				lb-in	103	104	106	189	190	194	194	263	266	264	264	335	340	332	333
	Peak Current	Nom	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
75VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	4.15	-	-	-	-	-	-	-	-	-	-	-	-
				lb-in	-	-	36.7	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	2500	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	1.09	-	-	-	-	-	-	-	-	-	-	-	-
				Hp	-	-	1.46	-	-	-	-	-	-	-	-	-	-	-	-
320VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	4.41	4.02	2.35	-	7.69	6.80	5.20	10.7	10.1	8.72	5.88	-	12.7	11.5	9.85
				lb-in	39.0	35.6	20.8	-	68.1	60.2	46.0	94.5	89.4	77.2	52.0	-	112	102	87.2
	Rated Speed		N_{rtd}	rpm	1200	2500	5500	-	1500	3000	4500	1000	2000	3000	5000	-	1800	2500	3500
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	0.55	1.05	1.35	-	1.21	2.14	2.45	1.12	2.12	2.74	3.08	-	2.39	3.00	3.61
				Hp	0.74	1.41	1.81	-	1.62	2.86	3.28	1.50	2.84	3.67	4.13	-	3.20	4.03	4.84
560VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	3.98	2.62	-	7.61	7.06	3.90	-	9.85	7.65	-	-	12.9	10.05	8.13	-
				lb-in	35.2	23.2	-	67.3	62.5	34.5	-	87.2	67.7	-	-	114	88.9	72.0	-
	Rated Speed		N_{rtd}	rpm	2500	5000	-	1500	2500	5500	-	2000	4000	-	-	1500	3500	4500	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	1.04	1.37	-	1.20	1.85	2.25	-	2.06	3.20	-	-	2.03	3.68	3.83	-
				Hp	1.40	1.84	-	1.60	2.48	3.01	-	2.77	4.30	-	-	2.72	4.94	5.14	-
640VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	3.80	1.94	-	7.28	6.66	3.25	-	9.50	6.85	-	-	12.3	9.25	-	-
				lb-in	33.6	17.2	-	64.4	58.9	28.7	-	84.0	60.8	-	-	109	81.9	-	-
	Rated Speed		N_{rtd}	rpm	3000	6000	-	2000	3000	6000	-	2400	4500	-	-	2000	4000	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	k-W	1.19	1.22	-	1.52	2.09	2.04	-	2.39	3.23	-	-	2.57	3.87	-	-
				Hp	1.60	1.63	-	2.04	2.80	2.74	-	3.20	4.33	-	-	3.45	5.19	-	-
	Torque Constant ①	±10%	K_t	$N\text{-m}/A_{rms}$	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
				$lb\text{-in}/A_{rms}$	15.2	8.8	4.6	24.7	15.8	8.2	5.8	21.2	11.0	7.5	5.3	25.5	13.3	10.0	7.1
	Back EMF constant ⑥	±10%	K_e	V/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 (line-line) ⑥	±10%	R_m		8.47	2.87	0.75	8.59	3.47	0.93	0.48	3.75	1	0.51	0.27	3.8	1.02	0.63	0.33
	Inductance (line-line)		L	mH	36.6	12.1	3.4	44.7	18.5	5.0	2.5	21.3	5.7	2.7	1.3	22.9	6.2	3.5	1.8
	Inertia		J_m	$kg\text{-cm}^2$	3.4			6.2				9.1				12			
	(includes Resolver feedback) ③			$lb\text{-in-s}^2$	3.0E-03			5.5E-03				8.1E-03				0.011			
	Optional Brake Inertia		J_m	$kg\text{-cm}^2$	0.17			0.17				0.17				0.17			
	(additional)			$lb\text{-in-s}^2$	1.5E-04			1.5E-04				1.5E-04				1.5E-04			
	Weight		W	kg	4.2			5.8				7.4				9			
				lb	9.3			12.8				16.3				19.8			
	Static Friction ①⑩		T_f	N-m	0.022			0.04				0.058				0.077			
				lb-in	0.19			0.35				0.51				0.68			
	Viscous Damping ①		K_{dv}	$N\text{-m}/k_{rpm}$	0.033			0.042				0.052				0.061			
				$lb\text{-in}/k_{rpm}$	0.29			0.37				0.46				0.54			
	Thermal Time Constant		TCT	minutes	20			24				28				31			
	Thermal Resistance		R_{thw-a}	°C/W	0.75			0.62				0.55				0.50			
	Pole Pairs				5			5				5				5			
	Heatsink Size				12"x12"x$^1/_2$" Aluminum Plate			12"x12"x$^1/_2$" Aluminum Plate				12"x12"x$^1/_2$" Aluminum Plate				12"x12"x$^1/_2$" Aluminum Plate			

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by:
   AKM51 = 0.15 N-m AKM52 = 0.26 N-m
   AKM53 = 0.35 N-m AKM54 = 0.43 N-m
8. Commutating encoder/SFD option reduces continuous torque ratings by:
   AKM51 = 0.15 N-m AKM52 = 0.34 N-m
   AKM53 = 0.58 N-m AKM54 = 0.86 N-m
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM51 = 0.39 N-m AKM52 = 0.76 N-m
   AKM53 = 1.13 N-m AKM54 = 1.55 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.013 N-m (0.1.2lb-in), and increase T_f by the same amount.



MOUNTING CODE	"T"	"U"	"V"	"W"
AC	10 0 -0.036 N9 [.3937 +.0000 -.0014]	35 0 -0.29 [1.378 +.000 -.011]	5.00 [.197]	45 0 -0.30 [1.772 +.000 -.012]
AN	–	–	–	–



Z MAX. SINE ENCODER (NO BRAKE)	Z MAX. SINE ENCODER (W/ BRAKE)	(X)	Y MAX.	Z MAX. (W/ BRAKE)	MODEL
172.2 [6.78]	218.7 [8.85]	130.5 [5.14]	153.7 [6.05]	200.7 [7.90]	AKM62
197.2 [7.76]	224.7 [9.63]	155.5 [6.12]	178.7 [7.04]	225.7 [8.89]	AKM63
222.2 [8.75]	268.7 [10.62]	180.5 [7.11]	203.7 [8.02]	250.7 [9.87]	AKM64
247.2 [9.73]	294.7 [11.60]	205.5 [8.09]	228.7 [9.00]	275.7 [10.85]	AKM65

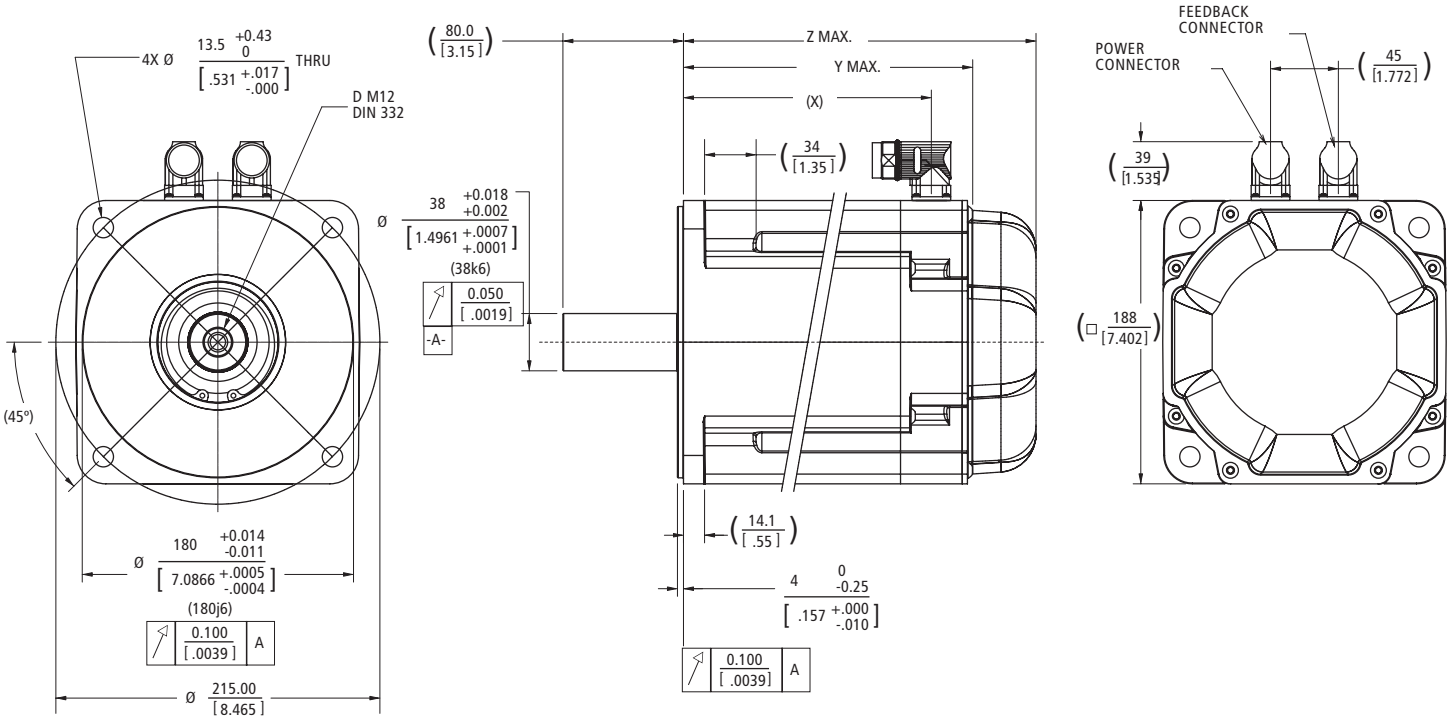
Dimensions are in mm [inches].
Product designed in metric.
English conversions provided for reference only.

AKM6x - Up to 640 VDC

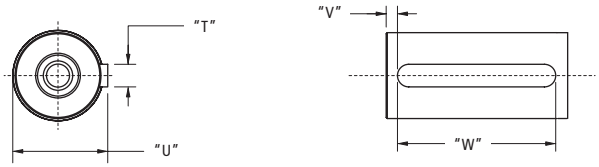
See system data beginning on page 8 for typical torque/speed performance.

					AKM62				AKM63				AKM64			AKM65		
	PARAMETER	Tol	SYMBOL	UNITS	G	K	M	P	G	K	M	N	K	L	P	K	M	N
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	640	320	640	640	640	640	640	640	640	640	640	640
	Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T_{cs}	N-m	11.9	12.2	12.2	12.3	16.5	16.8	17.0	17.0	20.8	21.0	20.4	24.8	25.0	24.3
				lb-in	105	108	108	109	146	149	150	150	184	186	181	219	221	215
	Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	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
	Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T_{cs}	N-m	9.49	9.72	9.72	9.83	13.2	13.4	13.6	13.6	16.6	16.8	16.3	19.8	20.0	19.4
				lb-in	84.0	86.0	86.0	87.0	117	119	120	120	147	149	144	175	177	172
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Peak Torque ①②	Nom	T_p	N-m	29.8	30.1	30.2	30.4	41.8	42.6	43.0	43.0	53.5	54.1	52.9	64.5	65.2	63.7
				lb-in	264	266	267	269	370	377	381	381	473	479	468	571	577	564
	Peak Current	Nom	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
75VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	-	10.4	9.50	8.10	-	14.9	14.3	13.0	18.8	18.4	16.0	22.8	21.9	19.8
				lb-in	-	92.0	84.1	71.7	-	132	127	115	166	163	142	202	194	175
	Rated Speed		N_{rtd}	rpm	-	2000	3000	4500	-	1500	2000	3000	1200	1500	2500	1000	1500	2000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	2.18	2.98	3.82	-	2.34	2.99	4.08	2.36	2.89	4.19	2.39	3.44	4.15
				Hp	-	2.92	4.00	5.12	-	3.14	4.01	5.47	3.17	3.87	5.62	3.20	4.61	5.56
560VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	10.4	9.00	5.70	-	14.9	12.9	11.3	9.60	17.2	15.6	11.9	20.2	19.2	16.0
				lb-in	92.0	79.7	50.4	-	132	114	100	85.0	152	138	105	179	170	142
	Rated Speed		N_{rtd}	rpm	1800	3500	6000	-	1200	3000	4000	5000	2000	3000	4500	2000	2500	3500
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	1.96	3.30	3.58	-	1.87	4.05	4.73	5.03	3.60	4.90	5.61	4.23	5.03	5.86
				Hp	2.63	4.42	4.80	-	2.51	5.43	6.34	6.74	4.83	6.57	7.52	5.67	6.74	7.86
640VDC	Rated Torque (speed) ①②⑦⑧⑨⑩		T_{rtd}	N-m	10.2	8.00	5.70	-	14.6	12.0	10.5	7.00	16.3	14.4	9.00	19.7	18.1	14.7
				lb-in	90.3	70.8	50.4	-	129	106	92.9	62.0	144	127	80.0	174	160	130
	Rated Speed		N_{rtd}	rpm	2000	4500	6000	-	1500	3500	4500	6000	2500	3500	5500	2200	3000	4000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	2.14	3.77	3.58	-	2.29	4.40	4.95	4.40	4.27	5.28	5.18	4.54	5.69	6.16
				Hp	2.86	5.05	4.80	-	3.07	5.90	6.63	5.90	5.72	7.07	6.95	6.08	7.62	8.25
	Torque Constant ①	±10%	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
				lb-in/A_{rms}	21.9	11.3	8.1	5.8	32.7	15.1	11.0	8.7	20.2	14.7	9.7	22.5	16.4	12.2
	Back EMF constant ⑥	±10%	K_e	V/k_{rpm}	159	82.1	58.8	42.2	238	110	79.9	63.3	147	107	71.0	164	119	88.8
	Resistance (line-line) ⑥	±10%	R_m		3.94	1.05	0.55	0.30	5.16	1.09	0.58	0.38	1.34	0.71	0.36	1.27	0.68	0.42
	Inductance (line-line)		L	mH	31.7	8.5	4.4	2.2	43.5	9.3	4.9	3.1	11.8	6.2	2.8	11.4	6.1	3.4
	Inertia (includes Resolver feedback) ③		J_m	kg-cm²	17				24				32			40		
				lb-in-s²	0.015				0.021				0.028			0.035		
	Optional Brake Inertia (additional)		J_m	kg-cm²	0.61				0.61				0.61			0.61		
				lb-in-s²	5.4E-04				5.4E-04				5.4E-04			5.4E-04		
	Weight		W	kg	8.9				11.1				13.3			15.4		
				lb	19.6				24.4				29.3			33.9		
	Static Friction ①⑩		T_f	N-m	0.05				0.1				0.15			0.2		
				lb-in	0.44				0.9				1.3			1.8		
	Viscous Damping ①		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		
	Thermal Time Constant		TCT	minutes	20				25				30			35		
	Thermal Resistance		R_{thw-a}	°C/W	0.48				0.44				0.41			0.38		
	Pole Pairs				5				5				5			5		
	Heatsink Size				18″x18″x½″ Aluminum Plate				18″x18″x½″ Aluminum Plate				18″x18″x½″ Aluminum Plate			18″x18″x½″ Aluminum Plate		

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by:
   AKM62 = 0.5 N-m AKM63 = 0.9 N-m
   AKM64 = 1.3 N-m AKM65 = 1.7 N-m
8. Commutating encoder/SFD option reduces continuous torque ratings by:
   AKM62 = 0.9 N-m AKM63 = 1.2 N-m
   AKM64 = 1.5 N-m AKM65 = 1.8 N-m
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM62 = 1.6 N-m AKM63 = 2.4 N-m
   AKM64 = 3.1 N-m AKM65 = 4.0 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.25 N-m (2.21 lb-in), and increase T_f by the same amount.



MOUNTING CODE	"T"	"U"	"V"	"W"
AC	10 0 -0.036 N9 [.3937 +.0000 -.0014]	41 0 -0.29 [1.614 +.000 -.011]	5.00 [.197]	70 0 -0.30 [2.756 +.000 -.012]
AN	–	–	–	–



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

Z MAX. SINE ENCODER (NO BRAKE)	Z MAX. SINE ENCODER (W/ BRAKE)	(X)	Y MAX.	Z MAX. (W/ BRAKE)	MODEL
201.7 [7.94]	253.3 [9.97]	164.5 [6.48]	192.5 [7.58]	234.5 [9.23]	AKM72
235.7 [9.38]	287.3 [11.31]	198.5 [7.81]	226.5 [8.92]	268.5 [10.57]	AKM73
269.7 [10.62]	321.3 [12.65]	232.5 [9.15]	260.5 [10.26]	302.5 [11.91]	AKM74

AKM7x - Up to 640 VDC

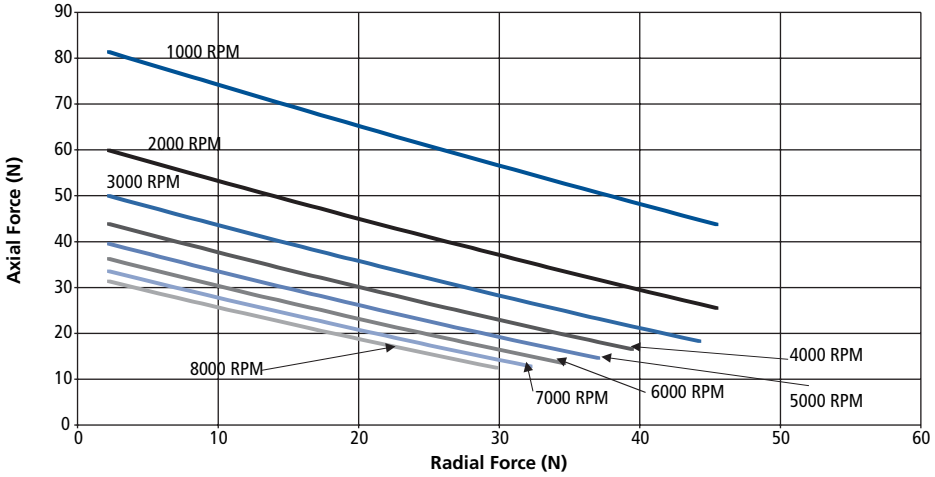
See system data beginning on page 8 for typical torque/speed performance.

	PARAMETER	Tol	SYMBOL	UNITS	AKM72 K	AKM72 M	AKM72 P	AKM73 M	AKM73 P	AKM74 L	AKM74 P
	Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	640	640	640	640	640
	Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T_{cs}	N-m	29.7	30.0	29.4	42.0	41.6	53.0	52.5
				lb-in	263	266	260	372	368	469	465
	Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	I_{cs}	A_{rms}	9.3	13.0	18.7	13.6	19.5	12.9	18.5
	Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T_{cs}	N-m	23.8	24.0	23.5	33.6	33.3	42.4	42.0
				lb-in	211	212	208	297	295	375	372
	Max Mechanical Speed ⑤	Nom	N_{max}	rpm	6000	6000	6000	6000	6000	6000	6000
	Peak Torque ①②	Nom	T_p	Nm	79.2	79.7	78.5	113	111	143	142
				lb-in	701	705	695	997	985	1269	1253
	Peak Current	Nom	I_p	A_{rms}	27.8	38.9	56.1	40.8	58.6	38.7	55.5
75VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	-	-	-	-	-	-	-
				lb-in	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	-	-	-	-
				Hp	-	-	-	-	-	-	-
160VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	-	-	-	-	-	-	-
				lb-in	-	-	-	-	-	-	-
	Rated Speed		N_{rtd}	rpm	-	-	-	-	-	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	-	-	-	-	-
				Hp	-	-	-	-	-	-	-
320VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	-	-	23.8	-	34.7	-	-
				lb-in	-	-	211	-	307	-	-
	Rated Speed		N_{rtd}	rpm	-	-	1800	-	1300	-	-
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	-	-	4.49	-	4.72	-	-
				Hp	-	-	6.01	-	6.33	-	-
560VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	25.1	23.6	20.1	33.8	28.5	43.5	39.6
				lb-in	222	209	178	299	252	385	350
	Rated Speed		N_{rtd}	rpm	1500	2000	3000	1500	2400	1200	1800
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	3.94	4.94	6.31	5.31	7.16	5.47	7.46
				Hp	5.29	6.63	8.46	7.12	9.60	7.33	10.01
640VDC	Rated Torque (speed) ①②⑦⑧⑨ ⑩		T_{rtd}	N-m	24.0	22.1	18.2	32.1	26.3	41.5	35.9
				lb-in	212	196	161	284	233	367	318
	Rated Speed		N_{rtd}	rpm	1800	2500	3500	1800	2800	1400	2000
	Rated Power (speed) ①②⑦⑧⑨		P_{rtd}	kW	4.52	5.79	6.67	6.05	7.71	6.08	7.52
				Hp	6.06	7.76	8.94	8.11	10.34	8.16	10.08
	Torque Constant ①	±10%	K_t	$N\text{-}m/A_{rms}$	3.23	2.33	1.58	3.10	2.13	4.14	2.84
				$lb\text{-}in/A_{rms}$	28.6	20.6	14.0	27.4	18.9	36.6	25.1
	Back EMF constant ⑥	±10%	K_e	V/k_{rpm}	208	150	102	200	137	266	183
	Resistance (line-line) ⑥	±10%	R_m		1.22	0.64	0.33	0.68	0.35	0.85	0.43
	Inductance (line-line)		L	mH	20.7	10.8	5.0	12.4	5.9	16.4	7.7
	Inertia (includes Resolver feedback) ③		J_m	$kg\text{-}cm^2$	65			92		120	
				$lb\text{-}in\text{-}s^2$	0.057			0.082		0.11	
	Optional Brake Inertia (additional)		J_m	$kg\text{-}cm^2$	1.64			1.64		1.64	
				$lb\text{-}in\text{-}s^2$	1.46×10^{-3}			1.46×10^{-3}		1.46×10^{-3}	
	Weight		W	kg	19.7			26.7		33.6	
				lb	43.4			58.8		74.0	
	Static Friction ①⑩		T_f	N-m	0.16			0.24		0.33	
				lb-in	1.4			2.1		2.9	
	Viscous Damping ①		K_{dv}	$N\text{-}m/k_{rpm}$	0.06			0.13		0.2	
				$lb\text{-}in/k_{rpm}$	0.5			1.2		1.8	
	Thermal Time Constant		TCT	minutes	46			53		60	
	Thermal Resistance		$R_{thw\text{-}a}$	°C/W	0.43			0.37		0.33	
	Pole Pairs				5			5		5	
	Heatsink Size				18"x18"x½" Aluminum Plate			18"x18"x½" Alum. Plate		18"x18"x½" Alum. Plate	

Notes:
1. Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
2. All data referenced to sinusoidal commutation.
3. Add parking brake if applicable for total inertia.
4. Motor with standard heatsink.
5. May be limited at some values of Vbus.
6. Measured at 25°C.
7. Brake motor option reduces continuous torque ratings by 1 N-m.
8. Commutating encoder/SFD option reduces continuous torque ratings by:
   AKM72 = 2.0 N-m AKM73 = 2.7 N-m
   AKM74 = 3.4 N-m
9. Brake plus commutating encoder/SFD motor option reduces continuous torque ratings by:
   AKM72 = 3.9 N-mAKM73 = 5.1 N-m
   AKM74 = 6.2 N-m
10. For motors with optional shaft seal, reduce torque shown by 0.25 N-m (2.21 lb-in), and increase T_f by the same amount.

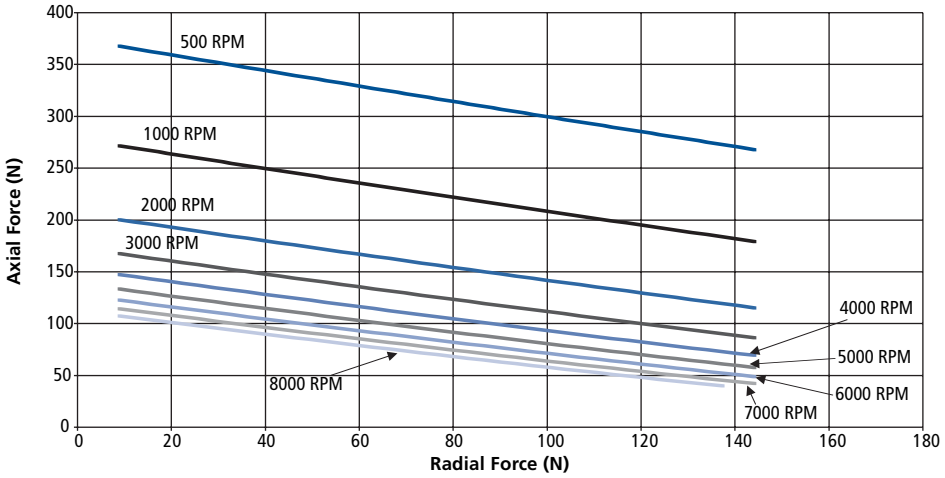
AKM1 MOTORS

20,000 HOURS L_{10} BEARING LIFE



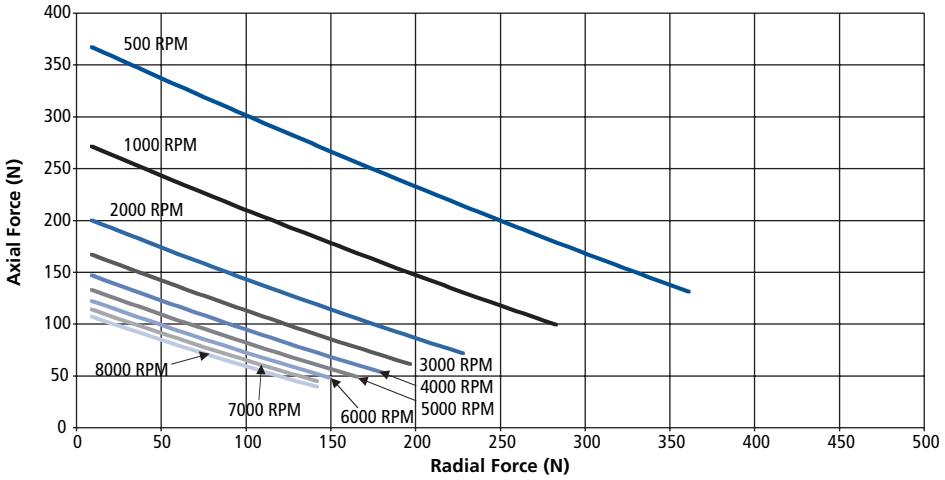
AKM2 MOTORS

20,000 HOURS L_{10} BEARING LIFE



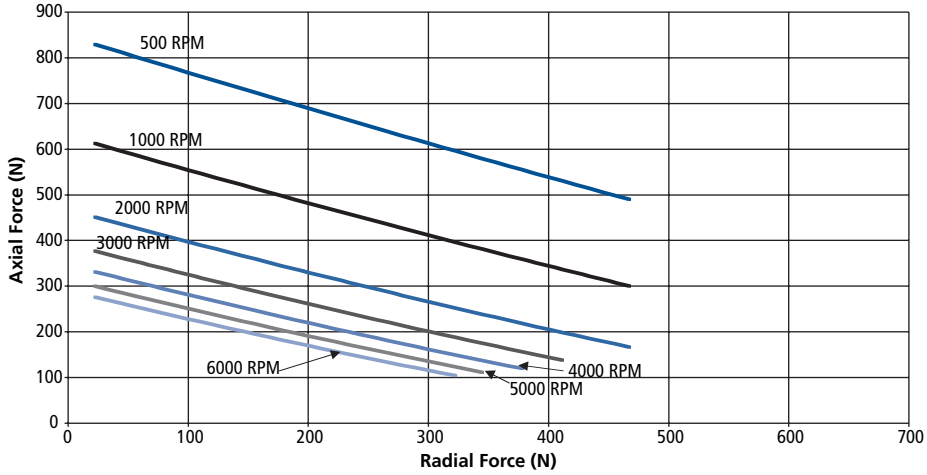
AKM3 MOTORS

20,000 HOURS L_{10} BEARING LIFE



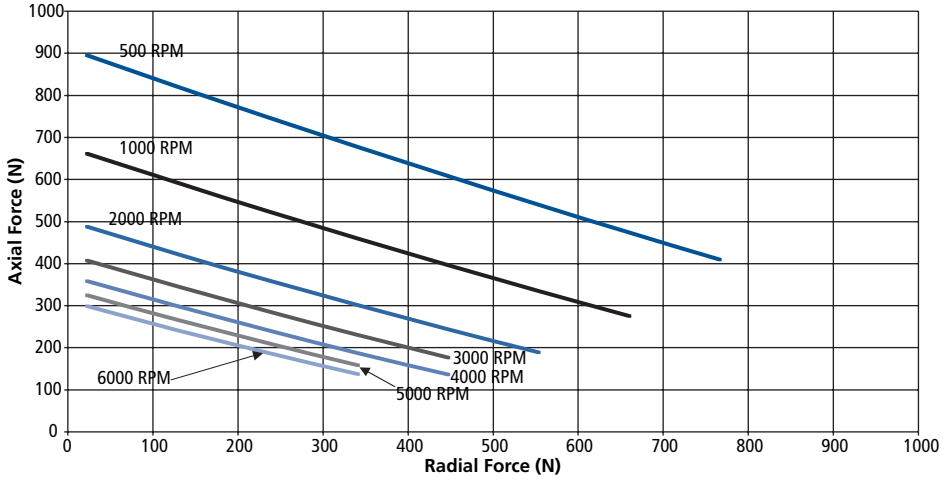
AKM4 MOTORS

20,000 HOURS L_{10} BEARING LIFE



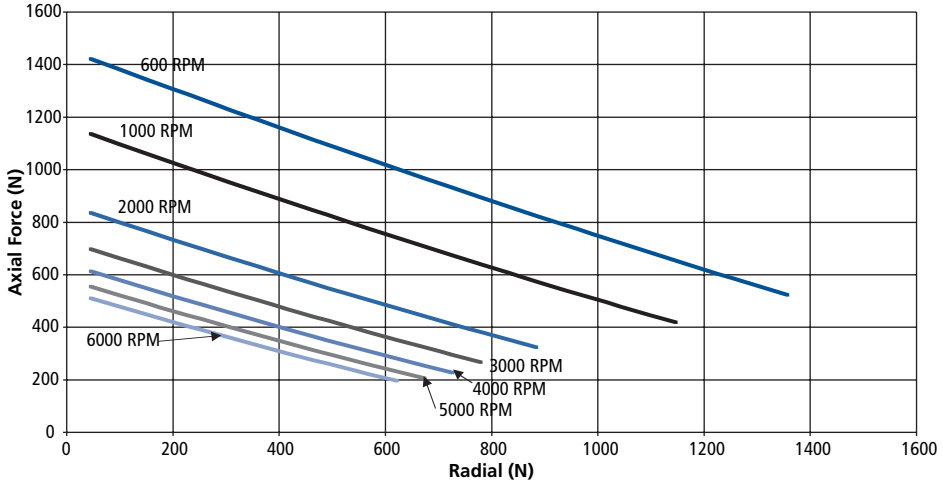
AKM5 MOTORS

20,000 HOURS L_{10} BEARING LIFE



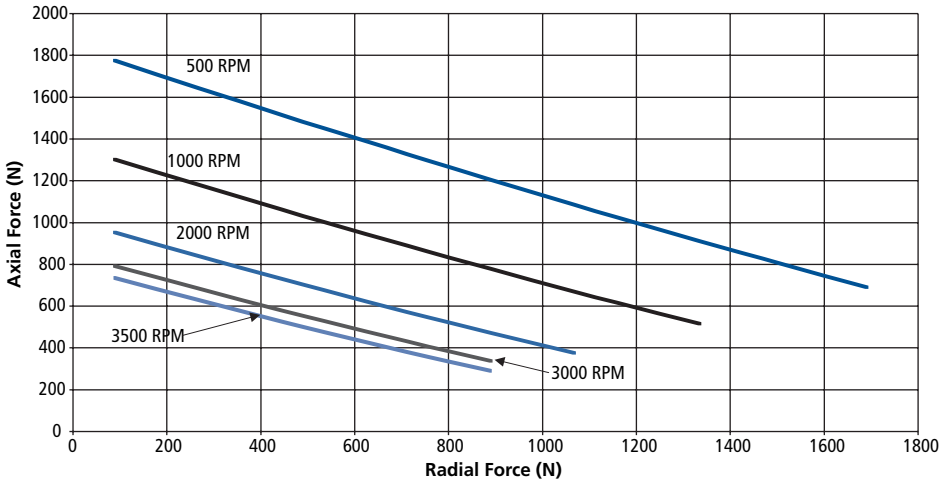
AKM6 MOTORS

20,000 HOURS L_{10} BEARING LIFE



AKM7 MOTORS

20,000 HOURS L_{10} BEARING LIFE



Shaft Loading

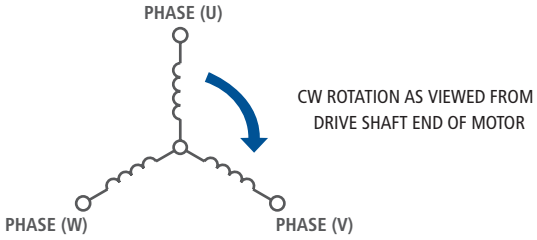
MOTOR	MAX RADIAL FORCE (N)	MAX AXIAL FORCE (N)
AKM1	48	200
AKM2	150	600
AKM3	340	600
AKM4	500	1400
AKM5	830	1740
AKM6	1940	2200
AKM7	2300	3000

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. Excluding AKM4X-EK which is rated at 240N max. radial force.
3. Infinite life with 99% reliability.
4. Safety factor = 2.

Phasing Diagram - All Motors

MOTOR WINDING CONFIGURATION



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.

2A 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.

2B Optional KTY84-130 Nominal Resistance at 25°C, 603 ohms.

2C Optional KTY83-110 Nominal Resistance at 25°C, 1000 ohms.

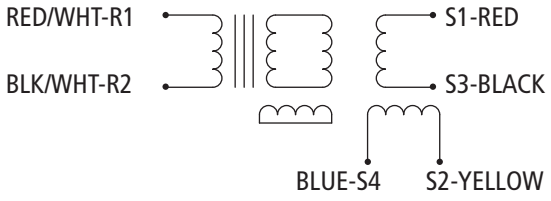
3 When optional shaft seal is included on front shaft extension, note that static friction stated in catalog or on winding data sheet is measured without shaft seal installed.

4 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.

RESOLVER (PRIMARY FEEDBACK)

RESOLVER DATA	UNITS	AKM 1	AKM 2,3,4	AKM 5,6,7
TYPE		1 SPEED	1 SPEED	1 SPEED
INPUT VOLTAGE	V_{RMS}	7.0	7.0	7.0
	k Hz	10	10	10
INPUT CURRENT MAX.	mA	30	30	30
TRANSFORMATION RATIO	10 %	0.5	0.5	0.5
NULL VOLTAGE	mVrms	50	50	50
MAX. ERROR (pk-pk)	MINS.	30	16	16
PHASE SHIFT		TBD	TBD	TBD
OPERATING TEMP.	°C	-55° to 155°	-55° to 155°	-55° to 155°
ROTOR INERTIA MAX.	kg cm^2	0.002	0.046	0.497

RESOLVER WINDING CONFIGURATION



$E_{R1-R2} = E \sin(\omega T)$

$E_{S1-S3} = KE_{R1-R2} \sin\Phi$

$E_{S2-S4} = KE_{R1-R2} \cos\Phi$

RESOLVER ALIGNMENT

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

AKM Series Motors with SFD (Smart Feedback Device)

The Smart Feedback Device (SFD) communicates with the drive over a 4 wire interface. Two wires supply +5V power at <150 mA and the second pair is an RS-485 digital communications link. The device includes EEPROM memory to save motor parameters.

ANGLE MEASUREMENT:

Resolution: 2^24 = 16,777,216 counts per rev
= 0.0013 arc-min
Accuracy: < +/- 0.75 arc-min electrical + sensor error
Size 10 sensor +/- 16 arc-min net
Size 15 sensor +/- 9 arc-min net
Size 21 sensor +/- 9 arc-min net
Electrical Noise: < 2^-17 Rev rms at full bandwidth
Bandwidth: > 2000 Hz at -3 dB
> 1000 Hz at -45° phase lag
Max Tracking Rate: > 50,000 RPM
Velocity Ripple: < 0.2% p-p electronics only
Size 10 sensor < 2.5% p-p net (AKM 1)
Size 15 sensor < 1.5% p-p net (AKM 2,3,4)
Velocity Noise: < 4 RPM rms at full bandwidth

DIGITAL COMMUNICATIONS:

Baud Rate: 2.5 MBaud
Signaling: RS-485 differential, 8 bit data with odd parity compatible with standard UARTs
Update Period: Once every 51.2 uSec new position sample
Error Detection: 5 bit CRC in addition to parity check
EEPROM Memory: Does a data dump when the unit powers up.

POWER SUPPLY:

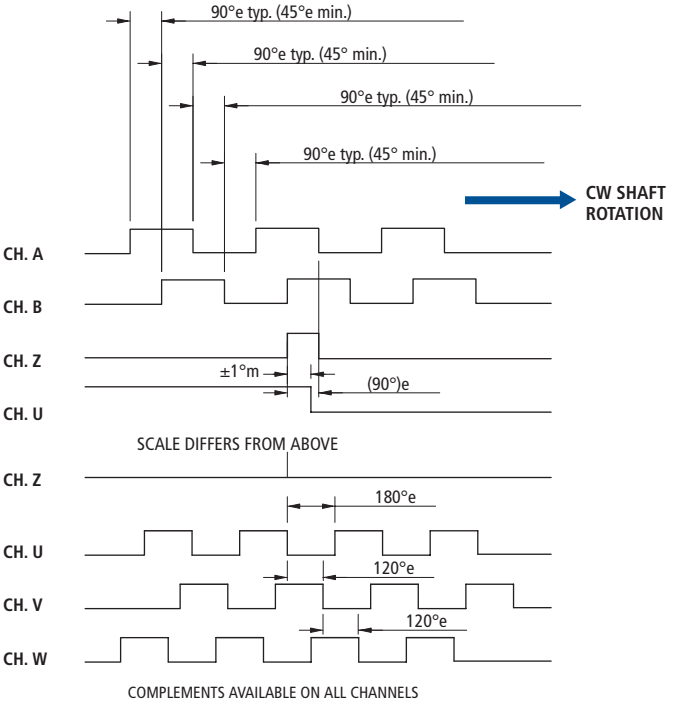
Supply at Drive: 5.0 V +/- 0.25V (+/-5%)
Supply at SFD in motor: 4.25V to 5.25V
Nominal Supply Current: 120 mA
Worst Case Supply: 150 mA
Cable Resistance: +5V, Rtn: < 3.3 Ohm net

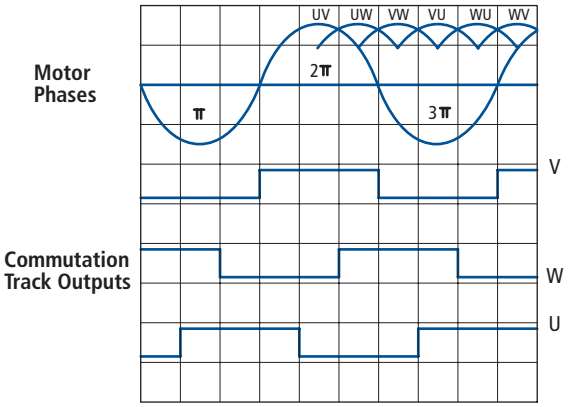
ENVIRONMENTAL:

Operating Ambient: -20 to 120° C
Humidity: 10% to 90% non-condensing
Storage Temperature: -40 to 135°C

AKM Series Motors with Commutating Encoder Option

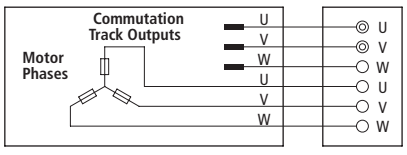
COMMUTATING ENCODER





Max. Misalignment between rising edge of commutation track V & zero crossing of back EMF UV <= 5° electrical.

Motor Connections



OUTPUT COMM: OPEN COLLECTOR W 2.2 k OHMS EXTERNAL PULL UPS (SINK 8 mA MAX.)

AKM Series Motors with Commutating Encoder Option (cont'd)

ENCODER DATA (TYPICAL PERFORMANCE DATA @ 25°C)

PARAMETER	UNITS	1-	2-	ED	EE	EF (AKM2-4)	EF (AKM5-7)	EG	EM	EH	EN (AKM5-7)	EJ (AKM5-7)
INPUT VOLTAGE	V DC ±10%	5										
OUTPUT DATA		26LS31 DIFF. LINE DRIVER. SINK/SOURCE 40mA MAX										
LINE COUNT		1024	2048	500	1000	2000	2000	2500	4096	5000	8192	10,000
FREQUENCY RESPONSE	KHz	300	300	250	250	500	250	500	500	500	500	500
MAX. SPEED	RPM	12,000	12,000	12,000	12,000	12,000	7,500	12,000	7,324	8,000	3,662	3,000
MIN. EDGE SEPARATION OF INCREMENTAL CHANNEL	°e MIN.	45										
INDEX TO U COMM CHANNEL		±1°m INDEX CENTER TO U RISING EDGE										
INDEX PULSE WIDTH		GATED WITH A HIGH AND B HIGH										
INCREMENTAL CHANNEL ACCURACY		±2.5 ARC MIN. MAX xxx TO ANY EDGE										
MAX. ACCELERATION	Rad/s^2	100,000										
OPERATING TEMPERATURE	°C	0-120										
STORAGE TEMPERATURE	°C	0-120	-40 - 120									

	TYPE	AKM 1	AKM 2	AKM 3	AKM 4	AKM 5,6,7
COMMUTATING CHANNEL	ALL	6 POLE 60°m ±6 MIN.	6 POLE 60°m ±6 MIN.	8 POLE 45°m ±6 MIN.	10 POLE 36°m ±6 MIN.	10 POLE 36°m ±6 MIN.
MOMENT OF INTERIA (kg-cm^2)	1-, 2-	1.6	2.5	2.5	2.5	18.8
	ALL EX	NA	0.0058	0.0058	0.0058	0.0373

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. It may be used for a limited number of emergency stop conditions, however such use will eventually cause wear, leading to eventual malfunction of the brake.

AKM Motor Brake Options

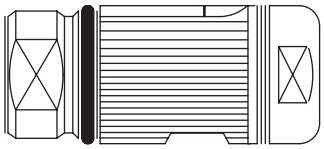
Motor Family	Minimum Static Torque @120° C		Weight		Power Consumption @24V, 20° C	Current @24V, 20° C	Inertia		Closing Time (engage)	Opening Time (release)	Backlash ③	
	N-m	lb-in	Kg	lbs	Watts +/- 7%	ADC	kgcm^2	lb-in-sec^2	msec	msec	Maximum deg.	Typical deg.
AKM2	1.42	12.6	0.27	0.59	8.4	0.35	0.011	0.97E-05	18	20	1.01	0.46
AKM3	2.5	22.1	0.35	0.77	10.1	0.42	0.011	0.97E-05	10	25	1.01	0.46
AKM4	6.0	53.1	0.63	1.39	12.8	0.53	0.068	6.02E-05	15	35	0.81	0.37
AKM5	14.5	128	1.1	2.42	19.5	0.82	0.173	1.53E-04	15	80	0.71	0.31
AKM6	25	221	2	4.4	25.7	1.07	0.605	5.35E-04	20	105	0.51	0.24
AKM7	53	469	2.9	6.38	35.6	1.48	1.644	1.46E-03	35	110	0.44	0.20

1. Contamination of the motor internal compartment by oil or other foriegn materials will result in failure of the brake. Check the suitability of motor sealing for the working environment.
2. Operating Voltage: 24 VDC +/- 10%.
3. Maximum backlash is calculated using worst-case tolerancing, and typical backlash is calculated using statistical tolerancing.

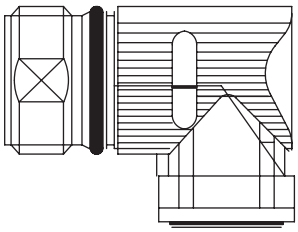
Sine Encoder

Option DA " = Single-Turn Absolute
Option "DB" = Multi-Turn Absolute

"C" Connector



CABLE OPTION
(AKM 2 ONLY)

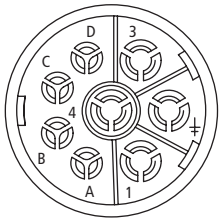


MOTOR MOUNTED OPTION
(AKM 3 , 4, 5 , 6, & 7 ONLY)

* NOTE: INTERCONTEC PART NUMBERS

"DA" & "DB" POWER CONNECTOR

(VIEW FACING FRONT)



CONNECTOR PART NUMBER
BKUA-199-NN-00-11-0035-000
(FOR AKM 2)
BEDC-089-NN-00-00-0005-000
(FOR AKM 3,4,5,6 & 7)

PIN	FUNCTION	COLOR
1	U	BLUE
⏚	PE	GRN/YEL
3	W	VIOLET
4	V	BROWN
A	BRAKE +	BLACK
B	BRAKE -	BLACK
C	N/C	
D	N/C	

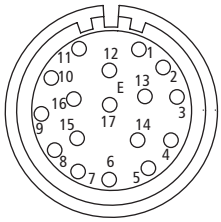
SHIELD CONNECTED TO MOTOR GROUND INTERNAL TO MOTOR
(For AKM2)

SUGGESTED MATING CONNECTOR
BSTA-108-NN-00-08-0036-000

If dimensionals are required for connectors, refer to catalog or contact Customer Service.

"DA" & "DB" ABSOLUTE ENCODER

(VIEW FACING FRONT)



CONNECTOR PART NUMBER
AKUA-034-NN-00-09-0035-000
(FOR AKM 2)
AEDC-113-NN-00-00-0012-000
(FOR AKM 3, 4, 5, 6 & 7)

PIN	FUNCTION	COLOR	
		AKM2	AKM3, 4, 5, 6, 7 (Motor-mounted connector)
1	B -	RED/BLK	RED/BLK
2	GND	WHT/GRN	WHT/GRN
3	A -	YEL/BLK	YEL/BLK
4	Vcc (5VDC)	BRN/GRN	BRN/GRN
5	DATA	GRAY	GRAY
6	N/C		
7	THERMAL SENSOR +	GREEN	BLUE
8	CLOCK	VIOLET	VIOLET
9	B +	BLU/BLK	BLU/BLK
10	Un SENSE (COMMON)	WHITE	WHITE
11	A +	GRN/BLK	GRN/BLK
12	Up SENSE (VCC)	BLUE	BLUE
13	$\overline{\text{DATA}}$	PINK	PINK
14	THERMAL SENSOR -	BROWN	BLACK
15	$\overline{\text{CLOCK}}$	YELLOW	YELLOW
16	N/C		
17	N/C		

SHIELD IS NOT CONNECTED
AT MOTOR END

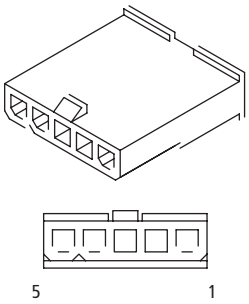
SUGGESTED MATING CONNECTOR
ASTA-035-NN-00-10-0035-000

"M" Connector with "D" Feedback Option

(AKM 2, 3, & 4 ONLY)

POWER CONNECTOR
(NON BRAKE)

(VIEW FACING FRONT)



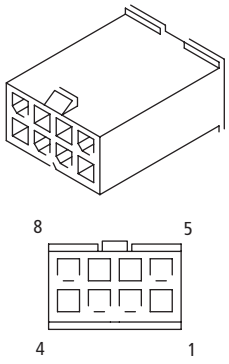
CONNECTOR PART NUMBER MOLEX 39-01-4056 (ENG NO. 5559-05P3)		
PIN	FUNCTION	COLOR
1	U	BLUE
2	V	BROWN
3	W	VIOLET
4	GND	GRN/YEL
5	SHIELD	

SHIELD CONNECTED TO MOTOR
GROUND INTERNAL TO MOTOR

SUGGESTED MATING CONNECTOR
MOLEX 39-01-4050

POWER CONNECTOR
(BRAKE)

(VIEW FACING FRONT)



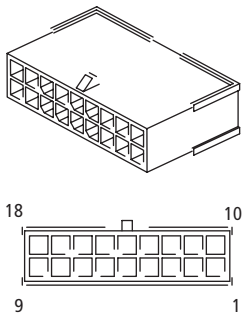
CONNECTOR PART NUMBER MOLEX 39-01-3083 (ENG NO. 5559-08P1)		
PIN	FUNCTION	COLOR
1	U	BLUE
2	V	BROWN
3	W	VIOLET
4	GND	GRN/YEL
5	SHIELD	
6	BRAKE +	BLACK
7	BRAKE -	BLACK
8	N/C	

SHIELD CONNECTED TO MOTOR
GROUND INTERNAL TO MOTOR

SUGGESTED MATING CONNECTOR
MOLEX 39-01-2080

"DA" & "DB" ABSOLUTE ENCODER

(VIEW FACING FRONT)



CONNECTOR PART NUMBER MOLEX 43020-1801		
PIN	FUNCTION	COLOR
1	B -	RED/BLK
2	GND	WHT/GRN
3	A -	YEL/BLK
4	Vcc (5VDC)	BRN/GRN
5	DATA	GRAY
6	N/C	
7	THERMAL SENSOR +	GREEN
8	CLOCK	VIOLET
9	B +	BLU/BLK
10	Un SENSE (COMMON)	WHITE
11	A +	GRN/BLK
12	Up SENSE (VCC)	BLUE
13	$\overline{\text{DATA}}$	PINK
14	THERMAL SENSOR -	BROWN
15	$\overline{\text{CLOCK}}$	YELLOW
16	N/C	
17	N/C	
18	SHIELD	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
MOLEX 43025-1800

If dimensionals are required for connectors, refer to catalog or contact Customer Service.

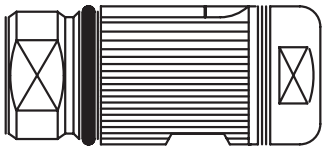
AKM Series Motors with Absolute Sine Encoder Option

TYPE		SINGLE-TURN "DA"		MULTI-TURN "DB"	
FRAME SIZE		AKM 2, 3, 4	AKM5, 6, 7	AKM2, 3, 4	AKM5, 6, 7
PULSES PER REVOLUTION		512	2048	512	2048
INPUT VOLTAGE	VDC ±5°	5	5	5	5
CURRENT CONSUMPTION	mA MAX.	160	150	200	250
OPERATING TEMPERATURE	°C	-40/155	-30/115	-40/115	-30/115
INERTIA	kg cm^2	0.040	0.260	0.040	0.260
OUTPUT INTERFACE		HEIDENHAIN EnDat			
TYPE		ECN1113	ECN1313	EQN1125	EQN1325

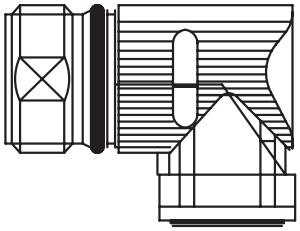
Encoder Alignment

With positive DC current into phase W and out of phase V (U floats) the encoder is aligned to ±1 electrical degree.

"C" Connector Options



CABLE OPTION
(AKM 1 & 2 ONLY)



MOTOR MOUNTED OPTION
(AKM 3 , 4, 5 , 6, & 7 ONLY)

POWER CONNECTOR

(VIEW FACING FRONT)

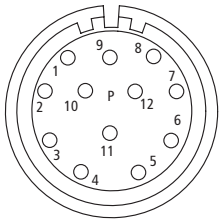
CONNECTOR PART NUMBER BKUA-199-NN-00-11-0035-000 (FOR AKM 1 & 2) BEDC-089-NN-00-00-0005-000 (FOR AKM 3,4,5,6 & 7)		
PIN	FUNCTION	COLOR
1	U	BLUE
⏚	PE	GRN/YEL
3	W	VIOLET
4	V	BROWN
A	BRAKE +	BLACK
B	BRAKE -	BLACK
C	N/C	
D	N/C	

SHIELD CONNECTED TO MOTOR
GROUND INTERNAL TO MOTOR
(For AKM1 and 2)

SUGGESTED MATING CONNECTOR
Intercontec BSTA-108-NN-00-08-0036-000

SFD FEEDBACK

(VIEW FACING FRONT)



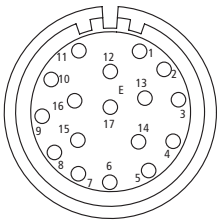
CONNECTOR PART NUMBER AKUA-020-NN-00-09-0035-000 (FOR AKM 1 & 2) AEDC-052-NN-00-00-0012-000 (FOR AKM 3 & 4)		
PIN	FUNCTION	COLOR
1	SFD +5V	RED
2	SFD +5V RTN	BLACK
3	SFD COM-	YELLOW
4	SFD COM+	BLUE
5	SFD COM SHIELD (AKM 1,2)	
6	N/C	
7	N/C	
8	N/C	
9	N/C	
10	N/C	
11	N/C	
12	N/C	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
Intercontec ASTA-021-NN-00-10-0035-000

COMMUTATING ENCODER

(VIEW FACING FRONT)



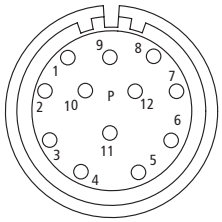
CONNECTOR PART NUMBER AKUA-034-NN-00-09-0035-000 (FOR AKM 1 & 2) AEDC-113-NN-00-00-0012-000 (FOR AKM 3,4,5,6 &7)		
PIN	FUNCTION	COLOR
1	B	GREEN
2	$\overline{B}$	GRN/BLK
3	A	BLUE
4	$\overline{A}$	BLUE/BLK
5	Z	VIOLET
6	$\overline{Z}$	VIOLET/BLK
7	GND	BLACK
8	THERMAL SENSOR	BLUE
9	THERMAL SENSOR	BLACK
10	Vcc	RED
11	N/C	
12	$\overline{U}$ (Optional)	
13	$\overline{V}$ (Optional)	
14	$\overline{W}$ (Optional)	
15	U	BROWN
16	V	GREY
17	W	WHITE

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
Intercontec ASTA-035-NN-00-10-0035-000

RESOLVER

(VIEW FACING FRONT)



CONNECTOR PART NUMBER AKUA-020-NN-00-09-0035-000 (FOR AKM 1 & 2) AEDC-052-NN-00-00-0012-000 (FOR AKM 3,4,5,6 &7)		
PIN	FUNCTION	COLOR
1	N/C	
2	THERMAL SENSOR	BLUE
3	S4 , COS-	BLUE
4	S3 , SIN-	BLACK
5	R2 , REF-	BLK/WHT
6	THERMAL SENSOR	BLACK
7	S2 , COS+	YELLOW
8	S1 , SIN+	RED
9	R1 , REF+	RED/WHT
10	N/C	
11	N/C	
12	N/C	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
Intercontec ASTA-021-NN-00-10-0035-000

If dimensionals are required
for connectors, refer to catalog
or contact Customer Service.

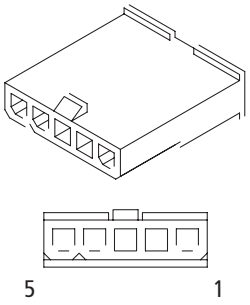
"M" Connector Options

(AKM 1 , 2, 3, & 4 ONLY)

POWER CONNECTOR

(NON BRAKE)

(VIEW FACING FRONT)



CONNECTOR PART NUMBER MOLEX 39-01-4056 (ENG NO. 5559-05P3)		
PIN	FUNCTION	COLOR
1	U	BLUE
2	V	BROWN
3	W	VIOLET
4	GND	GRN/YEL
5	SHIELD	

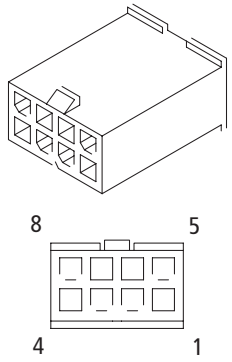
SHIELD CONNECTED TO MOTOR
GROUND INTERNAL TO MOTOR

SUGGESTED MATING CONNECTOR
MOLEX 39-01-4050

POWER CONNECTOR

(BRAKE)

(VIEW FACING FRONT)



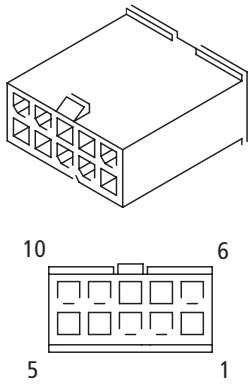
CONNECTOR PART NUMBER MOLEX 39-01-3083 (ENG NO. 5559-08P1)		
PIN	FUNCTION	COLOR
1	U	BLUE
2	V	BROWN
3	W	VIOLET
4	GND	GRN/YEL
5	SHIELD	
6	BRAKE +	BLACK
7	BRAKE -	BLACK
8	N/C	

SHIELD CONNECTED TO MOTOR
GROUND INTERNAL TO MOTOR

SUGGESTED MATING CONNECTOR
MOLEX 39-01-2080

SFD

(VIEW FACING FRONT)



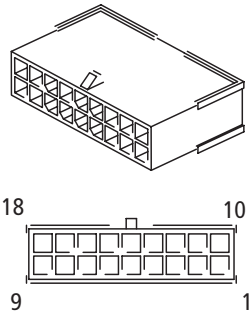
CONNECTOR PART NUMBER MOLEX 43020-1001		
PIN	FUNCTION	COLOR
1	SFD +5V	RED
2	SFD +5V RTN	BLACK
3	SFD COM-	YELLOW
4	SFD COM+	BLUE
5	SFD COM SHIELD	
6	N/C	
7	N/C	
8	N/C	
9	N/C	
10	N/C	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
MOLEX 43025-1000

COMMUTATING ENCODER

(VIEW FACING FRONT)



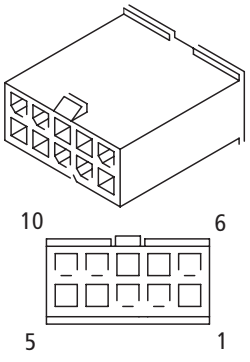
CONNECTOR PART NUMBER MOLEX 43020-1801		
PIN	FUNCTION	COLOR
1	B	GREEN
2	$\overline{B}$	GRN/BLK
3	A	BLUE
4	$\overline{A}$	BLUE/BLK
5	Z	VIOLET
6	$\overline{Z}$	VIOLET/BLK
7	GND	BLACK
8	THERMAL SENSOR	BLUE
9	THERMAL SENSOR	BLACK
10	Vcc	RED
11	N/C	
12	$\overline{U}$ (Optional)	
13	$\overline{V}$ (Optional)	
14	$\overline{W}$ (Optional)	
15	U	BROWN
16	V	GREY
17	W	WHITE
18	SHIELD	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
MOLEX 43025-1800

RESOLVER

(VIEW FACING FRONT)



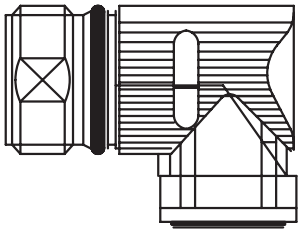
CONNECTOR PART NUMBER MOLEX 43020-1001		
PIN	FUNCTION	COLOR
1	N/C	
2	THERMAL SENSOR	BLUE
3	S4 , COS-	BLUE
4	S3 , SIN-	BLACK
5	R2 , REF-	BLK/WHT
6	THERMAL SENSOR	BLACK
7	S2 , COS+	YELLOW
8	S1 , SIN+	RED
9	R1 , REF+	RED/WHT
10	SHIELD	

SHIELD IS NOT CONNECTED
AT MOTOR END

SUGGESTED MATING CONNECTOR
MOLEX 43025-1000

If dimensionals are required for connectors,
refer to catalog or contact Customer Service.

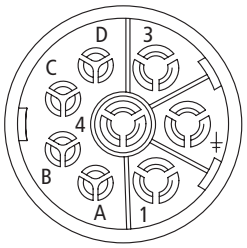
"D" Connector Options



MOTOR MOUNTED OPTION
(AKM 3 & 4 ONLY)

COMBINED POWER & SFD FEEDBACK

(VIEW FACING FRONT)



CONNECTOR PART NUMBER BEDC-089-NN-00-00-0005-000		
PIN	FUNCTION	COLOR
1	U	BLUE
⏚	PE	GRN/YEL
3	W	VIOLET
4	V	BROWN
A	SFD +5V	RED
B	SFD +5V RTN	BLACK
C	SFD COM-	YELLOW
D	SFD COM+	BLUE

SUGGESTED MATING CONNECTOR
Intercontec BSTA-108-NN-00-08-0036-000

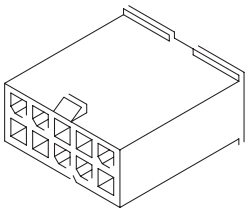
"P" Connector Options

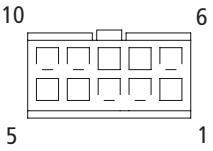
(AKM 1, 2, 3, & 4 ONLY)

COMBINED POWER & SFD FEEDBACK

(NOT AVAILABLE FOR BRAKE MOTORS)

(VIEW FACING FRONT)





CONNECTOR PART NUMBER MOLEX 39-01-3103 (ENG NO. 5559-10P1)		
PIN	FUNCTION	COLOR
1	SFD +5V	RED
2	SFD +5V RTN	BLACK
3	POWER SHIELD	
4	GROUND	GRN/YEL
5	U	BLUE
6	SFD COM-	YELLOW
7	SFD COM+	BLUE
8	SFD COM SHIELD	
9	V	BROWN
10	W	VIOLET

POWER SHIELD CONNECTED TO
MOTOR GROUND INTERNAL TO MOTOR

FEEDBACK SHIELD IS NOT
CONNECTED AT MOTOR END

SUGGESTED MATING CONNECTOR
MOLEX 39-01-2100

If dimensionals are required for connectors,
Refer to catalog or contact Customer Service.

MATING CONNECTOR KITS

(FOR USE ON MOTORS WITH "C" CONNECTORS ONLY)

FEEDBACK TYPE	CK AMPS	K-E1 AMPS
RESOLVER	CKT-T1A-SRE	CKT-T1B-SRE
ENCODER	CKT-T1A-SCE	CKT-T1B-SCE

MATING CONNECTOR KITS INCLUDE BOTH POWER AND FEEDBACK CABLES.

AKM Series Brushless Servomotors

AKM 4 2 E - EK C N R - 00

AKM Series

Motor Frame Size
1, 2, 3, 4, 5, 6, 7

Rotor Stack Length
1, 2, 3, 4, 5

Winding Type
A, B, C, D, etc.
S = Special

Mount
A = International standard mount
B = NEMA mount
C = Alternative standard mount
D = Alternative standard mount
E = NEMA mount
S = Special

Shaft
C = Closed keyway
K = Open keyway
N = Smooth shaft
S = Special

See pages 16-29 for details on mount / shaft option codes and availability.

Connectors
C = 0.5 meter shielded cables w/ IP65 connectors (AKM1, 2)
= Motor-mounted rotatable IP65 connectors (AKM3, 4, 5, 6, 7)
D = Single motor-mounted rotatable IP65 connector
(AKM3, 4 models with SFD and no brake)
M = 0.5 meter shielded cables w/ IP20 plugs
(AKM1, 2, 3, 4 models less than 6 amps)
P = 0.5 meter shielded cables w/ single IP20 plug
(AKM1, 2, 3, 4 models with SFD and no brake, less than 6 amps)
S = Special

Brake
2 = 24 VDC brake (AKM2, 3, 4, 5, 6, 7 models)
N = No brake
S = Special

Feedback Device
1 - = 1024 PPR digital encoder w/ commutation
2 - = 2048 PPR digital encoder w/ commutation
C - = Smart feedback device (SFD)
(AKM1, 2, 3, 4 models only)
R - = Resolver
DA = Single-turn Absolute Sine Encoder
DB = Multi-turn Absolute Sine Encoder
ED = 500 PPR digital encoder w/ commutation
EE = 1000 PPR digital encoder w/ commutation
EF = 2000 PPR digital encoder w/ commutation
EG = 2500 PPR digital encoder w/ commutation
EM = 4096 PPR digital encoder w/ commutation
EH = 5000 PPR digital encoder w/ commutation
EN = 8192 PPR digital encoder w/ commutation
(AKM5, 6, 7 models only)
EJ = 10,000 PPR digital encoder w/ commutation
(AKM5, 6, 7 models only)

Customization / Seal
00 = Standard motor w/o shaft seal
01 = Standard motor w/ shaft seal
Other #'s will be assigned for special motors.

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FOR IMMEDIATE ASSISTANCE:

Internet: www.DanaherMotion.com

In USA, Canada or Mexico:
Phone: 1-540-633-3400
Fax: 1-540-639-4162
E-mail: DMAC@danahermotion.com
Literature: litrequest@danahermotion.com
or write:
Danaher Motion
203A West Rock Road
Radford, VA 24141 USA

In UK:
Phone: 0800 975 1000
Sales Fax: 0800 975 1001
E-mail: LMSEurope@danahermotion.com
or write:
Danaher Linear Motion Systems
Fishleigh Road, Roundswell Business Park
Barnstaple
EX31 3UD UK

Catalogue request: catalogues@danahermotion.com

In Europe:
Phone: +46 (0) 44 24 67 00
Fax: +46 (0) 44 24 40 85
E-mail: helpdesk@tollo.com
or write:
Danaher Motion
Tollo Linear AB
Box 9053
SE-291 09 Kristianstad Sweden

or
Phone: +49 (0) 70 22 504-0
Fax: +49 (0) 70 22 541-68
or write:
Danaher Linear GmbH
Nürtinger Strasse 70
D-72649 Wolfschlugen Germany

Elsewhere:
Phone: 1 (516) 883-8937
Fax: 1 (516) 883-7109