

# AKM<sup>®</sup> Servo Motor Selection Guide



with AKD<sup>®</sup> Servo Drive Systems

**KOLLMORGEN**<sup>®</sup>

*Because Motion Matters™*

# Kollmorgen: Your partner. In Motion.

Every solution comes from a real understanding of the challenges facing machine designers and users.

**Innovators consistently rate Kollmorgen as one of their best motion systems manufacturing partners.** Whether you are looking for classic servo motors, direct-drive servo motors, stepper motors, drives & amplifiers, gearing, actuation, or CNC & multi-axis motion controllers, Kollmorgen is one of the few companies in the world who actually designs and manufactures all of these products.

**Our customers are leaders** in many industries such as Aerospace & Defense, Printing, Packaging & Converting, Food & Beverage Processing, Medical Imaging, In Vitro Diagnostics & Laboratory Automation, Pharmaceutical Manufacturing, Material Forming and Cutting, Oil & Gas, and Robotics. Kollmorgen is also a leader in Warehouse Automation, including complete AGV systems, software, awareness and autonomy.

**Our Automation Solutions** can be found on Mars and in space, ships and submarines, O&G drilling and metrology, surgical robots and laser eye surgery, even inside artificial hearts. These are just a few applications that demand high-performance and high-quality while satisfying their specific needs.

**Because motion matters, it's our focus:** Motion can distinctly differentiate a machine and deliver a marketplace advantage by increasing its performance and dramatically improving overall equipment effectiveness (OEE).

High-performance motion can make your customer's machine more reliable and energy-efficient, enhance accuracy and improve operator safety. Motion also represents endless possibilities for innovation.

We've always understood this potential, and thus have kept motion at our core and in our Vision, Mission & Values, relentlessly developing products that offer precise control of torque, velocity and position accuracy in machines that rely on complex motion.

**Removing the Barriers of Design, Sourcing, and Time**

At Kollmorgen, we know that OEM engineers can achieve a lot more when obstacles aren't in the way. So, we clear obstacles in three important ways:

**Integrating Standard and Custom Products**

The optimal solution is often not clear-cut. Our application expertise allows us to modify standard products or develop totally custom solutions across our whole product portfolio so that designs can take flight.

**Providing Motion Solutions, Not Just Components**

As companies reduce their supplier base and have less engineering manpower, they need a total system supplier with a wide range of integrated solutions. Kollmorgen offers complete solutions as well as motion subsystems that combine programming software, engineering services and best-in-class motion components.

**Global Footprint**

With direct sales, engineering support, manufacturing facilities, and distributors spanning the Americas, Europe, Middle East, and Asia, we're close to OEMs worldwide. Our proximity helps speed delivery and lend support where and when they're needed.

**Financial and Operational Stability**

Kollmorgen is part of Fortive. A key driver in the growth of all Fortive divisions is the Fortive Business System, which relies on the principle of "kaizen" – or continuous improvement. Using world-class tools, cross-disciplinary teams of exceptional people evaluate processes and develop plans that result in superior performance.

Kollmorgen: Your partner. In Motion.

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# ▶ AKM<sup>®</sup> Servo Motor

**Kollmorgen's AKM family of servo motors gives you unprecedented choice and flexibility from a wide range of standard products so you can select the best servo motor for your application.** By pairing AKM servo motors with our family of plug-and-play AKD<sup>®</sup> servo drives, selecting the right motion control products has never been easier. Pick from thousands of servo motor/servo drive combinations outlined in this selection guide or go to our website to find the best solution for your application.

**Standard AKM servo motors and AKD servo 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 team to customize a solution for your machine design. Either way, standard product or customized, we can help you choose the motion control solution that meets your exact requirements.



## The Benefits of AKM® Servo Motor

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- Best-in-Class Performance
  - Industry-leading motor power density
  - Same size AKM/AKD system delivers up to 47% more shaft power
  - Compensation for stiff and compliant transmissions and couplings
  - Exceptionally low cogging
- Flexibility to Find an Exact-fit Solution in a Standard Product
  - AKM offers 28 frame-stack combinations and 120 standard windings in a single motor line
  - 4.8 million possible AKM part number combinations and growing
  - Simplifies or eliminates mechanical modifications and engineering adaptation
  - Available with single cable technology with digital feedback (Digital Resolver SFD3 or HIPERFACE® DSL)
  - Washdown and Food Grade options for AKM
  - Higher torque models up to 180 Nm of continuous torque
- Ease-of-Use and Faster Commissioning
  - Plug-and-play motor recognition drive commissioning
  - Reduce cycle time and sensor-and-wiring costs by eliminating traditional homing methods
  - Reduction in set-up time for each servo system

# AKM<sup>®</sup> Servo Motor Series

## AKM Motors Offer Extremely High Torque Density and High Acceleration

The 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:

- 8 frame sizes (40 to 260 mm)
- 28 frame-stack length combinations
- More than 120 standard windings



### Features

#### Torque

0.16 to 180 Nm continuous stall torque (1.4 to 1590 lb-in) in 28 frame/stack combinations. Specific torques are often available from multiple frame sizes to optimize mounting and inertia matching capabilities.

#### Speed

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

#### Voltage

AKM motors can be applied to all standard global voltages. Windings are specifically tailored to work with drives powered by 75 Vdc, 120, 240, 400 or 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

Rotatable IP65 connectors, straight IP67 connectors or 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 and DSL only).

#### Thermal

Windings are rated conservatively at 100°C rise over a 40°C ambient while using 155°C (class F) insulation materials. Motors meet applicable UL, CSA, and CE requirements and include thermistors.

#### Additional Options:

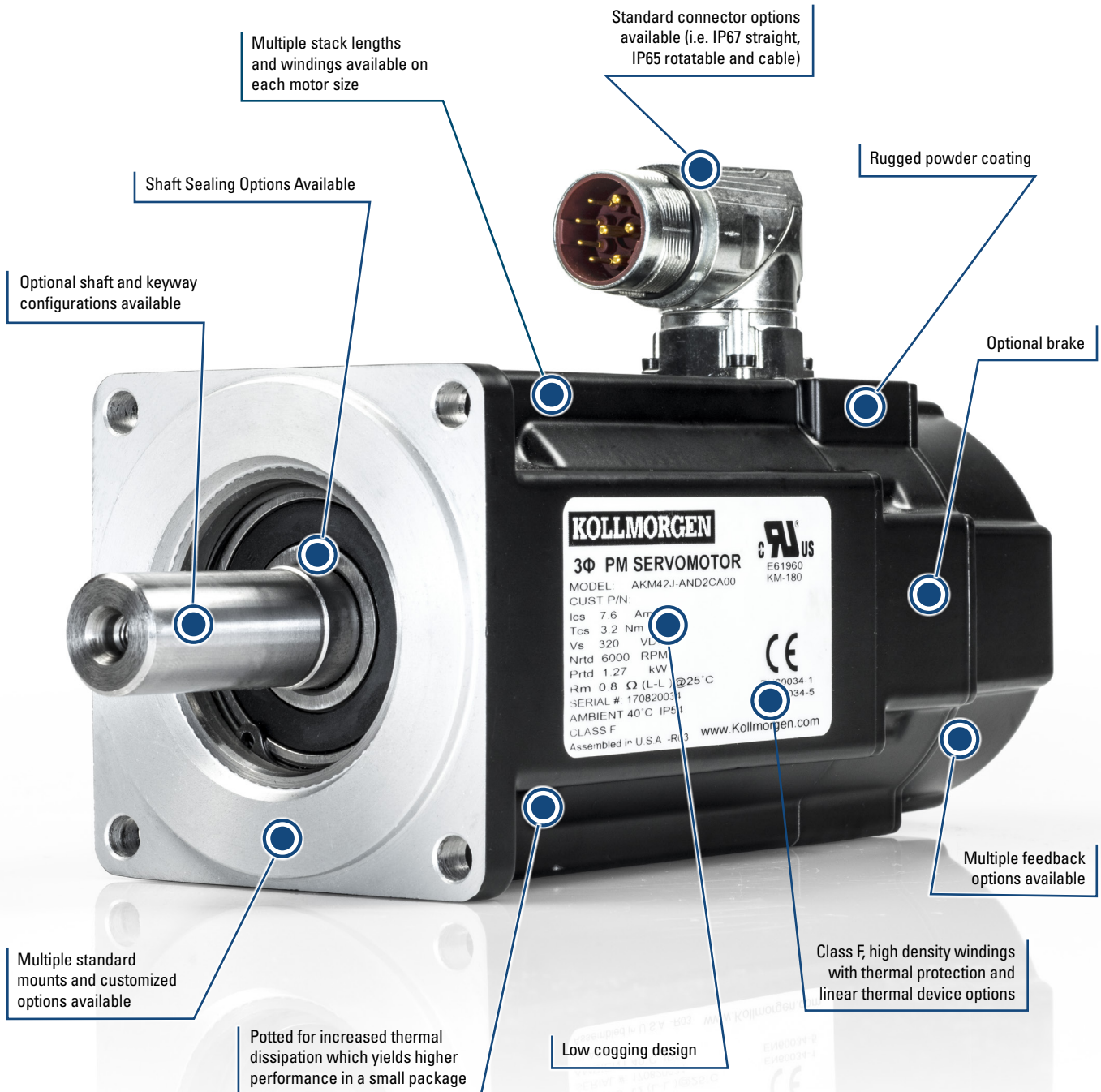
- Holding Brakes
- Shaft and mounting variations
- Shaft sealing options available
- Custom windings
- Feedback devices
- Connectivity

## Kollmorgen Cables Offer the Complete Solution



Kollmorgen offers complete cable solutions for connecting drives and motors. This includes static, low cost cable sets for simple applications to high bend, high flex, hybrid cables that combine feedback and power in one cable. Not sure which cable offering would best suit your needs? No problem. Kollmorgen Customer Support is available to discuss cable options and what makes the most sense for your machine.

## Kollmorgen AKM Configurable Servo Motor Features



**KOLLMORGEN**  
**3Φ PM SERVOMOTOR**  
 MODEL: AKM42J-AND2CA00  
 CUST P/N  
 Ics 7.6 Arm  
 Tcs 3.2 Nm  
 Vs 320 VDC  
 Nrtd 6000 RPM  
 Prtd 1.27 kW  
 Rm 0.8 Ω (L-L) @25°C  
 SERIAL # 170820031  
 AMBIENT 40°C IP54  
 CLASS F  
 Assembled in U.S.A. - R3  
 www.Kollmorgen.com

**UL**  
 E61960  
 KM-180

**CE**  
 EN60034-1  
 EN60034-5



# AKM<sup>®</sup> World of Options

This selection guide outlines examples of the many options available within the family of advanced AKM servo motors. Don't see the configuration that you are looking for? We have the design capacity and manufacturing expertise to create modified standards to better fit your application. Ask our Customer Support Center today about a modified standard or custom solution that fits your needs.

Our motors are complimented by a complete family of digital servo drives, offering you the best motion control solution in the marketplace. Let the experts at Kollmorgen put a world of solutions at your fingertips.



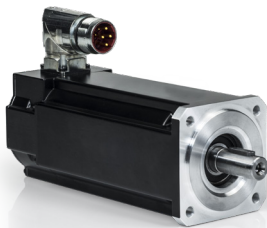
## AKM11x

The smallest AKM by both stack and length with "M" option connectivity and Smart Feedback Device (SFD)



## AKM21x

The AKM2 frame size with "D" motor-mounted rotatable single connector, Commutating Encoder and optional holding brake.



## AKM33x

The AKM3 frame size with "D" motor-mounted rotatable single connector and SFD feedback.



## AKM42x

The AKM4 frame size with "D" motor-mounted rotatable single connector and SFD feedback.



## AKM51x

The AKM5 frame size with "C" motor-mounted rotatable double connectors and optional holding brake.



## AKM65x

The AKM6 frame size with "C" motor-mounted rotatable double connectors and optional holding brake.



## AKM74x

The longest in the AKM7 frame size with "C" option connectivity and holding brake



## AKM83x

The largest AKM by both frame and length with "T" Terminal Box and SFD Feedback.



# AKM<sup>®</sup> Washdown and Food Grade

These motor variants are used in applications that are subject to strict hygiene regulations in which it is essential that the formation of nuclei and corrosion are avoided and in which machines must be cleaned cyclically. These motors are based on the standard types AKM2 – AKM6 with special modifications for use in the food-processing industry, in the packaging industry, or even outdoors. An option for AKM Washdown and Washdown Food motors is to coat the flange.

## AKM Washdown

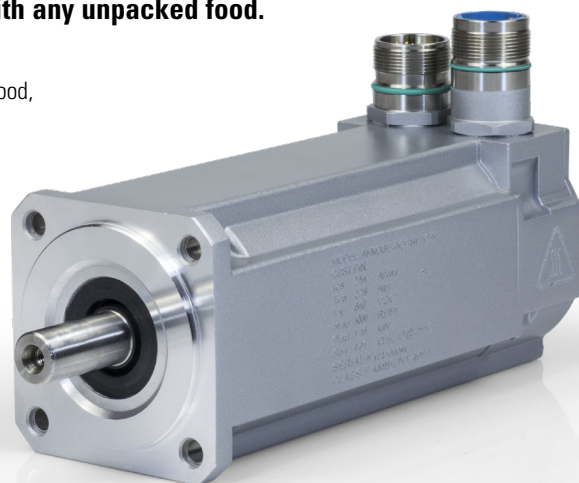
### Part Numbers:

AKMxxx-xxxx-0W: Washdown with unpainted flange

AKMxxx-Wxxxx-0W: Washdown with painted flange

**Note: The AKM Washdown motors must not come into contact with any unpacked food.**

Application Area:	Harsh Environments, Outdoors
Application Examples:	Transport in the food and packaging area without contact with food, radar stations, and wind turbines
Standards:	UL, CE, RoHS
Surface:	Gray 2K paint
Immunity:	Against tested industrial cleaning agents*, corrosion-resistant
Degree of Protection:	IP67
Shaft:	303 Stainless steel (CSN417029)
Rotary Shaft Seal:	PTFE
Lubricant:	Industrial bearing grease, non-food-grade
Connector:	Stainless steel, smooth surface
Screws:	Stainless steel
Name Plate:	Engraved, additional name plate in the package



## AKM Washdown Food Grade

### Part Numbers:

AKMxxx-xxxx-0F: Washdown with unpainted flange

AKMxxx-Wxxxx-0F: Washdown with painted flange

**Note: The surface of the washdown food motor has passed all tests as per FDA Global Migration for indirect contact with food. Any direct contact with unpacked food is not permitted.**

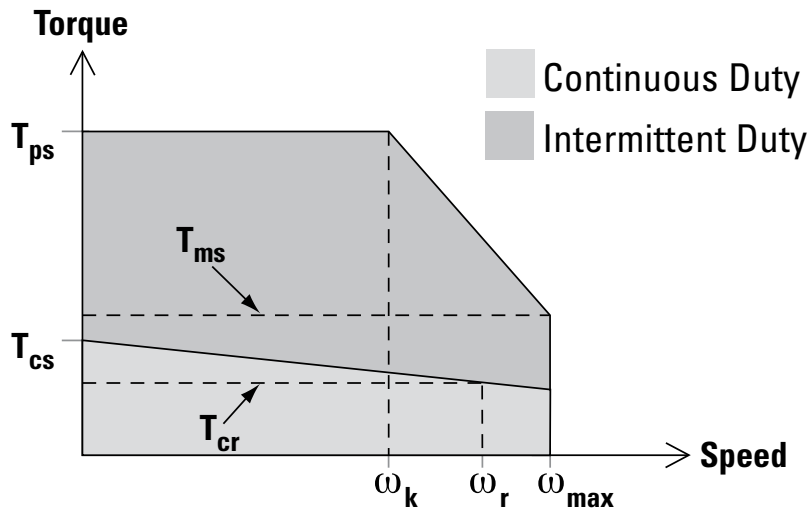
Application Examples:	Food and beverages industries; cutting, packing, and filling without direct contact with food; motor positioned laterally or below the food.
Standards:	UL, CE, RoHS, FDA
Surface:	White 2K FDA compliant paint**
Immunity:	Against tested industrial cleaning agents*, corrosion-resistant
Degree of Protection:	IP67
Shaft:	303 Stainless steel (CSN417029)
Rotary Shaft Seal:	PTFE as per FDA
Lubricant:	Food grade as per FDA
Connector:	Stainless steel, smooth surface
Screws:	Stainless steel
Name Plate:	Engraved, additional name plate in the package



\* Resistance of the AKM Washdown and AKM Washdown Food Grade surfaces to the following industrial cleaning agents has been tested: P3-topactive DES, P3-topactive LA, P3-topax56, P3-topax 66, P3-topax 91

\*\*Meets FDA global migration standards

# AKM<sup>®</sup> Systems Overview



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)
$\omega_{max}$	- Maximum speed
$\omega_r$	- Rated speed (speed at rated power)
$\omega_k$	- Speed at knee in peak envelope (intersection of system peak torque with voltage limit line)

## How to Build a Servo Drive and Motor System

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

## Drive and Motor Performance Curves

The performance characteristics of a brushless servo system (motor/drives 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 drives' rated continuous current output, whichever is less. The system voltage line is set by the voltage rating of the drives, 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.

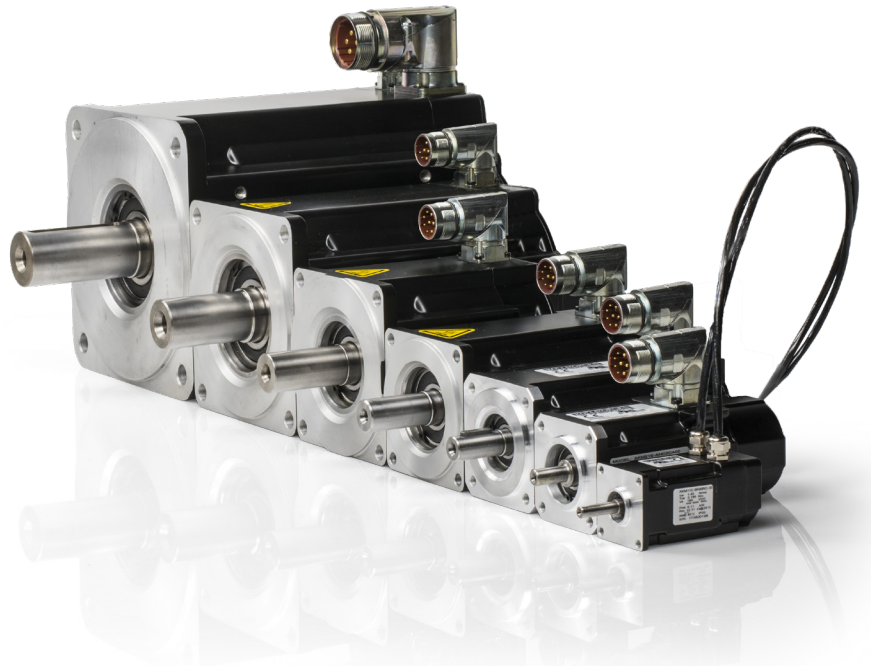
### Intermittent Duty Zone

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 drives' peak current rating, which the drive 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 Kollmorgen Customer Support for more details. The system voltage line is set by the voltage rating of the drive, 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.



The AKM® brushless servo motor stands alone in the marketplace in terms of flexibility and performance advantages. Kollmorgen's culture of continuous improvement has paid dividends again. The AKM servo motor's innovative design has been polished and optimized. With the new AKD® amplifier, the venerable AKM servo motor sets a new standard of refined servo performance, designed to deliver precise motion and more power for your money. Nowhere else will you find a more versatile and complete servo family to meet your needs and exceed your expectations.



### Features

- Eight frame sizes (40 to 260 mm)
- 28 frame-stack length combinations
- 120 standard windings for 120/240/400/480 Vac operation as well as low-voltage DC options
- Flexible flange mount and shaft options
- Exceptionally low cogging and low harmonic distortion to ensure smooth performance
- Wide range of feedback options for high performance and precision or rugged environments
- Unmatched customization – special windings, special shafts, and much more

### AKD with AKM Plug-and-Play Feedback

These feedback devices include electronic motor nameplates allowing plug-and-play commissioning, eliminating the need for drive parameter set-up and servo loop tuning in most applications.

### Performance Data

	AKM Motor	Single-turn Absolute			Multi-turn Absolute		
		Accuracy (arc-min)	Resolution (bits)	Feedback Type	Accuracy (arc-min)	Resolution (bits)	Feedback Type
Value Line	AKM1	16	24	C	–	–	–
	AKM2-3	9	24	C	8	20	LB
	AKM4-8	9	24	C	4.66	21	LB
Performance Line	AKM2-4	1.0	27	DA	1.0	27	DB
	AKM5-8	0.333	27	DA	0.333	27	DB

Note: Additional plug-and-play feedback options covered in the feedback devices section on page 53.

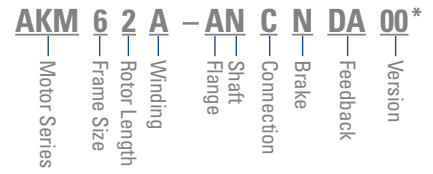
# AKM<sup>®</sup> Systems Overview

AKM<sup>®</sup> SYSTEMS OVERVIEW

## AKM Servo Motor with AKD Servo Drive System Performance

AKM Servo Motor	AKD Servo Drive	Frame Size NEMA/mm	Cont.Torque at stall Tcs Nm (lb-in)	Peak Torque at stall Tps Nm (lb-in)	Rated Speed Nrt'd RPM	Max System Speed <sup>2</sup> RPM	Power Prtd watts	Inertia (Jm) Kg-cm <sup>2</sup> (lb-in-s <sup>2</sup> x10 <sup>-2</sup> )	
120 Vac	AKM11B	AKD-X00306	17/40	0.18 (1.59)	0.61 (5.4)	4000	8000	80	0.017 (0.0015)
	AKM11C	AKD-X00306	17/40	0.19 (1.68)	0.62 (5.5)	6000	8000	110	0.017 (0.0015)
	AKM12C	AKD-X00306	17/40	0.31 (2.74)	1.08 (9.56)	4000	8000	130	0.031 (0.00274)
	AKM12E	AKD-X00306	17/40	0.31 (2.74)	0.91 (8.05)	8000	8000	230	0.031 (0.00274)
	AKM13C	AKD-X00306	17/40	0.41 (3.63)	1.46 (12.9)	3000	6150	130	0.045 (0.0040)
	AKM13D	AKD-X00306	17/40	0.40 (3.54)	1.36 (12.0)	7000	8000	270	0.045 (0.0040)
	AKM21C	AKD-X00306	23/60	0.48 (4.25)	1.48 (13.1)	2500	5620	120	0.107 (0.0095)
	AKM21E	AKD-X00306	23/60	0.47 (4.16)	1.21 (10.7)	7000	8000	300	0.107 (0.0095)
	AKM22C	AKD-X00306	23/60	0.84 (7.43)	2.39 (21.2)	1000	2820	90	0.161 (0.0142)
	AKM22E	AKD-X00306	23/60	0.87 (7.70)	2.42 (21.4)	3500	5410	290	0.161 (0.0142)
	AKM23D	AKD-X00306	23/60	1.15 (10.2)	3.89 (34.4)	1500	3270	180	0.216 (0.0191)
	AKM23F	AKD-X00606	23/60	1.18 (10.4)	3.88 (34.3)	4500	6290	500	0.216 (0.0191)
	AKM24D	AKD-X00306	23/60	1.40 (12.4)	4.84 (42.8)	1500	2700	210	0.270 (0.0239)
	AKM24F	AKD-X00606	23/60	1.41 (12.5)	4.82 (42.7)	3000	4720	420	0.270 (0.0239)
	AKM31E	AKD-X00306	na/80	1.20 (10.6)	3.23 (28.6)	2500	4240	310	0.330 (0.0292)
	AKM32E	AKD-X00306	na/80	2.04 (18.1)	5.97 (52.8)	1000	2350	210	0.590 (0.0522)
	AKM32H	AKD-X00606	na/80	2.10 (18.6)	6.22 (55.1)	3000	4460	620	0.590 (0.0522)
	AKM33H	AKD-X00606	na/80	2.87 (25.4)	8.55 (75.7)	2500	3310	690	0.850 (0.0752)
	AKM41E	AKD-X00306	34/90	2.01 (17.8)	5.33 (47.2)	1200	2420	240	0.810 (0.0717)
	AKM41H	AKD-X00606	34/90	2.05 (18.1)	5.49 (48.6)	3000	4460	580	0.810 (0.0717)
AKM43H	AKD-X00606	34/90	4.82 (42.7)	14.0 (124)	1200	1920	560	2.09 (0.185)	
AKM43L	AKD-X01206	34/90	4.73 (41.9)	11.7 (104)	3000	4020	1190	2.09 (0.185)	
AKM44H	AKD-X00606	34/90	5.89 (43.3)	17.0 (150)	1000	1620	570	2.73 (0.242)	
AKM51H	AKD-X00606	42/115	4.79 (42.4)	11.7 (104)	1200	2150	560	3.42 (0.303)	
AKM51L	AKD-X01206	42/115	4.89 (43.3)	10.6 (93.8)	3000	4150	1240	3.42 (0.303)	
AKM52L	AKD-X01206	42/115	8.67 (76.7)	19.6 (173)	1500	2290	1240	6.22 (0.551)	
AKM53L	AKD-X01206	42/115	11.6 (103)	26.5 (235)	1200	1740	1350	9.12 (0.807)	
AKM54L	AKD-X01206	42/115	13.5 (119)	31.3 (277)	1200	1510	1630	11.9 (1.06)	
240 Vac	AKM11B	AKD-X00306	17/40	0.18 (1.59)	0.61 (5.4)	8000	8000	140	0.017 (0.0015)
	AKM12C	AKD-X00306	17/40	0.31 (2.74)	1.08 (9.56)	8000	8000	230	0.031 (0.00274)
	AKM13C	AKD-X00306	17/40	0.41 (3.63)	1.46 (12.9)	8000	8000	300	0.045 (0.0040)
	AKM21C	AKD-X00306	23/60	0.48 (4.25)	1.48 (13.1)	8000	8000	320	0.107 (0.0095)
	AKM22C	AKD-X00306	23/60	0.84 (7.43)	2.73 (24.2)	3500	5650	290	0.161 (0.0142)
	AKM22E	AKD-X00306	23/60	0.87 (7.70)	2.42 (21.4)	8000	8000	580	0.161 (0.0142)
	AKM23D	AKD-X00306	23/60	1.15 (10.2)	3.89 (34.4)	5000	6540	530	0.216 (0.0191)
	AKM23F	AKD-X00606	23/60	1.18 (10.4)	3.88 (34.3)	8000	8000	780	0.216 (0.0191)
	AKM24D	AKD-X00306	23/60	1.40 (12.4)	4.84 (42.8)	4000	5410	540	0.270 (0.0239)
	AKM24F	AKD-X00606	23/60	1.41 (12.5)	4.82 (42.7)	8000	8000	930	0.270 (0.0239)
	AKM31C	AKD-X00306	na/80	1.15 (10.2)	3.87 (34.3)	2500	4050	290	0.330 (0.0292)
	AKM31E	AKD-X00306	na/80	1.20 (10.6)	3.23 (28.6)	6000	8000	600	0.330 (0.0292)
	AKM32E	AKD-X00306	na/80	2.04 (18.1)	5.97 (52.8)	3000	4710	600	0.590 (0.0522)
	AKM32H	AKD-X00606	na/80	2.10 (18.6)	6.22 (55.1)	7000	8000	1060	0.590 (0.0522)
	AKM33E	AKD-X00306	na/80	2.80 (24.8)	8.95 (79.2)	2000	3130	550	0.850 (0.0752)
	AKM33H	AKD-X00606	na/80	2.87 (25.4)	8.55 (75.7)	5500	6640	1300	0.850 (0.0752)
	AKM41E	AKD-X00306	34/90	2.01 (17.8)	5.33 (47.2)	3000	4850	570	0.810 (0.0717)
	AKM41H	AKD-X00606	34/90	2.05 (18.1)	5.49 (48.6)	6000	6000	1010	0.810 (0.0717)
	AKM42E	AKD-X00306	34/90	3.42 (30.3)	9.74 (86.2)	1800	2740	590	1.45 (0.128)
	AKM42G	AKD-X00606	34/90	3.51 (31.1)	11.0 (97.4)	3500	4660	1060	1.45 (0.128)
AKM43H	AKD-X00606	34/90	4.82 (42.7)	14.0 (124)	3000	3850	1210	2.09 (0.185)	
AKM43L	AKD-X01206	34/90	4.73 (41.9)	11.7 (104)	6000	6000	1590	2.09 (0.185)	
AKM44E	AKD-X00306	34/90	5.79 (51.2)	16.5 (146)	1200	1680	660	2.73 (0.242)	
AKM44H	AKD-X00606	34/90	5.89 (43.3)	17.0 (150)	2500	3250	1220	2.73 (0.242)	

Note 1: For complete AKM and AKD model nomenclature, refer to pages 68 and 70 respectively.  
 Note 2: Max mechanical speeds: 8000 RPM for AKM1, 2, 3 and 6000 RPM for AKM4, 5, 6, 7.



### AKM Servo Motor with AKD Servo Drive System Performance

AKM Servo Motor	AKD Servo Drive	Frame Size NEMA/ mm	Cont. Torque at stall Tcs Nm (lb-in)	Peak Torque at stall Tps Nm (lb-in)	Rated Speed Nrt'd RPM	Max System Speed <sup>2</sup> RPM	Power Prtd watts	Inertia (Jm) Kg-cm <sup>2</sup> (lb-in-s <sup>2</sup> x10 <sup>2</sup> )	
240 Vac	AKM51H	AKD-X00606	42/115	4.79 (42.4)	11.7 (104)	3000	4030	1220	3.42 (0.303)
	AKM51L	AKD-X01206	42/115	4.89 (43.3)	10.6 (93.8)	6000	6000	1260	3.42 (0.303)
	AKM52H	AKD-X00606	42/115	8.48 (75.1)	21.6 (191)	1800	2390	1420	6.22 (0.551)
	AKM52L	AKD-X01206	42/115	8.67 (76.7)	19.6 (173)	3500	4580	2350	6.22 (0.551)
	AKM53H	AKD-X00606	42/115	10.5 (92.9)	27.8 (246)	1500	1970	1650	9.12 (0.807)
	AKM53L	AKD-X01206	42/115	11.6 (103)	26.5 (235)	2500	3450	2510	9.12 (0.807)
	AKM54H	AKD-X00606	42/115	14.2 (126)	37.5 (332)	1000	1340	1400	11.9 (1.06)
	AKM54L	AKD-X01206	42/115	13.5 (119)	31.3 (277)	2500	3030	3010	11.9 (1.06)
	AKM62H	AKD-X00606	na/142	11.9 (105)	29.6 (262)	1000	1560	1170	16.9 (1.50)
	AKM62L	AKD-X01206	na/142	12.2 (108)	26.3 (233)	2500	3380	2620	16.9 (1.50)
	AKM63L	AKD-X01206	na/142	16.8 (149)	39.3 (348)	1500	2260	2330	24.2 (2.14)
	AKM63N	AKD-X02406	na/142	17.0 (150)	40.3 (357)	3000	3450	4080	24.2 (2.14)
	AKM64L	AKD-X01206	na/142	19.7 (174)	44.4 (393)	1500	2070	2890	31.6 (2.80)
	AKM64Q	AKD-X02406	na/142	19.5 (173)	43.1 (381)	3000	3440	4810	31.6 (2.80)
	AKM65L	AKD-X01206	na/142	24.6 (218)	55.4 (490)	1300	1660	3040	40.0 (3.54)
	AKM65P	AKD-X02406	na/142	24.5 (217)	53.9 (477)	2400	2750	4790	40.0 (3.54)
	AKM72P	AKD-X02406	na/180	29.5 (261)	65.8 (606)	1800	2170	4500	64.5 (5.71)
	AKM72Q	AKD-X02406	na/180	24.5 (217)	56.0 (496)	2000	2730	4860	64.5 (5.71)
AKM73P	AKD-X02406	na/180	41.4 (366)	93.5 (827)	1300	1610	4700	92.1 (8.15)	
AKM73Q	AKD-X02406	na/180	41.5 (367)	76.1 (674)	1500	2020	5250	92.1 (8.15)	
AKM74Q	AKD-X02406	na/180	46.8 (414)	90.7 (803)	1200	1710	5380	120 (10.6)	
400 Vac	AKM22C	AKD-X00307	23/60	0.84 (7.43)	2.73 (24.2)	8000	8000	570	0.161 (0.0142)
	AKM23D	AKD-X00307	23/60	1.15 (10.2)	3.89 (34.4)	8000	8000	760	0.216 (0.0191)
	AKM24D	AKD-X00307	23/60	1.40 (12.4)	4.84 (42.8)	8000	8000	920	0.270 (0.0239)
	AKM31C	AKD-X00307	na/80	1.15 (10.2)	3.87 (34.3)	5000	7100	520	0.330 (0.0292)
	AKM32E	AKD-X00307	na/80	2.04 (18.1)	5.97 (52.8)	6500	8000	1020	0.590 (0.0522)
	AKM33E	AKD-X00307	na/80	2.80 (24.8)	8.95 (79.2)	4500	5490	1100	0.850 (0.0752)
	AKM41E	AKD-X00307	34/90	2.01 (17.8)	5.33 (47.2)	6000	6000	990	0.810 (0.0717)
	AKM42E	AKD-X00307	34/90	3.42 (30.3)	9.74 (86.2)	3500	4790	1030	1.45 (0.128)
	AKM42G	AKD-X00607	34/90	3.51 (31.1)	11.0 (97.4)	6000	6000	1470	1.45 (0.128)
	AKM43H	AKD-X00607	34/90	4.82 (42.7)	14 (124)	5500	6000	1620	2.09 (0.185)
	AKM44E	AKD-X00307	34/90	5.79 (51.2)	16.5 (146)	2000	2940	1010	2.73 (0.242)
	AKM44H	AKD-X00607	34/90	5.89 (43.3)	17.0 (150)	4500	5710	1640	2.73 (0.242)
	AKM51H	AKD-X00607	42/115	4.79 (42.4)	11.7 (104)	6000	6000	1230	3.42 (0.303)
	AKM52H	AKD-X00607	42/115	8.48 (75.1)	21.6 (191)	3500	4180	2290	6.22 (0.551)
	AKM52L	AKD-X01207	42/115	8.67 (76.7)	19.6 (173)	6000	6000	2050	6.22 (0.551)
	AKM53H	AKD-X00607	42/115	10.5 (92.9)	27.8 (246)	3000	3450	2770	9.12 (0.807)
	AKM53L	AKD-X01207	42/115	11.6 (103)	26.5 (235)	5000	6000	3140	9.12 (0.807)
	AKM54H	AKD-X00607	42/115	14.2 (126)	37.5 (332)	1800	2340	2350	11.9 (1.06)
	AKM54L	AKD-X01207	42/115	13.5 (119)	31.3 (277)	4500	5310	3830	11.9 (1.06)
	AKM62H	AKD-X00607	na/142	11.9 (105)	29.6 (262)	2000	2730	2140	16.9 (1.50)
	AKM62L	AKD-X01207	na/142	12.2 (108)	26.3 (233)	5000	5920	3880	16.9 (1.50)
	AKM63L	AKD-X01207	na/142	16.8 (149)	39.3 (348)	3000	3950	4040	24.2 (2.14)
	AKM63N	AKD-X02407	na/142	17.0 (150)	40.3 (357)	5000	6000	4900	24.2 (2.14)
	AKM64L	AKD-X01207	na/142	19.7 (174)	44.4 (393)	3000	3640	4900	31.6 (2.80)
	AKM64Q	AKD-X02407	na/142	19.5 (173)	43.1 (381)	5000	6000	5600	31.6 (2.80)
	AKM65L	AKD-X01207	na/142	24.6 (218)	55.4 (490)	2500	2910	5030	40.0 (3.54)
	AKM65P	AKD-X02407	na/142	24.5 (217)	53.9 (477)	4000	4820	6240	40.0 (3.54)
	AKM72L	AKD-X01207	na/180	30.0 (266)	70.5 (624)	1500	2300	3970	64.5 (5.71)
	AKM72P	AKD-X02407	na/180	29.5 (261)	68.5 (606)	3000	3800	6280	64.5 (5.71)
	AKM72Q	AKD-X02407	na/180	24.5 (217)	56.0 (496)	4000	4780	6830	64.5 (5.71)
	AKM73L	AKD-X01207	na/180	41.7 (369)	95.4 (844)	1400	1720	5060	92.1 (8.15)
	AKM73P	AKD-X02407	na/180	41.4 (366)	93.5 (828)	2400	2820	7130	92.1 (8.15)
	AKM73Q	AKD-X02407	na/180	33.0 (292)	76.1 (674)	3000	3550	7920	92.1 (8.15)
	AKM74L	AKD-X01207	na/180	49.7 (440)	114 (1010)	1200	1450	5470	120 (10.6)
	AKM74P	AKD-X02407	na/180	52.3 (463)	125 (1110)	1800	2110	7050	120 (10.6)
	AKM74Q	AKD-X02407	na/180	46.8 (414)	90.7 (803)	2500	3000	8250	120 (10.6)

\* Note 1: For complete AKM and AKD model nomenclature, refer to pages 68 and 70 respectively.  
 Note 2: Max mechanical speeds: 8000 RPM for AKM1, 2, 3 and 6000 RPM for AKM4, 5, 6, 7.

# AKM<sup>®</sup> Systems Overview

## AKM Servo Motor with AKD Servo Drive System Performance

	AKM Servo Motor	Servo Drive	Frame Size NEMA/ mm	Cont.Torque at stall Tcs Nm (lb-in)	Peak Torque at stall Tps Nm (lb-in)	Rated Speed Nrid RPM	Max System Speed <sup>2</sup> RPM	Power Prtd watts	Inertia (Jm) Kg-cm <sup>2</sup> (lb-in-s <sup>2</sup> x10 <sup>-2</sup> )
400 Vac	AKM82T	AKD-X04807	na/260	75 (664)	130 (1150)	2500	3000	12400	172 (15.2)
	AKM83T	S772*	na/260	130 (1150)	249 (2200)	2200	2750	16100	334 (29.6)
	AKM84T	S772*	na/260	180 (1590)	324 (2860)	1800	2190	19800	495 (43.8)
480 Vac	AKM22C	AKD-X00307	23/60	0.84 (7.43)	2.34 (20.7)	8000	8000	570	0.161 (0.0142)
	AKM23D	AKD-X00307	23/60	1.15 (10.2)	3.89 (34.4)	8000	8000	760	0.216 (0.0191)
	AKM24D	AKD-X00307	23/60	1.40 (12.4)	4.84 (42.8)	8000	8000	920	0.270 (0.0239)
	AKM31C	AKD-X00307	na/80	1.15 (10.2)	3.35 (29.7)	6000	8000	570	0.330 (0.0292)
	AKM32E	AKD-X00307	na/80	2.04 (18.1)	5.97 (52.8)	8000	8000	1020	0.590 (0.0522)
	AKM33E	AKD-X00307	na/80	2.80 (24.8)	8.95 (79.2)	5000	6280	1190	0.850 (0.0752)
	AKM41E	AKD-X00307	34/90	2.01 (17.8)	5.33 (47.2)	6000	6000	990	0.810 (0.0717)
	AKM42E	AKD-X00307	34/90	3.42 (30.3)	9.74 (86.2)	4000	5470	1140	1.45 (0.128)
	AKM42G	AKD-X00607	34/90	3.51 (31.1)	11.0 (97.4)	6000	6000	1470	1.45 (0.128)
	AKM43H	AKD-X00607	34/90	4.82 (42.7)	14.0 (124)	6000	6000	1620	2.09 (0.185)
	AKM44E	AKD-X00307	34/90	5.79 (51.2)	16.5 (146)	2500	3370	1200	2.73 (0.242)
	AKM44H	AKD-X00607	34/90	5.89 (43.3)	17.0 (150)	5500	6000	1690	2.73 (0.242)
	AKM51H	AKD-X00607	42/115	4.79 (42.4)	11.7 (104)	6000	6000	1230	3.42 (0.303)
	AKM52H	AKD-X00607	42/115	8.48 (75.1)	21.6 (191)	4000	4780	2420	6.22 (0.551)
	AKM52L	AKD-X01207	42/115	8.67 (76.7)	19.6 (173)	6000	6000	2050	6.22 (0.551)
	AKM53H	AKD-X00607	42/115	10.5 (92.9)	27.8 (246)	3000	3940	2770	9.12 (0.807)
	AKM53L	AKD-X01207	42/115	11.6 (103)	26.5 (235)	6000	6000	2540	9.12 (0.807)
	AKM54H	AKD-X00607	42/115	14.2 (126)	37.5 (332)	2000	2680	2560	11.9 (1.06)
	AKM54L	AKD-X01207	42/115	13.5 (119)	31.3 (277)	5000	6000	3690	11.9 (1.06)
	AKM62H	AKD-X00607	na/142	11.9 (105)	29.6 (262)	2400	3120	2480	16.9 (1.50)
	AKM62L	AKD-X01207	na/142	12.2 (108)	26.3 (233)	6000	6000	3610	16.9 (1.50)
	AKM63L	AKD-X01207	na/142	16.8 (149)	39.3 (348)	3500	5410	4400	24.2 (2.14)
	AKM63N	AKD-X02407	na/142	17.0 (150)	40.3 (357)	6000	6000	4400	24.2 (2.14)
	AKM64L	AKD-X01207	na/142	19.7 (174)	44.4 (393)	3500	4160	5280	31.6 (2.80)
	AKM64Q	AKD-X02407	na/142	19.5 (173)	43.1 (381)	6000	6000	4620	31.6 (2.80)
	AKM65L	AKD-X01207	na/142	24.6 (218)	55.4 (490)	2800	3320	5450	40.0 (3.54)
	AKM65P	AKD-X02407	na/142	24.5 (217)	53.9 (477)	4500	5500	6360	40.0 (3.54)
	AKM72L	AKD-X01207	na/180	30.0 (266)	70.5 (624)	1800	2630	4580	64.5 (5.71)
	AKM72P	AKD-X02407	na/180	29.5 (261)	68.5 (606)	3000	4340	6680	64.5 (5.71)
	AKM72Q	AKD-X02407	na/180	29.5 (261)	56.0 (496)	4500	5460	6640	64.5 (5.71)
	AKM73L	AKD-X01207	na/180	41.7 (369)	95.4 (844)	1500	1970	5620	92.1 (8.15)
	AKM73P	AKD-X02407	na/180	41.4 (366)	93.5 (828)	2400	3220	7130	92.1 (8.15)
	AKM73Q	AKD-X02407	na/180	41.5 (367)	76.1 (674)	3500	4050	8060	92.1 (8.15)
AKM74L	AKD-X01207	na/180	49.7 (440)	114 (1010)	1400	1660	6080	120 (10.6)	
AKM74P	AKD-X02407	na/180	52.3 (463)	125 (1110)	1800	2420	7050	120 (10.6)	
AKM74Q	AKD-X02407	na/180	46.8 (414)	90.7 (803)	3000	3430	8580	120 (10.6)	
AKM82T	AKD-X04807	na/260	75 (664)	130 (1150)	3000	3000	11900	172 (15.2)	
AKM83T	S772*	na/260	130 (1150)	249 (2200)	2500	3000	15700	334 (29.6)	
AKM84T	S772*	na/260	180 (1590)	324 (2860)	2000	2500	19500	495 (43.8)	

Note 1: For complete AKM, AKD and S700 model nomenclature, refer to pages 68, 70 and 71 respectively.

Note 2: Max mechanical speeds: 8000 RPM for AKM1, 2, 3 and 6000 RPM for AKM4, 5, 6, 7.

\* AKD pairings not currently released, please contact Kollmorgen Customer Support for specific drive pairing options and system performance.

# Notes

A large grid of graph paper for taking notes, consisting of approximately 30 columns and 40 rows of small squares.

# AKM1x Performance Data

## AKM1x Performance Data – Up to 320 Vdc bus voltage

Parameters	Tol	Symbol	Units	AKM11			AKM12		AKM13	
				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 $\Delta T$ winding = 100°C ①②⑦⑧	Nom	$T_{cs}$	Nm	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 $\Delta T$ winding = 100°C ①②⑦⑧	Nom	$I_{cs}$	A <sub>RMS</sub>	1.16	1.45	2.91	1.51	2.72	1.48	2.40
Continuous Torque (Stall) for $\Delta T$ winding = 60°C ②	Nom	$T_{cs}$	Nm	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	$T_p$	Nm	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 <sub>RMS</sub>	4.65	5.79	11.6	6.06	10.9	5.93	9.6
Rated Torque (speed) ①②⑦⑧⑨		$T_{rtd}$	Nm	-	-	0.176	-	0.309	-	0.401
			lb-in	-	-	1.56	-	2.73	-	3.55
Rated Speed		$N_{rtd}$	rpm	-	-	600	-	3000	-	2000
Rated Power (speed) ①②⑦⑧		$P_{rtd}$	kW	-	-	0.11	-	0.10	-	0.08
			Hp	-	-	0.15	-	0.13	-	0.11
Rated Torque (speed) ①②⑦⑧⑨		$T_{rtd}$	Nm	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
Rated Torque (speed) ①②⑦⑧⑨		$T_{rtd}$	Nm	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	-
Rated Torque (speed) ①②⑦⑧⑨		$T_{rtd}$	Nm	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-
Rated Speed		$N_{rtd}$	rpm	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧		$P_{rtd}$	kW	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-
Rated Torque (speed) ①②⑦⑧⑨		$T_{rtd}$	Nm	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-
Rated Speed		$N_{rtd}$	rpm	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧		$P_{rtd}$	kW	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-

See following page for notes.



### AKM1x Performance Data – Up to 320 Vdc bus voltage (Continued)

Parameters	Tol	Symbol	Units	AKM11			AKM12		AKM13	
				B	C	E	C	E	C	D
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	0.158	0.129	0.064	0.207	0.112	0.278	0.169
			lb-in/A <sub>rms</sub>	1.40	1.14	0.57	1.83	0.99	2.46	1.50
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/k <sub>r</sub> rpm	10.2	8.3	4.1	13.3	7.2	17.9	10.9
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.0302	0.0303	0.0296	0.0480	0.0463	0.0618	0.0593
			lb-in/√W	0.267	0.268	0.262	0.425	0.410	0.547	0.525
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	18.23	12.11	3.11	12.4	3.9	13.5	5.41
Inductance (line-line)		L	mH	12.5	8.3	2.04	9.1	2.7	10.3	3.8
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.017			0.031		0.045	
			lb-in-s <sup>2</sup>	1.5E-05			2.7E-05		4.0E-05	
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	-			-		-	
			lb-in-s <sup>2</sup>	-			-		-	
Weight		W	kg	0.35			0.49		0.63	
			lb	0.8			1.1		1.4	
Static Friction ①⑨		T <sub>f</sub>	Nm	0.0011			0.0021		0.0031	
			lb-in	0.01			0.02		0.03	
Viscous Damping ①		K <sub>dv</sub>	Nm/k <sub>r</sub> rpm	0.0005			0.001		0.0015	
			lb-in/k <sub>r</sub> rpm	0.004			0.009		0.013	
Thermal Time Constant		TCT	minutes	4			6		7	
Thermal Resistance		R <sub>thw-a</sub>	°C/W	1.83			1.63		1.53	
Pole Pairs				3			3		3	
Heat Sink Size				10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate		10"x10"x1/4" Aluminum Plate	

**Notes:**

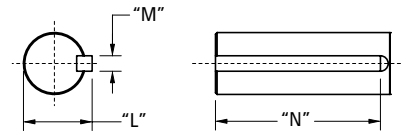
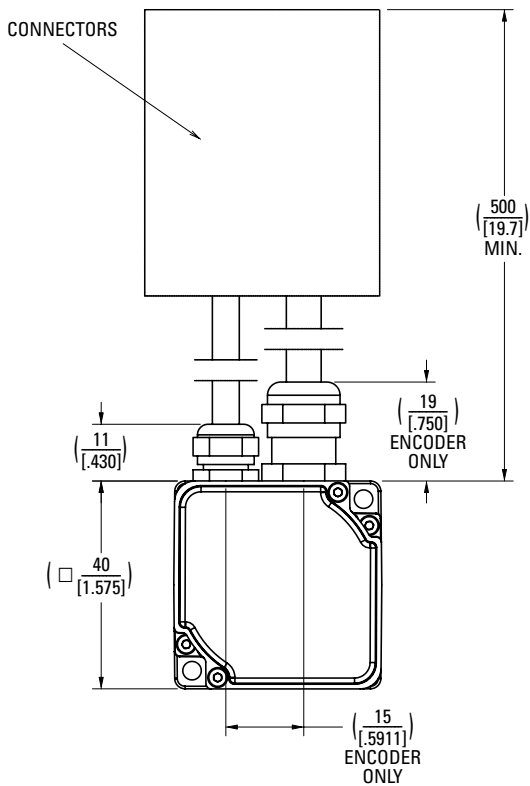
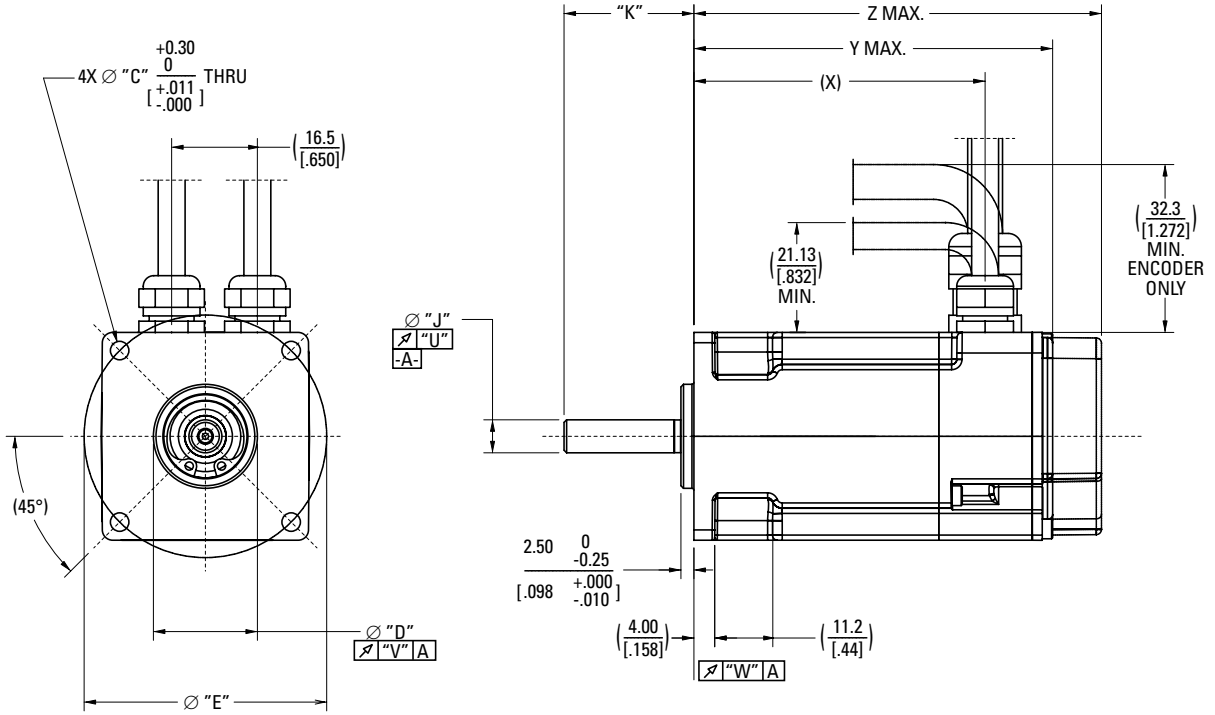
- ① Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of V<sub>bus</sub>.
- ⑥ Measured at 25°C.
- ⑦ No brake motor option on AKM1.
- ⑧ For non-resolver feedback options: no continuous torque reduction.
- ⑨ For motors with optional shaft seal, reduce torque shown by 0.021 Nm (0.19 lb-in), and increase T<sub>f</sub> by the same amount.

Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
 Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM1x Outline Drawings

## AKM1x Frame



# AKM1x Dimension Data

AKM 1 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM1x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AK	4.30 [0.169]	30 [1.1811]	46 [1.811]	–	–	8 [0.3150]	25 [0.984]	9.20 [0.362]
AN	4.30 [0.169]	30 [1.1811]	46 [1.811]	–	–	8 [0.3150]	25 [0.984]	–
BN	3.56 [0.140]	20.02 [0.788]	46.69 [1.838]	–	–	6.350 [0.2500]	25 [0.984]	–
CK	3.40 [0.134]	30 [1.1811]	45 [1.772]	–	–	8 [0.3150]	25 [0.984]	9.20 [0.362]
CN	3.40 [0.134]	30 [1.1811]	45 [1.772]	–	–	8 [0.3150]	25 [0.984]	–

Mounting Flange-Shaft	"M"	"N"
AK	3 [0.1181]	14 [0.551]
AN	–	–
BN	–	–
CK	3 [0.1181]	14 [0.551]
CN	–	–

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

Note 1: Dimensions are in mm [inches].

Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM2x Performance Data

## AKM2x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Symbol	Units	AKM21			AKM22			AKM23			AKM24		
				C	E	G	C	E	G	D	E	F	D	E	F
Max Rated DC Bus Voltage	Max	V <sub>bus</sub>	Vdc	320	160	75	640	320	160	640	320	320	640	320	320
Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T <sub>cs</sub>	Nm	0.48	0.50	0.50	0.84	0.87	0.88	1.16	1.16	1.18	1.41	1.40	1.42
			lb-in	4.2	4.4	4.4	7.4	7.7	7.8	10.3	10.3	10.4	12.5	12.4	12.6
Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	I <sub>cs</sub>	A <sub>rms</sub>	1.58	3.11	4.87	1.39	2.73	4.82	2.19	2.78	4.31	2.21	2.79	3.89
Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T <sub>cs</sub>	Nm	0.38	0.40	0.40	0.67	0.70	0.70	0.92	0.93	0.94	1.13	1.12	1.14
			lb-in	3.4	3.5	3.5	5.9	6.2	6.2	8.2	8.23	8.4	10.0	9.91	10.1
Max Mechanical Speed ⑤	Nom	N <sub>max</sub>	rpm	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Peak Torque ①②	Nom	T <sub>p</sub>	Nm	1.47	1.49	1.51	2.73	2.76	2.79	3.84	3.86	3.88	4.76	4.79	4.82
			lb-in	13.0	13.2	13.4	24.2	24.4	24.7	34.0	34.2	34.3	42.1	42.4	42.7
Peak Current	Nom	I <sub>p</sub>	A <sub>rms</sub>	6.3	12.4	19.5	5.6	10.9	19.3	8.8	11.1	17.2	8.8	11.2	15.6
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	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 <sub>rtd</sub>	rpm	-	2000	4000	-	1000	2500	-	-	1500	-	-	1000
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	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
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	0.46	0.41	-	0.83	0.81	0.74	1.12	1.1	1.07	1.36	1.34	1.33
			lb-in	4.0	3.7	-	7.3	7.1	6.5	9.9	9.7	9.5	12.0	11.9	11.8
Rated Speed		N <sub>rtd</sub>	rpm	2500	7000	-	1000	3500	7000	1500	2500	4500	1500	2000	3000
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	0.12	0.30	-	0.09	0.30	0.54	0.18	0.29	0.50	0.21	0.28	0.42
			Hp	0.16	0.41	-	0.12	0.40	0.72	0.24	0.39	0.68	0.29	0.38	0.56
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	0.39	-	-	0.78	0.70	-	1.03	0.98	0.94	1.29	1.24	1.12
			lb-in	3.4	-	-	6.9	6.2	-	9.1	8.7	8.3	11.4	11.0	9.9
Rated Speed		N <sub>rtd</sub>	rpm	8000	-	-	3500	8000	-	5000	6500	8000	4000	5500	8000
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	0.32	-	-	0.29	0.59	-	0.54	0.67	0.79	0.54	0.71	0.94
			Hp	0.43	-	-	0.38	0.79	-	0.72	0.89	1.06	0.72	0.96	1.26
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-	0.68	-	-	0.92	-	-	1.11	-	-
			lb-in	-	-	-	6.0	-	-	8.1	-	-	9.8	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	8000	-	-	8000	-	-	8000	-	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	-	-	0.57	-	-	0.77	-	-	0.93	-	-
			Hp	-	-	-	0.76	-	-	1.03	-	-	1.25	-	-
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-	0.68	-	-	0.92	-	-	1.11	-	-
			lb-in	-	-	-	6.0	-	-	8.1	-	-	9.8	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	8000	-	-	8000	-	-	8000	-	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	-	-	0.57	-	-	0.77	-	-	0.93	-	-
			Hp	-	-	-	0.76	-	-	1.03	-	-	1.25	-	-

See following page for notes.

**AKM2x Performance Data – Up to 640 Vdc bus voltage (Continued)**

Parameters	Tol	Symbol	Units	AKM21			AKM22			AKM23			AKM24		
				C	E	G	C	E	G	D	E	F	D	E	F
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	0.30	0.16	0.10	0.61	0.32	0.18	0.52	0.42	0.27	0.63	0.50	0.36
			lb-in/A <sub>rms</sub>	2.7	1.4	0.9	5.4	2.8	1.6	4.6	3.7	2.4	5.6	4.4	3.2
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/k <sub>r</sub> rpm	19.5	10.2	6.6	39	20.4	11.7	33.8	27.0	17.6	40.8	32.5	23.4
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.0679	0.0706	0.0680	0.111	0.114	0.110	0.143	0.147	0.144	0.171	0.175	0.171
			lb-in/√W	0.601	0.625	0.602	0.986	1.01	0.98	1.27	1.30	1.28	1.52	1.55	1.52
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	13	3.42	1.44	19.98	5.22	1.77	8.77	5.44	2.34	9.02	5.44	2.94
Inductance (line-line)		L	mH	19	5.2	2.18	35.5	9.7	3.19	17.3	11.1	4.68	18.7	11.8	6.16
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.11			0.16			0.22			0.27		
			lb-in-s <sup>2</sup>	9.5E-05			1.4E-04			1.9E-04			2.4E-04		
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.012			0.012			0.012			0.012		
			lb-in-s <sup>2</sup>	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 <sub>f</sub>	Nm	0.002			0.005			0.007			0.01		
			lb-in	0.02			0.04			0.06			0.09		
Viscous Damping ①		K <sub>dv</sub>	Nm/k <sub>r</sub> rpm	0.0046			0.0055			0.0065			0.0074		
			lb-in/k <sub>r</sub> rpm	0.04			0.05			0.06			0.07		
Thermal Time Constant		TCT	minutes	8			9			1.			11		
Thermal Resistance		R <sub>thw-a</sub>	°C/W	1.43			1.19			1.10			1.07		
Pole Pairs				3			3			3			3		
Heat Sink 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:**

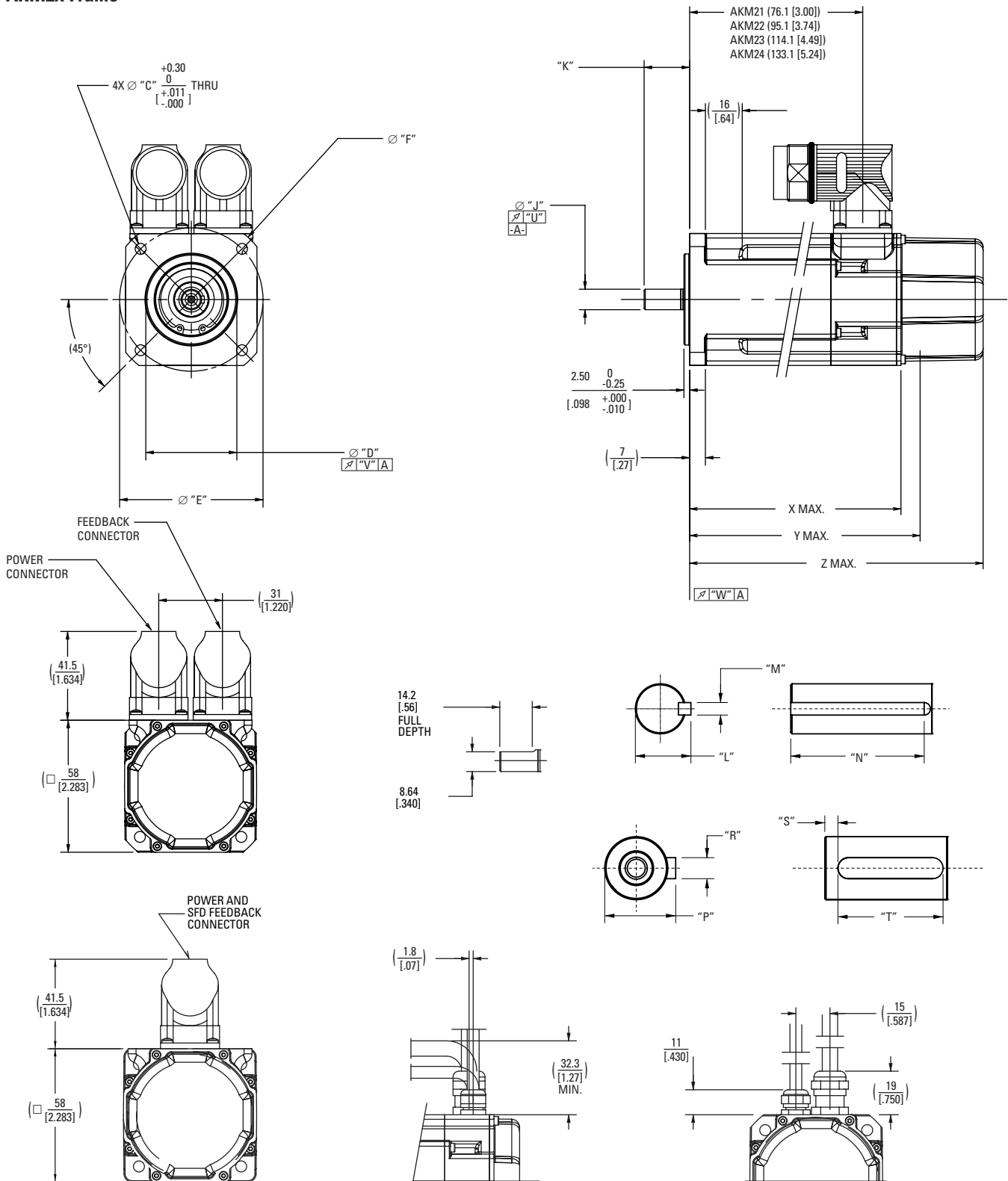
- ① Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of V<sub>bus</sub>.
- ⑥ Measured at 25°C.
- ⑦ Brake motor option reduces continuous torque ratings by:  
AKM21 = 0.00 AKM22 = 0.01 Nm AKM23 = 0.02 Nm AKM24 = 0.05 Nm
- ⑧ For non-resolver feedback options: no continuous torque reduction.
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM21 = 0.00 AKM22 = 0.02 Nm AKM23 = 0.05 Nm AKM24 = 0.12 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.047 Nm (0.41 lb-in), and increase T<sub>f</sub> by the same amount.

Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM2x Outline Drawings

## AKM2x Frame



AKM2X OUTLINE DRAWINGS



# AKM2x Dimension Data

AKM 2 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM2x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AC	4.80 [0.189]	40 [1.5748]	63 [2.480]	74 [2.913]	D M3 DIN 332	9 [0.3543]	20.0 [0.79]	-
AN	4.80 [0.189]	40 [1.5748]	63 [2.480]	74 [2.913]	D M3 DIN 332	9 [0.3543]	20.0 [0.79]	-
BN	5.10 [0.201]	38.10 [1.500]	66.68 [2.625]	-	-	9.525 [0.3750]	31.75 [1.250]	-
CK	5.80 [0.228]	50 [1.9685]	70 [2.756]	-	-	14 [0.5512]	30.0 [1.181]	16 [0.630]
DC	5.80 [0.228]	40 [1.5748]	65 [2.559]	-	D M3 DIN 332	9 [0.3543]	20.0 [0.79]	-
DN	5.80 [0.228]	40 [1.5748]	65 [2.559]	-	D M3 DIN 332	9 [0.3543]	20.0 [0.79]	-
EN & EF	5.10 [0.201]	38.10 [1.500]	66.68 [2.625]	-	-	9.525 [0.3750]	20.57 [0.810]	-

Mounting Flange-Shaft	"M"	"N"	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	-	-	10.2 [.402]	3 [1.181]	300 [1.118]	12 [.472]	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	5 [.197]	20 [.787]	-	-	-	-	0.035 [0.0013]	0.080 [0.0031]	0.080 [.0031]
DC	-	-	10.2 [.402]	3 [1.181]	300 [1.118]	12 [.472]	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
DN	-	-	-	-	-	-	0.030 [.0011]	0.060 [.0023]	0.060 [.0023]
EN & EF	-	-	-	-	-	-	0.051 [.0020]	0.10 [.004]	0.10 [.004]

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

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

\*Complete AKM series model nomenclature can be found on page 68.

# AKM3x Performance Data

## AKM3x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Symbol	Units	AKM31			AKM32			AKM33		
				C	E	H	C	E	H	C	E	H
Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	320	160	640	640	320	640	640	320
Continuous Torque (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$T_{cs}$	Nm	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 $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$I_{cs}$	$A_{rms}$	1.37	2.99	5.85	1.44	2.82	5.50	1.47	2.58	5.62
Continuous Torque (Stall) for $\Delta T$ winding = 60°C ②	Nom	$T_{cs}$	Nm	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	$T_p$	Nm	3.88	4.00	4.06	6.92	7.11	7.26	9.76	9.96	10.22
			lb-in	34.3	35.4	35.9	61.2	62.9	64.3	86.4	88.1	90.5
Peak Current	Nom	$I_p$	$A_{rms}$	5.5	12.0	23.4	5.7	11.3	22.0	5.9	10.3	22.5
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	-	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
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	-	1.17	0.97	-	2.01	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
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	1.12	0.95	-	1.95	1.91	1.45	2.64	2.62	2.27
			lb-in	9.9	8.4	-	17.3	16.9	12.8	23.4	23.2	20.1
Rated Speed		$N_{rtd}$	rpm	2500	6000	-	1500	3000	7000	1000	2000	5500
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	0.29	0.60	-	0.31	0.6	1.06	0.28	0.55	1.31
			Hp	0.39	0.80	-	0.41	0.80	1.42	0.37	0.74	1.75
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	1.00	-	-	1.86	1.50	-	2.54	2.34	-
			lb-in	8.9	-	-	16.5	13.3	-	22.5	20.7	-
Rated Speed		$N_{rtd}$	rpm	5000	-	-	3000	6500	-	2000	4500	-
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	0.52	-	-	0.58	1.02	-	0.53	1.10	-
			Hp	0.70	-	-	0.78	1.37	-	0.71	1.48	-
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	0.91	-	-	1.83	1.22	-	2.50	2.27	-
			lb-in	8.1	-	-	16.2	10.8	-	22.1	20.1	-
Rated Speed		$N_{rtd}$	rpm	6000	-	-	3500	8000	-	2500	5000	-
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	0.57	-	-	0.67	1.02	-	0.65	1.19	-
			Hp	0.77	-	-	0.90	1.37	-	0.88	1.59	-

See following page for notes.

### AKM3x Performance Data – Up to 640 Vdc bus voltage (Continued)

Parameters	Tol	Symbol	Units	AKM31			AKM32			AKM33		
				C	E	H	C	E	H	C	E	H
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	0.85	0.41	0.21	1.40	0.73	0.39	1.86	1.10	0.52
			lb-in/A <sub>rms</sub>	7.5	3.6	1.9	12.4	6.5	3.5	16.5	9.7	4.6
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/k <sub>r</sub> rpm	54.5	26.1	13.7	89.8	47.1	24.8	120	70.6	33.4
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.150	0.154	0.151	0.235	0.237	0.245	0.295	0.299	0.303
			lb-in/√W	1.33	1.36	1.34	2.08	2.10	2.17	2.61	2.65	2.68
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	21.4	4.74	1.29	23.76	6.32	1.69	26.59	9.01	1.96
Inductance (line-line)		L	mH	37.5	8.6	2.4	46.5	12.8	3.55	53.6	18.5	4.1
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.33			0.59			0.85		
			lb-in-s <sup>2</sup>	2.9E-04			5.2E-04			7.5E-04		
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.012			0.012			0.012		
			lb-in-s <sup>2</sup>	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 <sub>f</sub>	Nm	0.014			0.02			0.026		
			lb-in	0.12			0.18			0.23		
Viscous Damping ①		K <sub>dv</sub>	Nm/k <sub>r</sub> rpm	0.002			0.003			0.004		
			lb-in/k <sub>r</sub> rpm	0.02			0.03			0.04		
Thermal Time Constant		TCT	minutes	14			17			20		
Thermal Resistance		R <sub>thw-a</sub>	°C/W	1.11			0.92			0.78		
Pole Pairs				4			4			4		
Heat Sink Size				10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate			10"x10"x1/4" Aluminum Plate		

**Notes:**

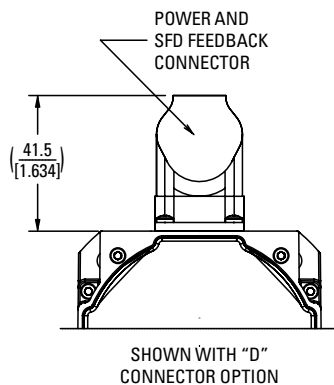
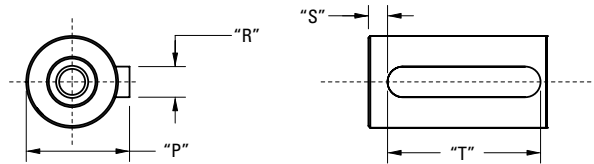
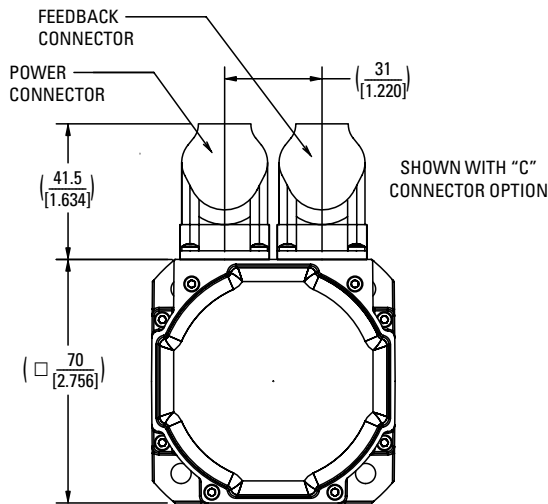
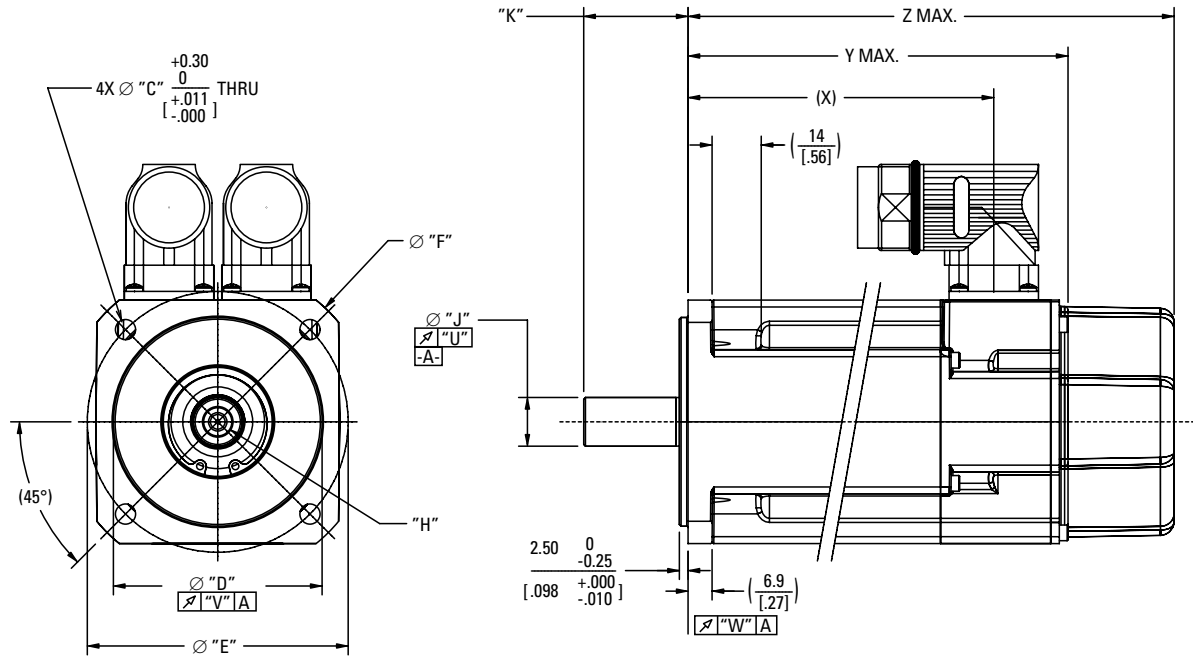
- ① Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of Vbus.
- ⑥ Measured at 25°C.
- ⑦ Brake motor option reduces continuous torque ratings by:  
AKM31 = 0.0 Nm    AKM32 = 0.05 Nm    AKM33 = 0.1 Nm
- ⑧ For non-resolver feedback options: no continuous torque reduction.
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM31 = 0.0 Nm    AKM32 = 0.1 Nm    AKM33 = 0.2 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.047 Nm (0.41 lb-in), and increase T<sub>f</sub> by the same amount.

Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
 Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

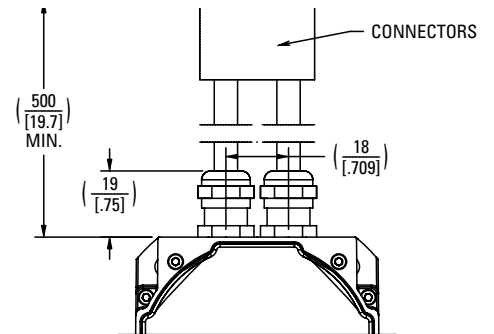
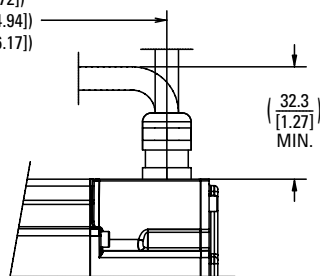
\*Complete AKM series model nomenclature can be found on page 68.

# AKM3x Outline Drawings

## AKM3x Frame



AKM31 (94.6 [3.72])  
AKM32 (125.6 [4.94])  
AKM33 (156.6 [6.17])



# AKM3x Dimension Data

AKM 3 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM3x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"P"
AC	5.80 [.228]	60 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	14 [.5512]	30.0 [1.181]	16 [.630]
AN	5.80 [.228]	60 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	14 [.5512]	30.0 [1.181]	–
CC	5.80 [.228]	60 [2.3622]	85 [3.346]	–	D M5 DIN 332	14 [.5512]	30.0 [1.181]	16 [.630]
CN	5.80 [.228]	60 [2.3622]	85 [3.346]	–	D M5 DIN 332	14 [.5512]	30.0 [1.181]	–
GC	5.80 [.228]	60 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	11 [.4331]	23 [.906]	12.5 [.492]
GN	5.80 [.228]	60 [2.3622]	75 [2.953]	90 [3.543]	D M5 DIN 332	11 [.4331]	23 [.906]	–

Mounting Flange-Shaft	"R"	"S"	"T"	"U"	"V"	"W"
AC	5 [.197]	5.00 [1.97]	20 [.787]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
AN	–	–	–	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CC	5 [.197]	5.00 [1.97]	20 [.787]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
CN	–	–	–	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
GC	4 [.157]	3.5 [.138]	16 [.630]	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]
GN	–	–	–	0.035 [.0013]	0.080 [.0031]	0.080 [.0031]

MODEL	(X)	Y MAX	Z MAX (W/ BRAKE)
AKM31	87.9 [3.46]	109.8 [4.32]	141.3 [5.56]
AKM32	118.9 [4.68]	140.8 [5.54]	172.3 [6.78]
AKM33	149.9 [5.90]	171.8 [6.76]	203.3 [8.00]

Note 1: Dimensions are in mm [inches].

Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM4x Performance Data

## AKM4x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Sym	Units	AKM41			AKM42				AKM43			AKM44		
				C	E	H	C	E	G	J	E	H	L	E	H	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 $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$T_{CS}$	Nm	1.95	2.02	2.06	3.35	3.42	3.53	3.56	4.70	4.82	4.73	5.76	5.89	6.00
			lb-in	17.3	17.9	18.2	29.6	30.3	31.2	31.5	41.6	42.7	41.9	51.0	52.1	53.1
Continuous Current (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$I_{CS}$	$A_{RMS}$	1.46	2.85	5.60	1.40	2.74	4.80	8.40	2.76	5.4	11.2	2.9	5.6	8.8
Continuous Torque (Stall) for $\Delta T$ winding = 60°C ②	Nom	$T_{CS}$	Nm	1.56	1.62	1.65	2.68	2.74	2.82	2.85	3.76	3.86	3.78	4.61	4.71	4.80
			lb-in	13.8	14.3	14.6	23.7	24.2	25.0	25.2	33.3	34.2	33.5	40.8	41.7	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	$T_p$	Nm	6.12	6.28	6.36	11.1	11.3	11.5	11.6	15.9	16.1	16.0	19.9	20.2	20.4
			lb-in	54.2	55.6	56.3	98.2	99.7	102	103	141	142	142	176	179	181
Peak Current	Nom	$I_p$	$A_{RMS}$	5.8	11.4	22.4	5.60	11.0	19.2	33.7	11.0	21.6	44.6	11.4	22.4	35.2
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{Rtd}$	Nm	-	-	1.99	-	-	-	-	-	-	-	-	-	-
			lb-in	-	-	17.6	-	-	-	-	-	-	-	-	-	-
Rated Speed		$N_{Rtd}$	rpm	-	-	1000	-	-	-	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧⑨		$P_{Rtd}$	kW	-	-	0.21	-	-	-	-	-	-	-	-	-	-
			Hp	-	-	0.28	-	-	-	-	-	-	-	-	-	-
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{Rtd}$	Nm	-	1.94	1.86	-	-	-	3.03	-	4.46	3.78	-	5.44	-
			lb-in	-	17.2	16.5	-	-	-	26.8	-	39.4	33.5	-	48.2	-
Rated Speed		$N_{Rtd}$	rpm	-	1200	3000	-	-	-	3000	-	1200	3000	-	1000	-
Rated Power (speed) ①②⑦⑧⑨		$P_{Rtd}$	kW	-	0.24	0.58	-	-	-	0.95	-	0.56	1.19	-	0.57	-
			Hp	-	0.33	0.78	-	-	-	1.28	-	0.75	1.59	-	0.76	-
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{Rtd}$	Nm	1.88	1.82	1.62	-	3.12	2.90	2.38	4.24	3.86	2.53	5.22	4.66	3.84
			lb-in	16.6	16.1	14.3	-	27.6	25.7	21.1	37.5	34.2	22.4	46.2	41.2	34.0
Rated Speed		$N_{Rtd}$	rpm	1200	3000	6000	-	1800	3500	6000	1500	3000	6000	1200	2500	4000
Rated Power (speed) ①②⑦⑧⑨		$P_{Rtd}$	kW	0.24	0.57	1.02	-	0.59	1.06	1.50	0.67	1.21	1.59	0.66	1.22	1.61
			Hp	0.32	0.77	1.36	-	0.79	1.42	2.00	0.89	1.63	2.13	0.88	1.64	2.16
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{Rtd}$	Nm	1.77	1.58	-	3.10	2.81	2.35	-	3.92	2.81	-	4.80	3.48	2.75
			lb-in	15.7	14.0	-	27.4	24.9	20.8	-	34.7	24.9	-	42.5	30.8	24.3
Rated Speed		$N_{Rtd}$	rpm	3000	6000	-	1500	3500	6000	-	2500	5500	-	2000	4500	6000
Rated Power (speed) ①②⑦⑧⑨		$P_{Rtd}$	kW	0.56	0.99	-	0.49	1.03	1.48	-	1.03	1.62	-	1.01	1.64	1.73
			Hp	0.75	1.33	-	0.65	1.38	1.98	-	1.38	2.17	-	1.35	2.20	2.32
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{Rtd}$	Nm	1.74	1.58	-	3.02	2.72	2.35	-	3.76	2.58	-	4.56	2.93	2.75
			lb-in	15.4	14.0	-	26.7	24.1	20.8	-	33.3	22.8	-	40.4	26.0	24.3
Rated Speed		$N_{Rtd}$	rpm	3500	6000	-	2000	4000	6000	-	3000	6000	-	2500	5500	6000
Rated Power (speed) ①②⑦⑧⑨		$P_{Rtd}$	kW	0.64	0.99	-	0.63	1.14	1.48	-	1.18	1.62	-	1.19	1.69	1.73
			Hp	0.85	1.33	-	0.85	1.53	1.98	-	1.58	2.17	-	1.60	2.27	2.32

See following page for notes.

**AKM4x Performance Data – Up to 640 Vdc bus voltage (Continued)**

Parameters	Tol	Sym	Units	AKM41			AKM42				AKM43			AKM44		
				C	E	H	C	E	G	J	E	H	L	E	H	J
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	1.34	0.71	0.37	2.40	1.26	0.74	0.43	1.72	0.89	0.43	2.04	1.06	0.69
			lb-in/A <sub>rms</sub>	11.9	6.3	3.3	21.2	11.2	6.5	3.8	15.2	7.9	3.8	18.1	9.4	6.1
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/krpm	86.3	45.6	23.7	154	80.9	47.5	27.5	111	57.4	27.5	132	68.0	44.2
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.237	0.236	0.242	0.374	0.369	0.381	0.393	0.479	0.501	0.465	0.567	0.580	0.581
			lb-in/√W	2.10	2.09	2.14	3.31	3.26	3.37	3.47	4.24	4.44	4.12	5.01	5.13	5.14
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	21.3	6.02	1.56	27.5	7.78	2.51	0.8	8.61	2.1	0.57	8.64	2.23	0.94
Inductance (line-line)		L	mH	66.1	18.4	5.0	97.4	26.8	9.2	3.1	32.6	8.8	2.0	33.9	9.1	3.8
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.81			1.5			2.1			2.7			
			lb-in-s <sup>2</sup>	7.2E-04			1.3E-03			1.8E-03			2.4E-03			
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.068			0.068			0.068			0.068			
			lb-in-s <sup>2</sup>	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 <sub>f</sub>	Nm	0.014			0.026			0.038			0.05			
			lb-in	0.12			0.23			0.34			0.44			
Viscous Damping ①		K <sub>dv</sub>	Nm/krpm	0.009			0.013			0.017			0.021			
			lb-in/krpm	0.08			0.12			0.15			0.19			
Thermal Time Constant		TCT	minutes	13			17			20			24			
Thermal Resistance		R <sub>thw-a</sub>	°C/W	0.97			0.80			0.70			.65			
Pole Pairs				5			5			5			5			
Heat Sink 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 heat sink.
- ⑤ May be limited at some values of V<sub>bus</sub>.
- ⑥ Measured at 25°C.
- ⑦ Brake motor option reduces continuous torque ratings by 0.12 Nm.
- ⑧ Non-Resolver feedback options reduces continuous ratings by:  
AKM41 = 0.1 Nm    AKM42 = 0.1 Nm    AKM43 = 0.2 Nm    AKM44 = 0.3 Nm
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM41 = 0.22 Nm    AKM42 = 0.36 Nm    AKM43 = 0.55 Nm    AKM44 = 0.76 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.071 Nm (0.63 lb-in), and increase T<sub>f</sub> by the same amount.

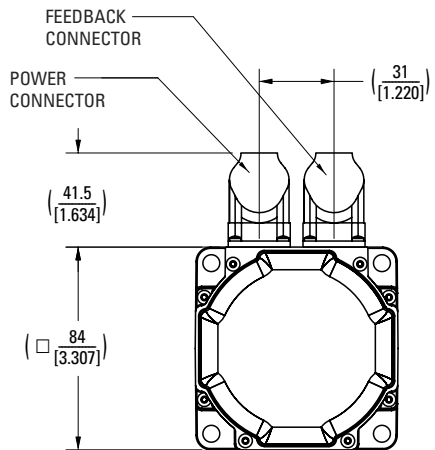
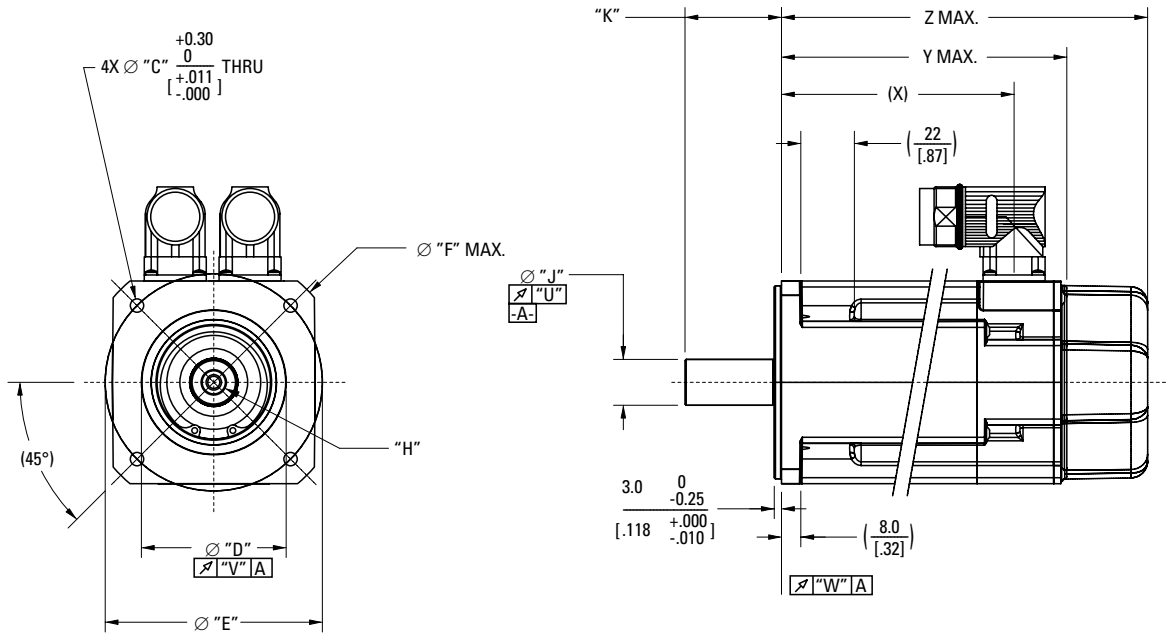
Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

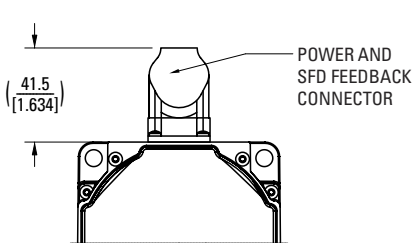
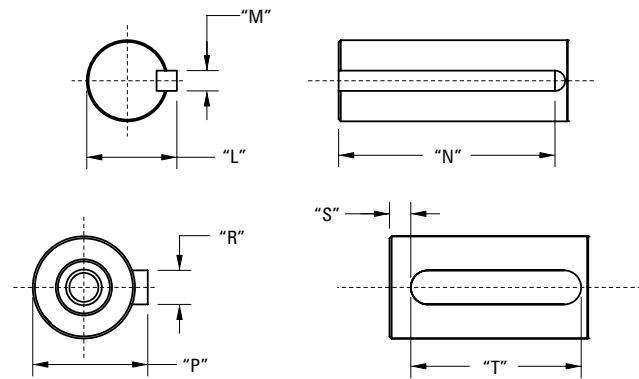


# AKM4x Outline Drawings

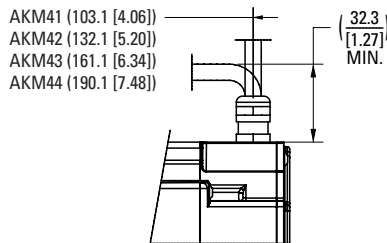
## AKM4x Frame



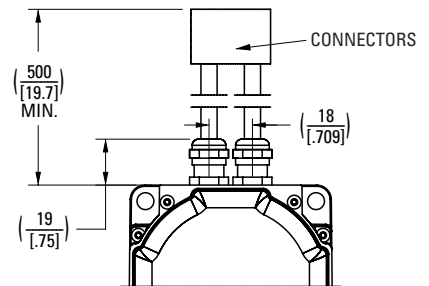
SHOWN WITH "C" CONNECTOR OPTION



SHOWN WITH "D" CONNECTOR OPTION



SHOWN WITH "M" OR "P" CONNECTOR OPTION



# AKM4x Dimension Data

AKM 4 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM4x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AC	7 [0.276]	80 [3.1496]	100 [3.937]	–	D M5 DIN 332	19 [0.7480]	40.0 [1.57]	–
AN	7 [0.276]	80 [3.1496]	100 [3.937]	–	D M5 DIN 332	19 [0.7480]	40.0 [1.57]	–
BK	5.54 [0.218]	73.025 [2.8750]	98.43 [3.875]	–	–	15.875 [0.6250]	52.40 [2.063]	17.92 [0.706]
CC	5.54 [0.218]	60 [2.3622]	90 [3.543]	109 [4.291]	D M5 DIN 332	19 [0.7480]	40.0 [1.57]	–
CN	5.54 [0.218]	60 [2.3622]	90 [3.543]	109 [4.291]	D M5 DIN 332	19 [0.7480]	40.0 [1.57]	–
EK	5.54 [0.218]	73.025 [2.8750]	98.43 [3.875]	–	–	12.7 [0.5000]	31.75 [1.250]	14.09 [0.555]
GC	7 [0.276]	80 [3.1496]	100 [3.937]	–	D M5 DIN 332	14 [0.5512]	30 [1.18]	–
GN	7 [0.276]	80 [3.1496]	100 [3.937]	–	D M5 DIN 332	14 [0.5512]	30 [1.18]	–
HC	5.54 [0.218]	60 [2.3622]	90 [3.543]	109 [4.291]	D M5 DIN 332	14 [0.5512]	30 [1.18]	–
HN	5.54 [0.218]	60 [2.3622]	90 [3.543]	109 [4.291]	D M5 DIN 332	14 [0.5512]	30 [1.18]	–
KK	7 [0.276]	70 [2.7559]	90 [3.543]	109 [4.291]	–	16 [0.6299]	40.0 [1.57]	–

Mounting Flange-Shaft	"M"	"N"	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	–	–	21.5 [0.846]	6 [0.236]	4.00 [1.57]	32 [1.260]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
AN	–	–	–	–	–	–	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
BK	4.762 [0.1875]	34.93 [1.375]	–	–	–	–	0.051 [0.0020]	0.10 [0.004]	0.10 [0.004]
CC	–	–	21.5 [0.846]	6 [0.236]	4.00 [1.57]	32 [1.260]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
CN	–	–	–	–	–	–	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
EK	3.175 [0.1250]	19.05 [0.750]	–	–	–	–	0.051 [0.0020]	0.10 [0.004]	0.10 [0.004]
GC	–	–	16 [0.630]	5 [0.197]	6.00 [0.236]	20 [0.787]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
GN	–	–	–	–	–	–	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
HC	–	–	16 [0.630]	5 [0.197]	6.00 [0.236]	20 [0.787]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
HN	–	–	–	–	–	–	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
KK	5 [0.197]	30 [1.811]	–	–	–	–	0.051 [0.0020]	0.008 [0.0031]	0.008 [0.0031]

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

Note 1: Dimensions are in mm [inches].  
 Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM5x Performance Data

## AKM5x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Sym	Units	AKM51			AKM52				AKM53				AKM54			
				E	H	L	E	H	L	M	G	H	L	P	H	K	L	N
Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	320	640	640	640	320	640	640	640	320	640	640	560	320
Continuous Torque (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	T <sub>cs</sub>	Nm	4.70	4.79	4.89	8.34	8.48	8.67	8.60	11.4	11.5	11.6	11.4	14.2	14.4	14.1	14.1
			lb-in	41.6	42.4	43.3	73.8	75.1	76.7	76.1	101	102	103	101	126	127	125	125
Continuous Current (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	I <sub>cs</sub>	A <sub>rms</sub>	2.75	6.0	11.9	2.99	5.9	11.6	13.1	4.77	6.6	11.8	19.1	5.5	9.7	12.5	17.8
Continuous Torque (Stall) for $\Delta T$ winding = 60°C ②	Nom	T <sub>cs</sub>	Nm	3.76	3.83	3.91	6.67	6.78	6.94	6.88	9.10	9.21	9.28	9.10	11.5	11.5	11.3	11.3
			lb-in	33.3	33.9	34.6	59.0	60.0	61.4	61.0	80.5	81.5	82.1	80.5	102	102	100	100
Max Mechanical Speed ⑤	Nom	N <sub>max</sub>	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Peak Torque ①②	Nom	T <sub>p</sub>	Nm	11.6	11.7	12.0	21.3	21.6	22.0	21.9	29.7	30.0	30.3	29.8	37.5	38.4	37.5	37.6
			lb-in	103	104	106	189	191	195	194	263	266	268	264	332	340	332	333
Peak Current	Nom	I <sub>p</sub>	A <sub>rms</sub>	8.24	18.0	35.7	9.00	17.7	34.8	39.4	14.3	19.8	35.4	57.4	16.5	29.2	37.5	53.4
Rated Torque (speed) ①②⑦⑧⑨⑩	75 Vdc	T <sub>rtd</sub>	Nm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Speed	75 Vdc	N <sub>rtd</sub>	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rated Power (speed) ①②⑦⑧⑨	75 Vdc	P <sub>rtd</sub>	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
			Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Rated Torque (speed) ①②⑦⑧⑨⑩	160 Vdc	T <sub>rtd</sub>	Nm	-	4.46	3.95	-	-	7.89	-	-	-	13.0	-	-	-	-	
			lb-in	-	39.4	35.0	-	-	69.9	-	-	-	115	-	-	-	-	
Rated Speed	160 Vdc	N <sub>rtd</sub>	rpm	-	1200	3000	-	-	1500	-	-	-	1200	-	-	-		
Rated Power (speed) ①②⑦⑧⑨	160 Vdc	P <sub>rtd</sub>	kW	-	0.56	1.24	-	-	1.24	-	-	-	1.63	-	-	-		
			Hp	-	0.75	1.66	-	-	1.66	-	-	-	2.18	-	-	-		
Rated Torque (speed) ①②⑦⑧⑨⑩	320 Vdc	T <sub>rtd</sub>	Nm	4.41	3.87	2.00	-	7.53	6.40	5.20	10.7	10.5	9.59	5.88	13.4	12.7	11.5	9.85
			lb-in	39.0	34.3	17.7	-	66.6	56.6	46.0	94.5	93.0	84.9	52.0	118	112	102	87.2
Rated Speed	320 Vdc	N <sub>rtd</sub>	rpm	1200	3000	6000	-	1800	3500	4500	1000	1500	2500	5000	1000	1800	2500	3500
Rated Power (speed) ①②⑦⑧⑨	320 Vdc	P <sub>rtd</sub>	kW	0.55	1.22	1.26	-	1.42	2.35	2.45	1.12	1.65	2.51	3.08	1.4	2.39	3.00	3.61
			Hp	0.74	1.63	1.69	-	1.90	3.15	3.28	1.50	2.21	3.36	4.13	1.87	3.20	4.03	4.84
Rated Torque (speed) ①②⑦⑧⑨⑩	560 Vdc	T <sub>rtd</sub>	Nm	3.98	1.97	-	7.61	6.26	3.27	-	9.85	8.83	6.00	-	12.6	10.05	8.13	-
			lb-in	35.2	17.4	-	67.3	55.4	2.89	-	87.2	78.2	53.1	-	112	88.9	72.0	-
Rated Speed	560 Vdc	N <sub>rtd</sub>	rpm	2500	6000	-	1500	3500	6000	-	2000	3000	5000	-	1800	3500	4500	
Rated Power (speed) ①②⑦⑧⑨	560 Vdc	P <sub>rtd</sub>	kW	1.04	1.24	-	1.20	2.30	2.06	-	2.06	2.77	3.14	-	2.38	3.68	3.83	-
			Hp	1.40	1.66	-	1.60	3.08	2.76	-	2.77	3.72	4.21	-	3.18	4.94	5.14	-
Rated Torque (speed) ①②⑦⑧⑨⑩	640 Vdc	T <sub>rtd</sub>	Nm	3.80	1.97	-	7.28	5.77	3.27	-	9.50	8.82	4.05	-	12.2	9.25	-	-
			lb-in	33.6	17.4	-	64.4	51.1	28.9	-	84.0	78.0	35.8	-	108	81.9	-	-
Rated Speed	640 Vdc	N <sub>rtd</sub>	rpm	3000	6000	-	2000	4000	6000	-	2400	3000	6000	-	2000	4000	-	
Rated Power (speed) ①②⑦⑧⑨	640 Vdc	P <sub>rtd</sub>	kW	1.19	1.24	-	1.52	2.42	2.06	-	2.39	2.77	2.55	-	2.56	3.87	-	-
			Hp	1.60	1.66	-	20.4	3.24	2.76	-	3.20	3.71	3.41	-	3.43	5.19	-	-

See following page for notes.

**AKM5x Performance Data – Up to 640 Vdc bus voltage (Continued)**

Parameters	Tol	Sym	Units	AKM51			AKM52				AKM53				AKM54			
				E	H	L	E	H	L	M	G	H	L	P	H	K	L	N
Torque Constant ①	±10%	K <sub>t</sub>	Nm/Arms	1.72	0.80	0.41	2.79	1.44	0.75	0.66	2.39	1.75	0.99	0.60	2.6	1.50	1.13	0.80
			lb-in/Arms	15.2	7.1	3.6	24.7	12.7	6.6	5.8	21.2	15.5	8.8	5.3	22.7	13.3	10.0	7.1
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/krpm	110	51.3	26.6	179	92.7	48.3	42.4	154	112	63.6	38.4	166	96.6	72.9	51.3
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.469	0.465	0.447	0.761	0.767	0.784	0.770	0.979	0.986	0.973	0.926	1.19	1.18	1.14	1.14
			lb-in/√W	4.15	4.12	3.96	6.73	6.79	6.94	6.81	8.67	8.73	8.61	8.19	10.5	10.4	10.1	10.1
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	8.98	1.97	0.56	8.96	2.35	0.61	0.49	3.97	2.1	0.69	0.28	3.2	1.08	0.65	0.33
Inductance (line-line)		L	mH	36.6	7.9	2.1	44.7	11.9	3.24	2.5	21.3	11.4	3.64	1.3	18.3	6.2	3.5	1.8
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	3.4			6.2				9.1				12			
			lb-in-s <sup>2</sup>	3.0E-03			5.5E-03				8.1E-03				0.011			
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.17			0.17				0.17				0.17			
			lb-in-s <sup>2</sup>	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 <sub>f</sub>	Nm	0.022			0.04				0.058				0.077			
			lb-in	0.19			0.35				0.51				0.68			
Viscous Damping ①		K <sub>dv</sub>	Nm/krpm	0.033			0.042				0.052				0.061			
			lb-in/krpm	0.29			0.37				0.46				0.54			
Thermal Time Constant		TCT	minutes	20			24				28				31			
Thermal Resistance		R <sub>thw-a</sub>	°C/W	0.68			0.56				0.50				0.45			
Pole Pairs				5			5				5				5			
Heat Sink Size				12"x12"x1/2" Aluminum Plate			12"x12"x1/2" Aluminum Plate				12"x12"x1/2" Aluminum Plate				12"x12"x1/2" 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 heat sink.
- 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 Nm    AKM52 = 0.26 Nm    AKM53 = 0.35 Nm    AKM54 = 0.43 Nm
- ⑧ Non-Resolver feedback options reduce continuous torque ratings by:  
AKM51 = 0.15 Nm    AKM52 = 0.34 Nm    AKM53 = 0.58 Nm    AKM54 = 0.86 Nm
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM51 = 0.39 Nm    AKM52 = 0.76 Nm    AKM53 = 1.13 Nm    AKM54 = 1.55 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.013 Nm (0.1.2 lb-in), and increase T<sub>f</sub> by the same amount.

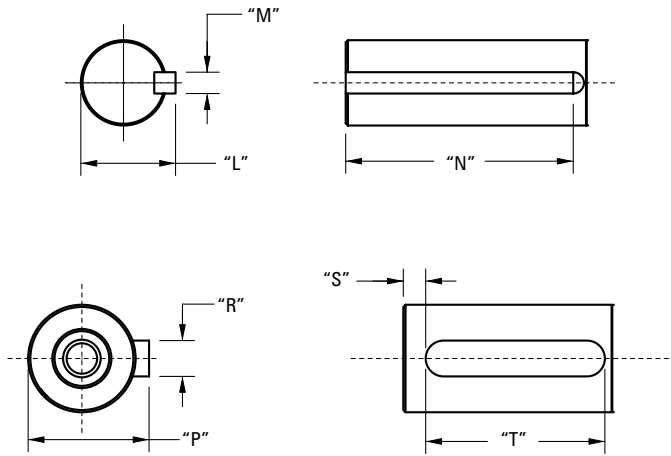
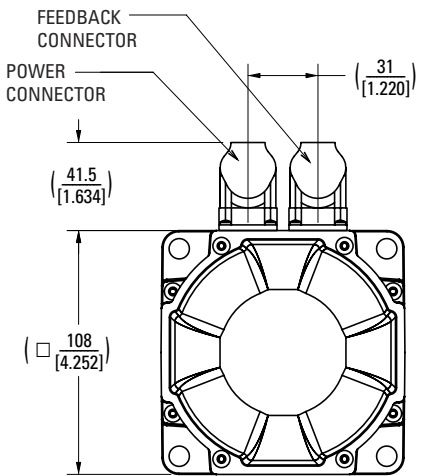
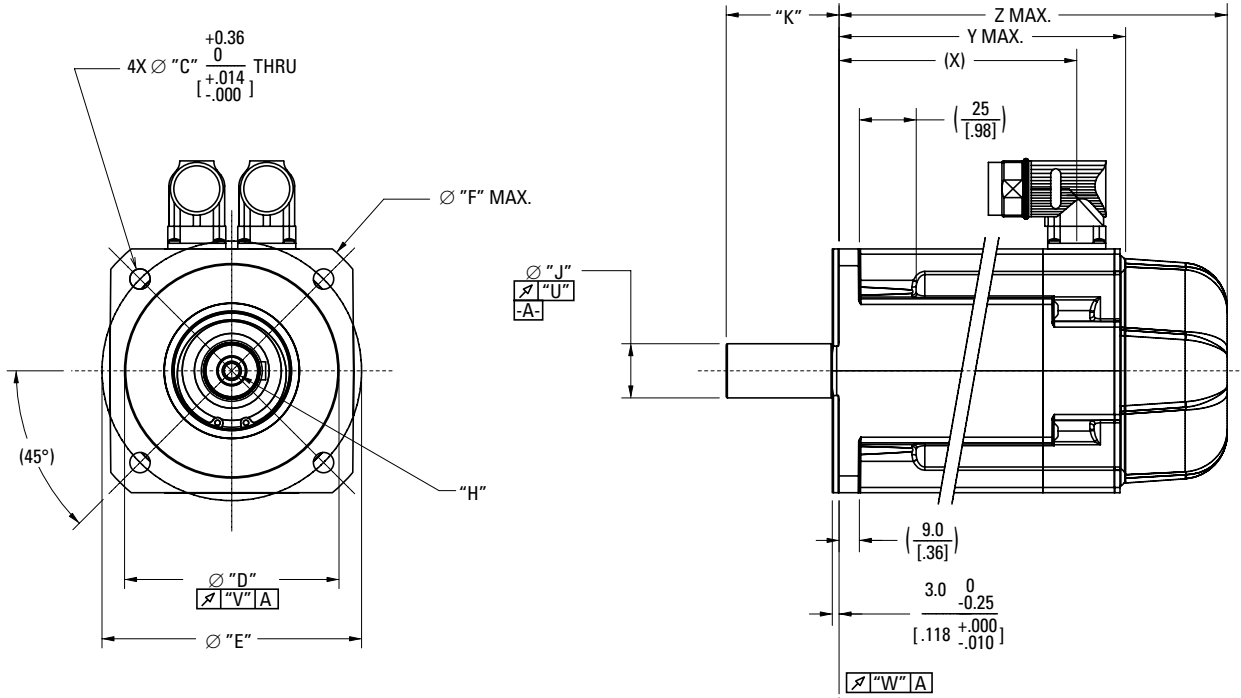
Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM5x Outline Drawings

AKM5X OUTLINE DRAWINGS

## AKM5x Frame



# AKM5x Dimension Data

AKM 5 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM5x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AC	9 [0.354]	110 [4.3307]	130 [5.118]	–	D M8 DIN 332	24 [0.9449]	50.0 [1.97]	–
AN	9 [0.354]	110 [4.3307]	130 [5.118]	–	D M8 DIN 332	24 [0.9449]	50.0 [1.97]	–
BK	8.33 [0.328]	55.563 [2.1874]	125.73 [4.950]	–	–	19.05 [0.7500]	57.15 [2.250]	21.15 [0.83]
CC	9 [0.354]	95 [3.7402]	115 [4.528]	140 [5.512]	D M8 DIN 332	24 [0.9449]	50.0 [1.97]	–
CN	9 [0.354]	95 [3.7402]	115 [4.528]	140 [5.512]	D M8 DIN 332	24 [0.9449]	50.0 [1.97]	–
DK	8.33 [0.328]	63.5 [2.500]	127 [5.000]	–	–	19.05 [0.7500]	57.15 [2.250]	21.15 [0.83]
EK	8.33 [0.328]	55.563 [2.1874]	125.73 [4.950]	–	–	15.875 [0.6250]	44.45 [1.750]	17.91 [0.705]
GC	9 [0.354]	110 [4.3307]	130 [5.118]	–	D M6 DIN 332	19 [0.7480]	40 [1.57]	–
GN	9 [0.354]	110 [4.3307]	130 [5.118]	–	D M6 DIN 332	19 [0.7480]	40.0 [1.57]	–
HC	9 [0.354]	95 [3.7402]	115 [4.528]	140 [5.512]	D M6 DIN 332	19 [0.7480]	40 [1.57]	–
HN	9 [0.354]	95 [3.7402]	115 [4.528]	140 [5.512]	D M6 DIN 332	19 [0.7480]	40.0 [1.57]	–

Mounting Flange-Shaft	"M"	"N"	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	–	–	27 [1.063]	8 [0.3150]	5.00 [0.197]	40 [1.575]	0.040 [0.0015]	0.100 [0.0039]	0.100 [0.0039]
AN	–	–	–	–	–	–	0.040 [0.0015]	0.100 [0.0039]	0.100 [0.0039]
BK	4.763 [0.1875]	38.1 [1.500]	–	–	–	–	0.051 [0.0020]	0.10 [0.004]	0.10 [0.004]
CC	–	–	27 [1.063]	8 [0.3150]	5.00 [0.197]	40 [1.575]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
CN	–	–	–	–	–	–	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
DK	4.763 [0.1875]	34.93 [1.375]	–	–	–	–	0.051 [0.0020]	0.05 [0.002]	0.10 [0.004]
EK	4.763 [0.1875]	38.1 [1.500]	–	–	–	–	0.051 [0.0020]	0.10 [0.004]	0.10 [0.004]
GC	–	–	21.5 [0.846]	6 [0.236]	4.00 [0.157]	32 [1.260]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
GN	–	–	–	–	–	–	–	–	–
HC	–	–	21.5 [0.846]	6 [0.236]	4.00 [0.157]	32 [1.260]	0.040 [0.0015]	0.080 [0.0031]	0.080 [0.0031]
HN	–	–	–	–	–	–	–	–	–

MODEL	Z MAX SINE ENCODER (NO BRAKE)	Z MAX SINE ENCODER (W/ BRAKE)	(X)	Y MAX	Z MAX (W/ BRAKE)
AKM51	146.0 [5.75]	189.0 [7.44]	105.3 [4.15]	127.5 [5.02]	172.5 [6.79]
AKM52	177.0 [6.97]	220.0 [8.66]	136.3 [5.37]	158.5 [6.24]	203.5 [8.01]
AKM53	208.0 [8.19]	251.0 [9.88]	167.3 [6.59]	189.5 [7.46]	234.5 [9.23]
AKM54	239.0 [9.41]	282.0 [11.10]	198.3 [7.81]	220.5 [8.68]	265.5 [10.45]

Note 1: Dimensions are in mm [inches].  
 Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM6x Performance Data

## AKM6x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Sym	Units	AKM62				AKM63				AKM64			AKM65		
				H	L	M	Q	H	L	M	Q	K	L	Q	L	M	P
Max Rated DC Bus Voltage	Max	V <sub>bus</sub>	Vdc	640	640	640	320	640	640	640	320	640	640	640	640	640	640
Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	T <sub>cs</sub>	Nm	11.9	12.2	12.2	12.0	16.6	16.8	17.0	16.7	20.8	21.0	20.6	25	25.0	24.5
			lb-in	105	108	108	106	147	149	150	148	184	186	182	221	221	217
Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨	Nom	I <sub>cs</sub>	A <sub>rms</sub>	5.4	12.0	13.4	21.8	5.6	11.1	13.8	22.4	9.2	12.8	20.7	12.2	13.6	19.8
Continuous Torque (Stall) for ΔT winding = 60°C ②	Nom	T <sub>cs</sub>	Nm	9.5	9.8	9.72	9.6	13.3	13.4	13.6	13.4	16.6	16.8	16	20	20.0	19.6
			lb-in	84	87	86.0	85	118	119	120	119	147	149	142	177	177	173
Max Mechanical Speed ⑤	Nom	N <sub>max</sub>	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Peak Torque ①②	Nom	T <sub>p</sub>	Nm	29.6	30.1	30.2	29.8	42.1	42.6	43.0	42.4	53.5	54.1	53.2	65.2	65.2	65.2
			lb-in	262	266	267	264	373	377	381	374	473	479	471	577	577	577
Peak Current	Nom	I <sub>p</sub>	A <sub>rms</sub>	16.2	36.0	40.3	65.4	16.8	33.3	41.4	67.2	27.5	38.4	62.1	36.6	40.9	59.4
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Speed		N <sub>rtd</sub>	rpm	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Hp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	10.8	10.0	9.50	6.5	-	14.2	14.3	11.9	18.8	18.4	15.3	22.4	21.9	19.1
			lb-in	99	89	84.1	58	-	126	127	105	166	163	135	198	194	169
Rated Speed		N <sub>rtd</sub>	rpm	1000	2500	3000	5500	-	1500	2000	3500	1200	1500	3000	1300	1500	2400
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	1.17	2.62	2.98	3.74	-	2.23	2.99	4.36	2.36	2.89	4.81	3.05	3.44	4.8
			Hp	1.57	3.51	4.00	5.02	-	2.99	4.01	5.85	3.17	3.87	6.45	4.09	4.61	6.44
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	10.2	7.42	5.70	-	14.6	12.9	11.3	-	17.2	15.6	10.7	19.2	18.8	14.9
			lb-in	90.3	65.7	50.4	-	129	114	100	-	152	138	95	170	166	132
Rated Speed		N <sub>rtd</sub>	rpm	2000	5000	6000	-	1500	3000	4000	-	2000	3000	5000	2500	2700	4000
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	2.14	3.89	3.58	-	2.29	4.05	4.73	-	3.60	4.90	5.6	5.03	5.32	6.24
			Hp	2.86	5.21	4.80	-	3.08	5.43	6.34	-	4.83	6.57	7.51	6.74	7.13	8.37
Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	9.9	5.74	5.70	-	14.2	12.0	10.5	-	16.3	14.4	7.4	18.6	18.1	11.6
			lb-in	87.6	50.8	50.4	-	126	106	92.9	-	144	127	66	165	160	103
Rated Speed		N <sub>rtd</sub>	rpm	2400	6000	6000	-	1800	3500	4500	-	2500	3500	6000	2800	3000	5000
Rated Power (speed) ①②⑦⑧⑨		P <sub>rtd</sub>	kW	2.49	3.61	3.58	-	2.68	4.4	4.95	-	4.27	5.28	4.65	5.37	5.69	6.08
			Hp	3.34	4.84	4.80	-	3.59	5.90	6.63	-	5.72	7.07	6.23	7.2	7.62	8.14

See following page for notes.



### AKM6x Performance Data – Up to 640 Vdc bus voltage (Continued)

Parameters	Tol	Sym	Units	AKM62				AKM63				AKM64			AKM65		
				H	L	M	Q	H	L	M	Q	K	L	Q	L	M	P
Torque Constant ①	±10%	K <sub>t</sub>	Nm/Arms	2.2	1.0	0.91	0.60	3.00	1.5	1.24	0.75	2.28	1.66	1.0	2.1	1.85	1.3
			lb-in/Arms	19.5	8.85	8.1	5.3	26.6	13.3	11.0	7.1	20.2	14.7	8.85	18.6	16.4	11.5
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/krpm	142	65.5	58.8	35.5	191.5	98.2	79.9	48.3	147	107	64.4	133	119	80.5
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	0.989	0.949	0.984	1.00	1.32	1.26	1.30	1.28	1.57	1.57	1.44	1.81	1.77	1.75
			lb-in/√W	8.75	8.40	8.71	8.85	11.7	11.2	11.5	11.3	13.9	13.9	12.8	16.0	15.6	15.4
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	3.3	0.74	0.57	0.24	3.43	0.94	0.61	0.23	1.41	0.75	0.32	0.90	0.73	0.37
Inductance (line-line)		L	mH	25.4	5.4	4.4	1.6	28.1	7.4	4.9	1.8	11.8	6.2	2.3	7.6	6.1	2.8
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	17				24				32			40		
			lb-in-s <sup>2</sup>	0.015				0.021				0.028			0.035		
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	0.61				0.61				0.61			0.61		
			lb-in-s <sup>2</sup>	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 <sub>f</sub>	Nm	0.05				0.1				0.15			0.2		
			lb-in	0.44				0.9				1.3			1.8		
Viscous Damping ①		K <sub>dv</sub>	Nm/krpm	0.04				0.06				0.08			0.1		
			lb-in/krpm	0.35				0.53				0.71			0.9		
Thermal Time Constant		TCT	minutes	20				25				30			35		
Thermal Resistance		R <sub>thw-a</sub>	°C/W	0.46				0.41				0.38			0.35		
Pole Pairs				5				5				5			5		
Heat Sink Size				18"x18"x1/2" Aluminum Plate				18"x18"x1/2" Aluminum Plate				18"x18"x1/2" Aluminum Plate			18"x18"x1/2" 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 heat sink.
- 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 Nm    AKM63 = 0.9 Nm    AKM64 = 1.3 Nm    AKM65 = 1.7 Nm
- ⑧ Non-Resolver feedback options reduce continuous torque ratings by:  
AKM62 = 0.9 Nm    AKM63 = 1.2 Nm    AKM64 = 1.5 Nm    AKM65 = 1.8 Nm
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM62 = 1.6 Nm    AKM63 = 2.4 Nm    AKM64 = 3.1 Nm    AKM65 = 4.0 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.25 Nm (2.21 lb-in), and increase T<sub>f</sub> by the same amount.

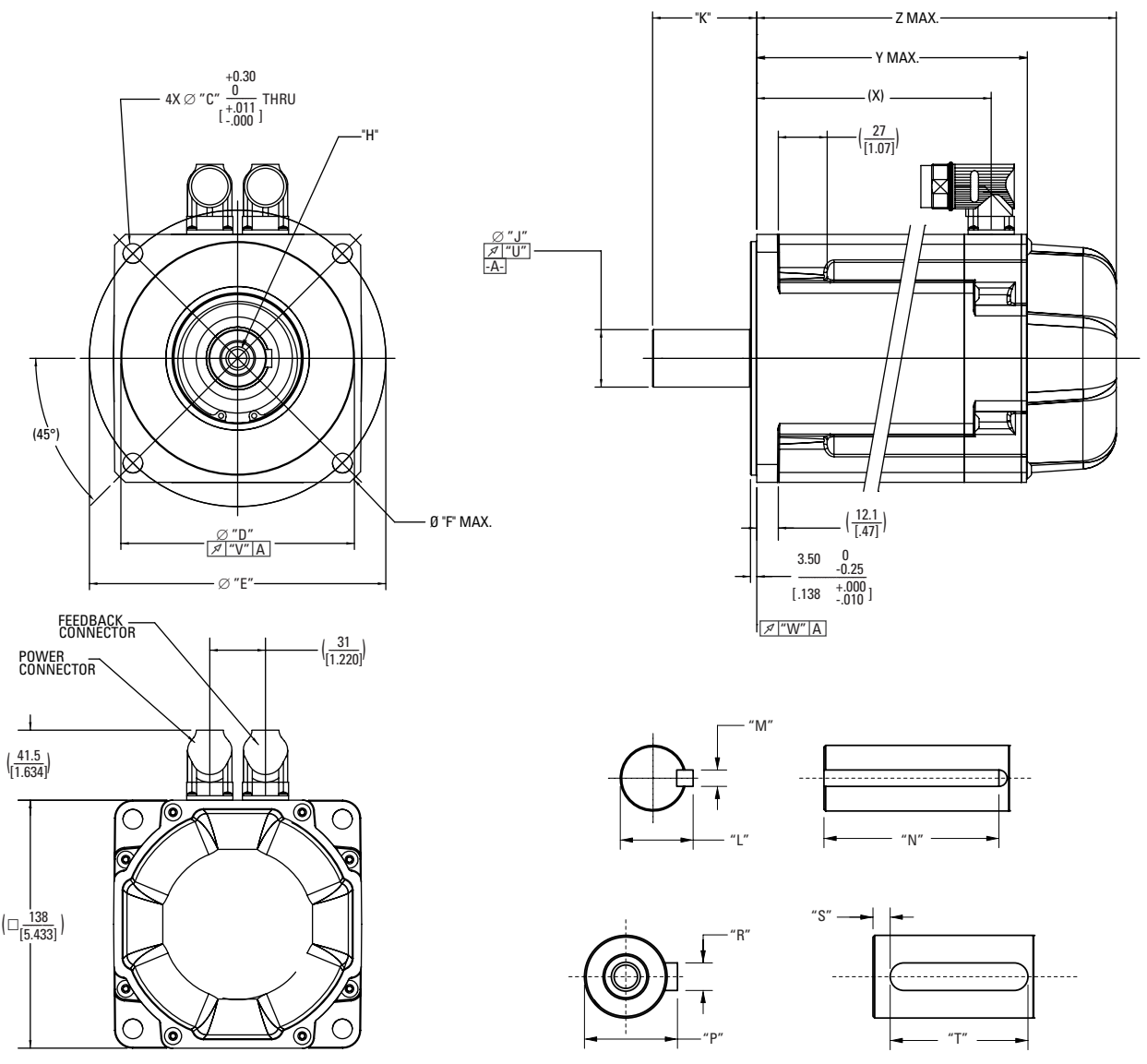
Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM6x Outline Drawings

AKM6X OUTLINE DRAWINGS

## AKM6x Frame



# AKM6x Dimension Data

AKM 6 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM6x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AC	11.00 [0.433]	130 [5.1181]	165.00 [6.496]	–	D M12 DIN 332	32 [1.2598]	58 [2.28]	–
AN	11.00 [0.433]	130 [5.1181]	165.00 [6.496]	–	D M12 DIN 332	32 [1.2598]	58 [2.28]	–
GC	11.00 [0.433]	130 [5.1181]	165.00 [6.496]	–	D M8 DIN 332	24 [0.9449]	50 [1.97]	–
GN	11.00 [0.433]	130 [5.1181]	165.00 [6.496]	–	D M8 DIN 332	24 [0.9449]	50 [1.97]	–
KK	9.00 [0.354]	110 [4.3307]	145.00 [5.709]	165 [6.496]	–	28 [1.1024]	60 [2.36]	31 [1.220]
LK	3/18 - 16 UNC-2B	114.3 [4.5000]	149.225 [5.875]	165 [6.496]	–	28.580 [1.1250]	69.85 [2.75]	31.39 [1.236]

Mounting Flange-Shaft	"M"	"N"	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	–	–	35 [1.378]	10 [0.3937]	5.00 [0.197]	45 [1.772]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
AN	–	–	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
GC	–	–	27 [1.063]	8 [0.3150]	5.00 [0.197]	40 [1.575]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
GN	–	–	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
KK	8 [0.3150]	50 [1.969]	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
LK	6.35 [2.75]	38.1 [1.500]	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]

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

Note 1: Dimensions are in mm [inches].  
 Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM7x Performance Data

## AKM7x Performance Data – Up to 640 Vdc bus voltage

Parameters	Tol	Symbol	Units	AKM72			AKM73			AKM74		
				L	P	Q	L	P	Q	L	P	Q
Max Rated DC Bus Voltage	Max	Vbus	Vdc	640	640	640	640	640	640	640	640	640
Continuous Torque (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$T_{cs}$	Nm	30	29.4	29.5	42	41.6	41.5	53.0	52.5	52.2
			lb-in	266	260	261	372	368	367	469	465	426
Continuous Current (Stall) for $\Delta T$ winding = 100°C ①②⑦⑧⑨	Nom	$I_{cs}$	$A_{rms}$	11.5	18.7	23.5	12.1	19.5	24.5	12.9	18.5	26.1
Continuous Torque (Stall) for $\Delta T$ winding = 60°C ②	Nom	$T_{cs}$	Nm	24	23.5	23.6	33.6	33.3	33.2	42.4	42.0	41.8
			lb-in	212	208	209	297	295	294	375	372	370
Max Mechanical Speed ⑤	Nom	$N_{max}$	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
Peak Torque ①②	Nom	$T_p$	Nm	79.5	78.5	78.4	113	111	111	143	142	141
			lb-in	704	695	694	1000	985	982	1269	1253	1250
Peak Current	Nom	$I_p$	$A_{rms}$	34.5	56.1	70.5	36.3	58.6	73.5	38.7	55.5	78.3
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	-	-	-	-	-	-	-	-	-
			lb-in	-	-	-	-	-	-	-	-	-
Rated Speed		$N_{rtd}$	rpm	-	-	-	-	-	-	-	-	
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	-	-	-	-	-	-	-	-	
			Hp	-	-	-	-	-	-	-	-	
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	-	-	-	-	-	-	-	-	
			lb-in	-	-	-	-	-	-	-	-	
Rated Speed		$N_{rtd}$	rpm	-	-	-	-	-	-	-		
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	-	-	-	-	-	-	-	-	
			Hp	-	-	-	-	-	-	-	-	
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	-	23.8	23.3	-	34.7	33.4	-	-	42.8
			lb-in	-	211	205	-	307	296	-	-	379
Rated Speed		$N_{rtd}$	rpm	-	1800	2000	-	1300	1500	-	-	1200
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	-	4.49	4.86	-	4.72	5.25	-	-	5.38
			Hp	-	6.01	6.52	-	6.33	7.04	-	-	7.21
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	25.3	20.1	16.3	34.4	28.5	25.2	43.5	39.6	31.5
			lb-in	224	178	144	304	252	223	385	350	279
Rated Speed		$N_{rtd}$	rpm	1500	3000	4000	1400	2400	3000	1200	1800	2500
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	3.97	6.31	6.83	5.04	7.16	7.92	5.47	7.46	8.25
			Hp	5.32	8.46	9.16	6.76	9.60	10.6	7.33	10.0	11.1
Rated Torque (speed) ①②⑦⑧⑨⑩		$T_{rtd}$	Nm	24.3	18.2	14.1	33.8	26.3	22.0	41.5	35.9	27.3
			lb-in	215	161	125	299	233	195	367	318	242
Rated Speed		$N_{rtd}$	rpm	1800	3500	4500	1500	2800	3500	1400	2000	3000
Rated Power (speed) ①②⑦⑧⑨		$P_{rtd}$	kW	4.58	6.67	6.65	5.31	7.71	8.07	6.08	7.52	8.58
			Hp	6.14	8.94	8.91	7.12	10.3	10.8	8.16	10.1	11.5

See following page for notes.

**AKM7x Performance Data – Up to 640 Vdc bus voltage (Continued)**

Parameters	Tol	Symbol	Units	AKM72			AKM73			AKM74		
				L	P	Q	L	P	Q	L	P	Q
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	2.6	1.58	1.3	3.5	2.13	1.7	4.14	2.84	2.0
			lb-in/A <sub>rms</sub>	23.0	14.0	11.5	31.0	18.9	15	36.6	25.1	17.7
Back EMF Constant ②	±10%	K <sub>e</sub>	V/krpm	169	102	81.2	225	137	109	266	183	129
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	2.21	2.18	2.08	2.93	2.82	2.67	3.51	3.38	3.27
			lb-in/√W	19.6	19.3	18.4	25.9	25.0	23.6	31.0	29.9	28.9
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	0.92	0.35	0.26	0.95	0.38	0.25	0.93	0.47	0.25
Inductance (line-line)		L	mH	13.6	5.0	3.2	15.7	5.9	3.7	16.4	7.7	3.8
Inertia (includes Resolver feedback) ③	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	65			92			120		
			lb-in-s <sup>2</sup>	0.057			0.082			0.11		
Optional Brake Inertia (additional)	±10%	J <sub>m</sub>	kg-cm <sup>2</sup>	1.64			1.64			1.64		
			lb-in-s <sup>2</sup>	1.46 x 10 <sup>-3</sup>			1.46 x 10 <sup>-3</sup>			1.46 x 10 <sup>-3</sup>		
Weight		W	kg	19.7			26.7			33.6		
			lb	43.4			58.8			74.0		
Static Friction ①⑩		T <sub>f</sub>	Nm	0.16			0.24			0.33		
			lb-in	1.4			2.1			2.9		
Viscous Damping ①		K <sub>dv</sub>	Nm/krpm	0.06			0.13			0.2		
			lb-in/krpm	0.5			1.2			1.8		
Thermal Time Constant		TCT	minutes	46			53			60		
Thermal Resistance		R <sub>thw-a</sub>	°C/W	0.39			0.33			0.30		
Pole Pairs				5			5			5		
Heat Sink Size				18"x18"x1/2" Aluminum Plate			18"x18"x1/2" Aluminum Plate			18"x18"x1/2" Aluminum Plate		

**Notes:**

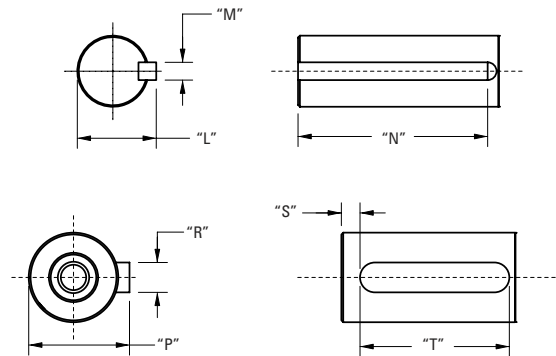
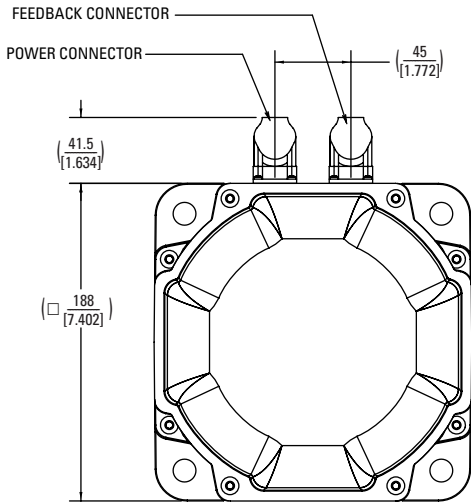
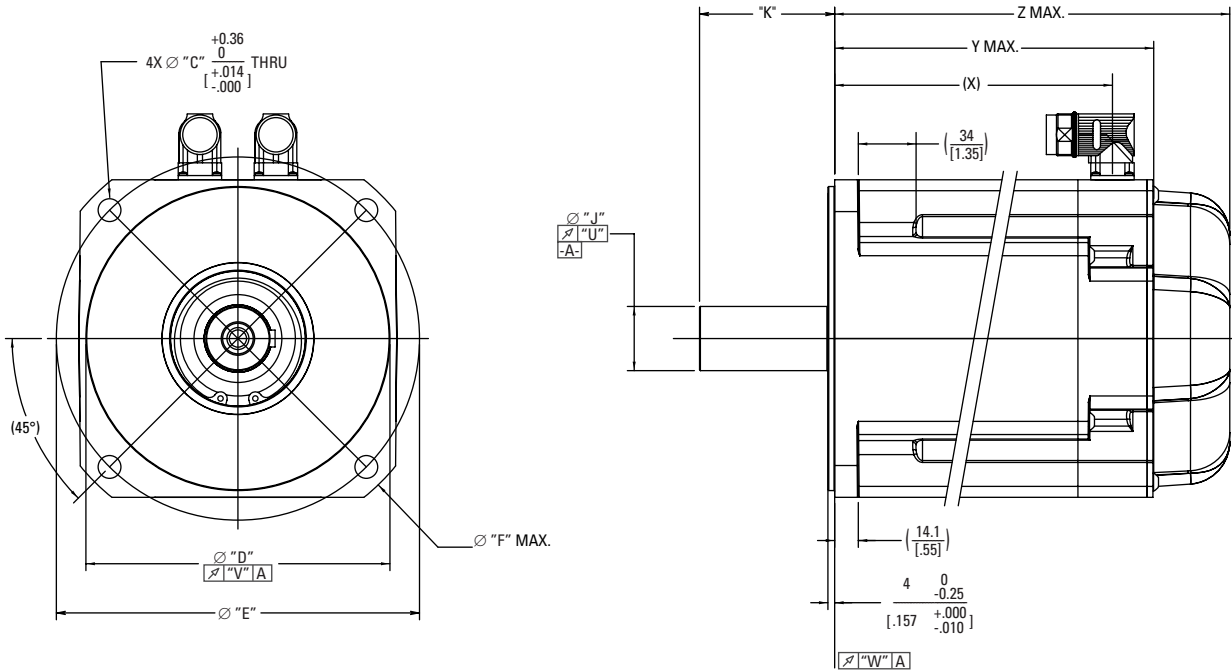
- ① Motor winding temperature rise, ΔT=100°C, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of V<sub>bus</sub>.
- ⑥ Measured at 25°C.
- ⑦ Brake motor option reduces continuous torque ratings by 1 Nm.
- ⑧ Non-Resolver feedback options reduce continuous torque ratings by:  
AKM72 = 2.0 Nm    AKM73 = 2.7 Nm    AKM74 = 3.4 Nm
- ⑨ Motors with non-resolver feedback and brake option, reduce continuous torque by:  
AKM72 = 3.9 Nm    AKM73 = 5.1 Nm    AKM74 = 6.2 Nm
- ⑩ For motors with optional shaft seal, reduce torque shown by 0.25 Nm (2.21 lb-in), and increase T<sub>f</sub> by the same amount.

Additional Notes: See system data beginning on page 12 for typical torque/speed performance.  
Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM7x Outline Drawings

## AKM7x Frame



# AKM7x Dimension Data

AKM 7 2 A - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM7x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	"L"
AC	13.50 [0.531]	180 [7.0866]	215.00 [8.465]	–	D M12 DIN 332	38 [1.496]	80 [3.15]	–
AN	13.50 [0.531]	180 [7.0866]	215.00 [8.465]	–	D M12 DIN 332	38 [1.496]	80 [3.15]	–
GC	13.50 [0.531]	180 [7.0866]	215.00 [8.465]	–	D M12 DIN 332	32 [1.5298]	58.5 [2.30]	–
GN	13.50 [0.531]	180 [7.0866]	215.00 [8.465]	–	D M12 DIN 332	32 [1.5298]	58.5 [2.30]	–
KK	13.50 [0.531]	114.3 [4.5000]	200 [7.874]	225 [8.858]	–	35 [1.3779]	79 [3.11]	38 [1.496]

Mounting Flange-Shaft	"M"	"N"	"P"	"R"	"S"	"T"	"U"	"V"	"W"
AC	–	–	41 [1.614]	10 [0.3937]	5.00 [0.197]	70 [2.756]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
AN	–	–	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
GC	–	–	35 [1.378]	108 [0.3937]	4 [0.157]	50 [1.969]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
GN	–	–	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
KK	10 [0.3937]	70 [2.756]	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]

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

Note 1: Dimensions are in mm [inches].

Note 2: Product designed in metric. English conversions provided for reference only.

\*Complete AKM series model nomenclature can be found on page 68.



# AKM8x Performance Data

## AKM8x Performance Data – Up to 640 Vdc bus voltage

Parameters		Tol	Symbol	Units	AKM82T	AKM83T	AKM84T
Max Rated DC Bus Voltage		Max	V <sub>bus</sub>	Vdc	640	640	640
Continuous Torque (Stall) for ΔT winding = 100°C ①②⑦⑧⑨		Nom	T <sub>CS</sub>	Nm	75	130	180
				lb-in	664	1151	1593
Continuous Current (Stall) for ΔT winding = 100°C ①②⑦⑧⑨		Nom	I <sub>CS</sub>	A <sub>RMS</sub>	48	62	67
Continuous Torque (Stall) for ΔT winding = 60°C ②		Nom	T <sub>CS</sub>	Nm	58.1	100	140
				lb-in	514	885	1239
Max Mechanical Speed ⑤		Nom	N <sub>max</sub>	rpm	3000	3000	3000
Peak Torque ①②		Nom	T <sub>p</sub>	Nm	210	456	668
				lb-in	1859	4036	5912
Peak Current		Nom	I <sub>p</sub>	A <sub>RMS</sub>	240	310	335
75 Vdc	Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-
				lb-in	-	-	-
	Rated Speed		N <sub>rtd</sub>	rpm	-	-	-
Rated Power (speed) ①②⑦⑧⑨			P <sub>rtd</sub>	kW	-	-	-
				Hp	-	-	-
160 Vdc	Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-
				lb-in	-	-	-
	Rated Speed		N <sub>rtd</sub>	rpm	-	-	-
Rated Power (speed) ①②⑦⑧⑨			P <sub>rtd</sub>	kW	-	-	-
				Hp	-	-	-
320 Vdc	Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	-	-	-
				lb-in	-	-	-
	Rated Speed		N <sub>rtd</sub>	rpm	-	-	-
Rated Power (speed) ①②⑦⑧⑨			P <sub>rtd</sub>	kW	-	-	-
				Hp	-	-	-
560 Vdc	Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	47.5	70	105
				lb-in	420	620	929
	Rated Speed		N <sub>rtd</sub>	rpm	2500	2200	1800
Rated Power (speed) ①②⑦⑧⑨			P <sub>rtd</sub>	kW	12.4	16.1	19.8
				Hp	16.65	21.62	26.58
640 Vdc	Rated Torque (speed) ①②⑦⑧⑨⑩		T <sub>rtd</sub>	Nm	38	60	93
				lb-in	336	531	823
	Rated Speed		N <sub>rtd</sub>	rpm	3000	2500	2000
Rated Power (speed) ①②⑦⑧⑨			P <sub>rtd</sub>	kW	11.9	15.7	19.5
				Hp	16.0	21.0	26.1

See following page for notes.

\*Complete AKM series model nomenclature can be found on page 68.

# AKM8x Performance Data

AKM 8 2 T - AN C N DA 00\*  
 Motor Series Frame Size Rotor Length Winding Shaft Flange Connection Brake Feedback Version

## AKM8x Performance Data – Up to 640 Vdc bus voltage (Continued)

Parameters	Tol	Symbol	Units	AKM82T	AKM83T	AKM84T
Torque Constant ①	±10%	K <sub>t</sub>	Nm/A <sub>rms</sub>	1.6	2.1	2.7
			lb-in/A <sub>rms</sub>	14	19	23.8
Back EMF Constant ⑥	±10%	K <sub>e</sub>	V/k <sub>r</sub> rpm	108	140	177
Motor Constant	Nom	K <sub>m</sub>	N-m/√W	4.31	6.94	9.15
			lb-in/√W	38.1	61.4	81.0
Resistance (line-line) ⑥	±10%	R <sub>m</sub>	ohm	0.092	0.061	0.058
Inductance (line-line)		L	mH	2.73	2.36	2.5
Inertia (includes Resolver feedback) ③		J <sub>m</sub>	kg-cm <sup>2</sup>	172	334	495
			lb-in-s <sup>2</sup>	0.15	0.29	0.43
Optional Brake Inertia (additional)		J <sub>m</sub>	kg-cm <sup>2</sup>	5.53	5.53	5.53
			lb-in-s <sup>2</sup>	4.90E-03	4.90E-03	4.90E-03
Weight		W	kg	49	73	97
			lb	107.8	160.6	213.4
Static Friction ①⑩		T <sub>f</sub>	Nm	1.7	1.83	2.34
			lb-in	15.05	16.20	20.71
Viscous Damping ①		K <sub>dv</sub>	Nm/k <sub>r</sub> rpm	0.35	0.95	1.6
			lb-in/k <sub>r</sub> rpm	3.10	8.41	14.16
Thermal Time Constant		TCT	minutes	71	94	116
Thermal Resistance		R <sub>thw-a</sub>	°C/W	0.225	0.203	0.183
Pole Pairs				5	5	5
Heat Sink Size				18"x18"x1/2" Aluminum Plate	18"x18"x1/2" Aluminum Plate	18"x18"x1/2" Aluminum Plate

### Notes:

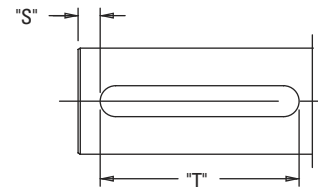
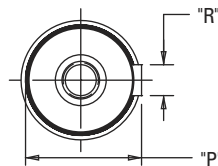
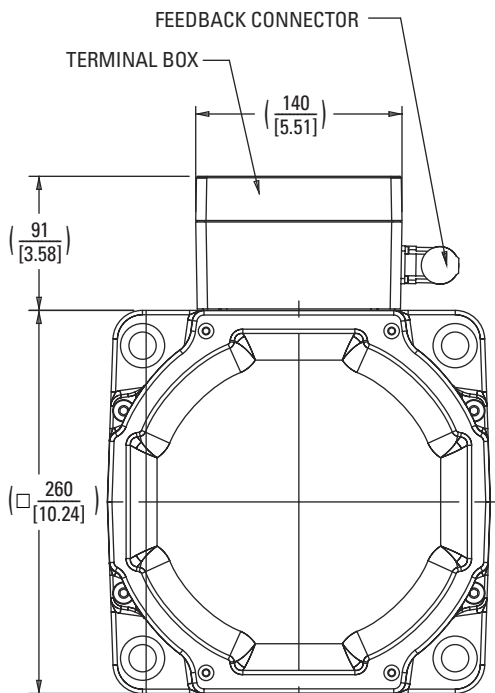
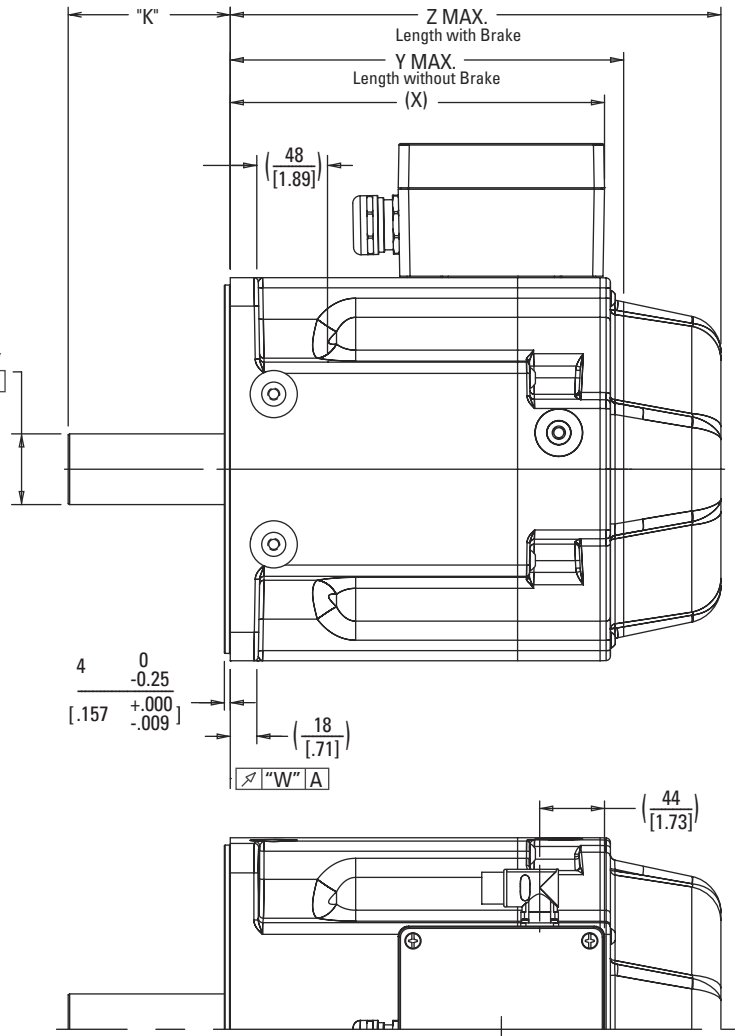
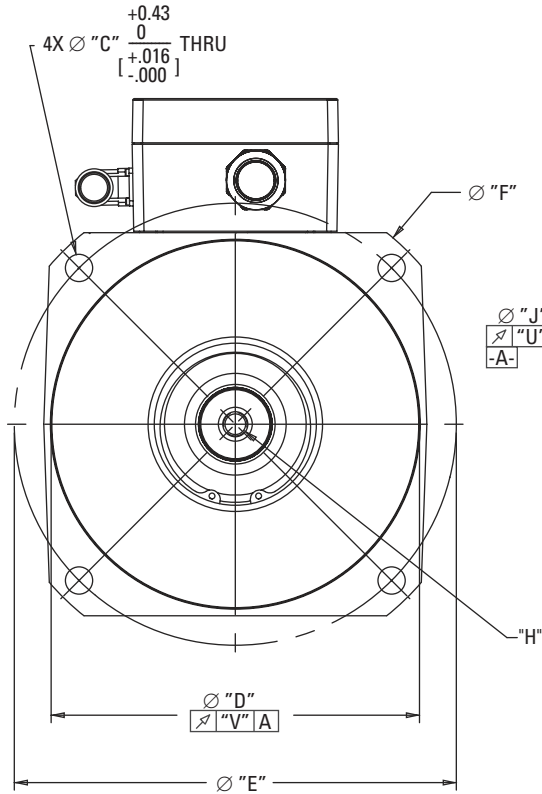
- ① Motor winding temperature rise, ΔT = 100°C, at 40°C ambient.
- ② All data referenced to sinusoidal commutation.
- ③ Add parking brake if applicable for total inertia.
- ④ Motor with standard heat sink.
- ⑤ May be limited at some values of V<sub>bus</sub>.
- ⑥ Measured at 25°C.
- ⑦ Brake option decreases continuous torque by 6Nm
- ⑧ Brake option increases weight by 9 kg
- ⑨ Non-Resolver feedback options reduce continuous torque ratings by:  
AKM82 = 9 Nm, AKM83 = 6 Nm, AKM84 = 18 Nm
- ⑩ Motor with non-resolver feedback and brake options reduce continuous torque ratings by:  
AKM82 = 17 Nm, AKM83 = 16 Nm, AKM84 = 28 Nm

Additional Notes: See system data beginning on page 12 for typical torque/speed performance.

Additional windings can be found through our online Motioneering sizing and selection software tool. See page 73 for more information.

# AKM8x Outline Drawings

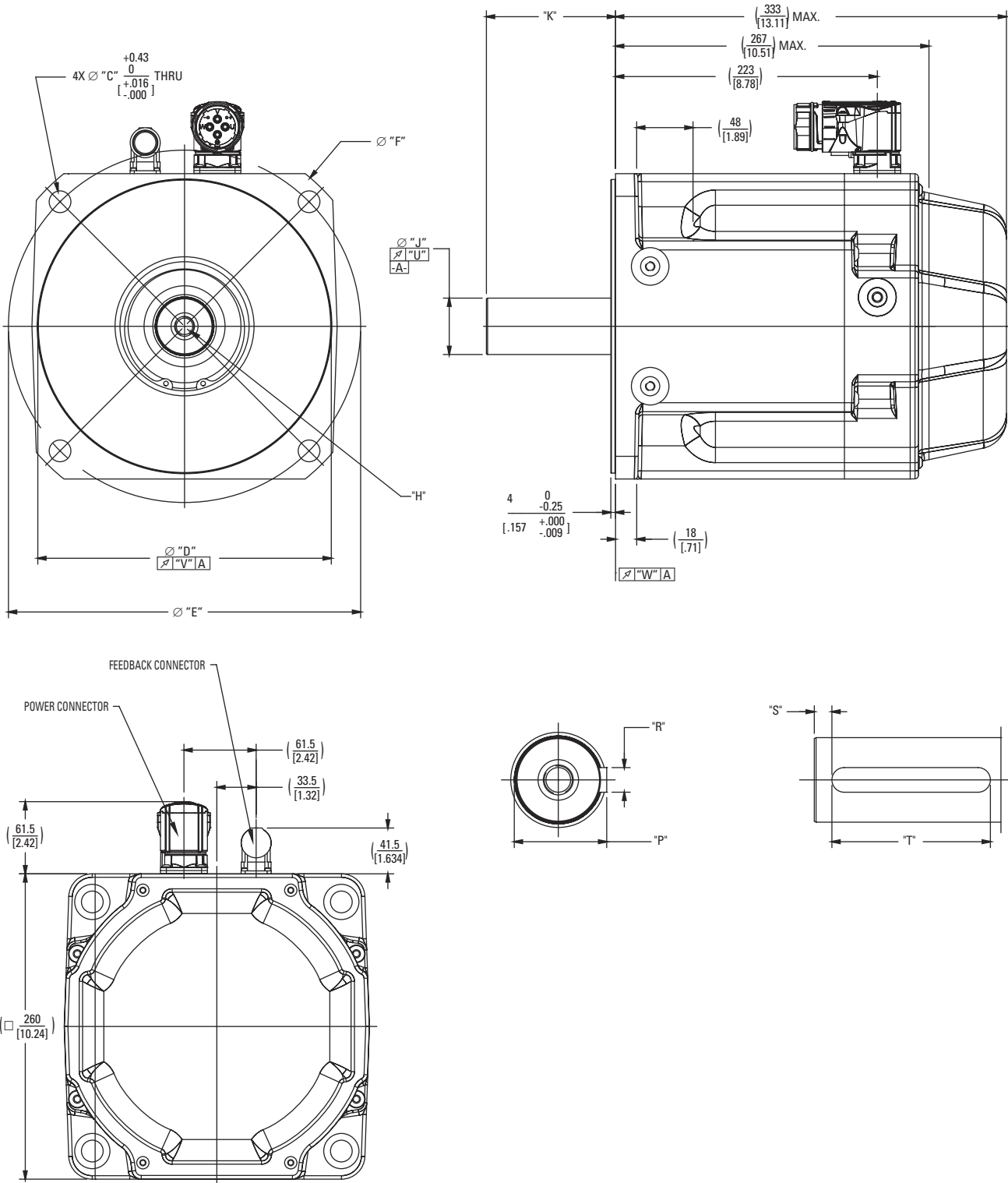
## AKM8x Frame with Terminal Box



Dimensional data for callouts are located on the page following the outline drawings.

AKM8X OUTLINE DRAWINGS

**AKM82 Frame with Rotatable IP65 Connectors**



Dimensional data for callouts are located on the following page.

# AKM8x Dimension Data

## AKM8x Dimension Data

Mounting Flange-Shaft	"C"	"D"	"E"	"F"	"H"	"J"	"K"	
AC	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	110 [4.33]	
AN	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	110 [4.33]	
CC	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	48 [1.8898]	110 [4.33]	
CN	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	48 [1.8898]	82 [3.228]	
HC	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	42 [1.6535]	82 [3.228]	
HN	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	42 [1.6535]	82 [3.228]	
GC	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	82 [3.228]	
GN	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	82 [3.228]	
REINFORCED BEARINGS	MC	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	110 [4.33]
	MN	18.5 [0.728]	250 [9.8425]	300 [11.811]	–	D M16 DIN 332	48 [1.8898]	110 [4.33]
	TC	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	48 [1.8898]	110 [4.33]
	TN	14.5 [0.571]	230 [9.055]	265 [10.433]	300 [11.811]	D M16 DIN 332	48 [1.8898]	110 [4.33]

Mounting Flange-Shaft	"P"	"R"	"S"	"T"	"U"	"V"	"W"	
AC	51.5 [2.028]	14 [0.5512]	10 [0.394]	90 [3.543]	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]	
AN	–	–	–	–	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]	
CC	51.5 [2.028]	14 [0.5512]	10 [0.394]	90 [3.543]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]	
CN	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]	
HC	45 [1.7772]	12 [0.5512]	8 [0.315]	63 [2.480]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]	
HN	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]	
GC	51.5 [2.028]	14 [0.5512]	8 [0.315]	63 [2.480]	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]	
GN	–	–	–	–	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]	
REINFORCED BEARINGS	MC	51.5 [2.028]	14 [0.5512]	10 [0.394]	90 [3.543]	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]
	MN	–	–	–	–	0.050 [0.0019]	0.125 [0.0049]	0.125 [0.0049]
	TC	51.5 [2.028]	14 [0.5512]	10 [0.394]	90 [3.543]	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]
	TN	–	–	–	–	0.050 [0.0019]	0.100 [0.0039]	0.100 [0.0039]

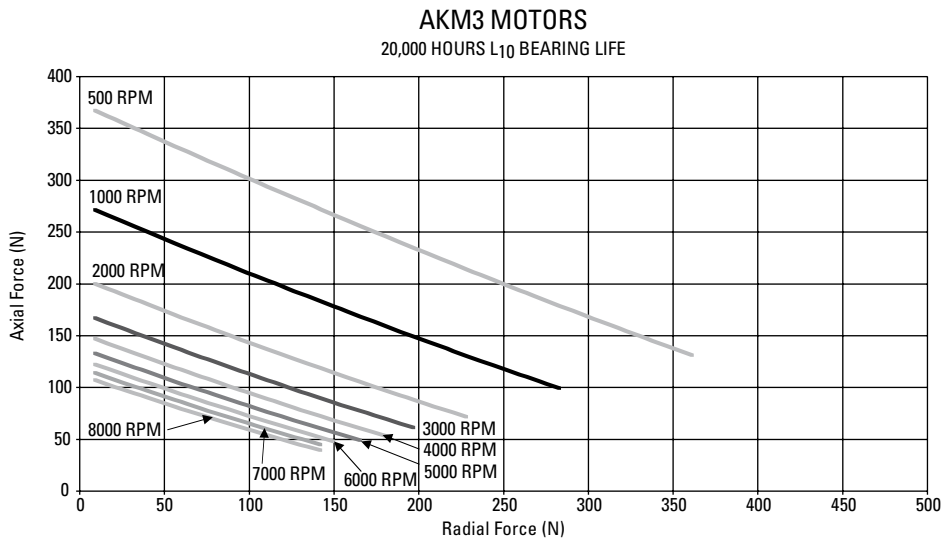
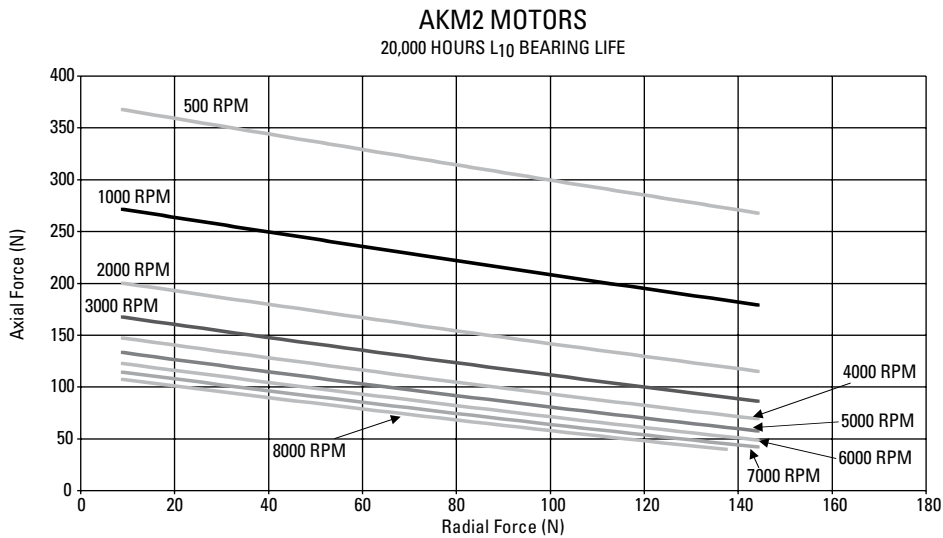
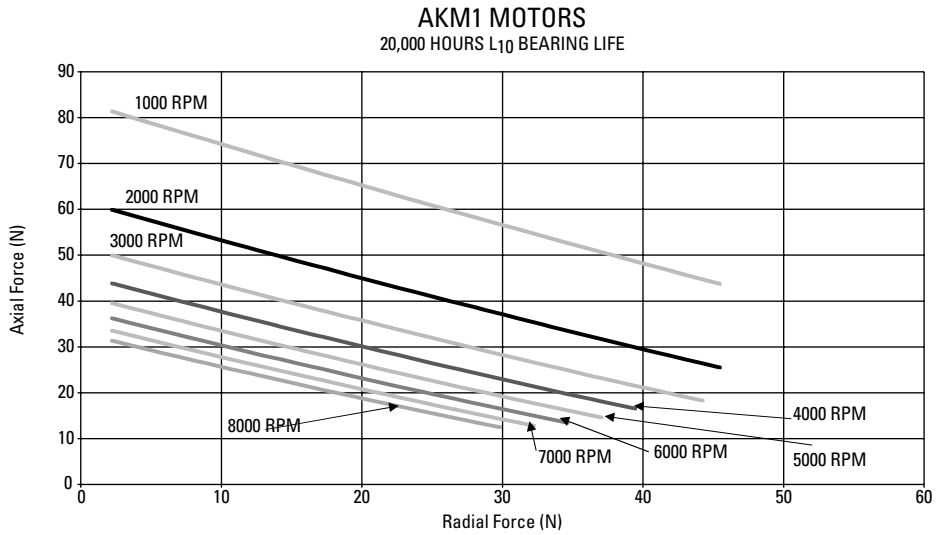
MODEL	(X)	Y MAX (W/O Brake)	Z MAX (W/ BRAKE)
AKM82 "H" Connector	223.0 [8.78]	267.0 [10.51]	333.0 [13.11]
AKM82 "T" TERMINAL BOX	255.0 [10.04]	267.0 [10.51]	333.0 [13.11]
AKM83 "T" TERMINAL BOX	335.5 [13.21]	347.5 [13.68]	413.5 [16.25]
AKM84 "T" TERMINAL BOX	416.0 [16.38]	428.0 [16.85]	494.0 [19.45]

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

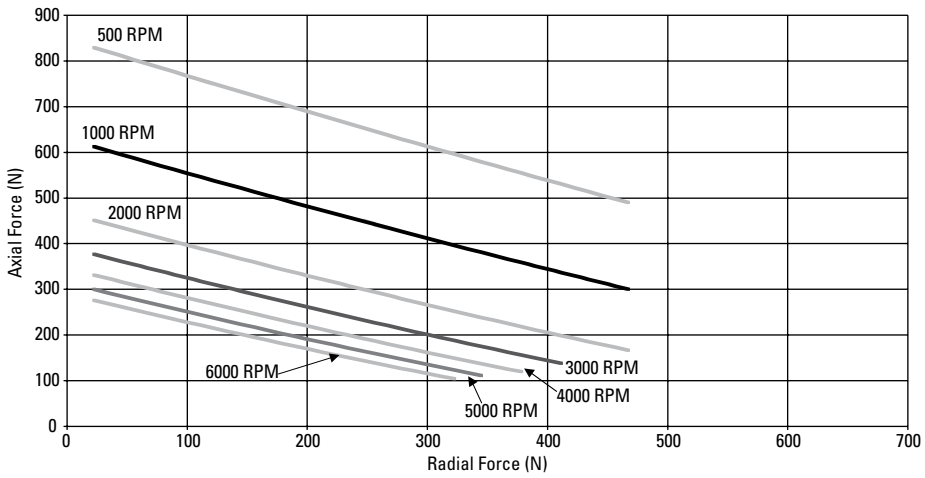
# Notes

A large grid of graph paper for taking notes, consisting of 20 columns and 30 rows of small squares. The grid is divided into three vertical sections by two vertical lines: a left section of 7 columns, a middle section of 7 columns, and a right section of 6 columns.

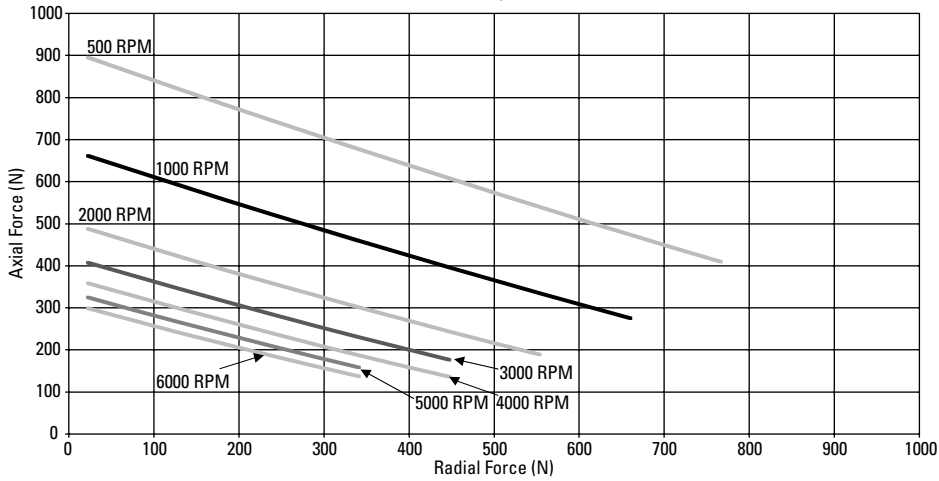
# L10 Bearing Fatigue and Shaft Loading



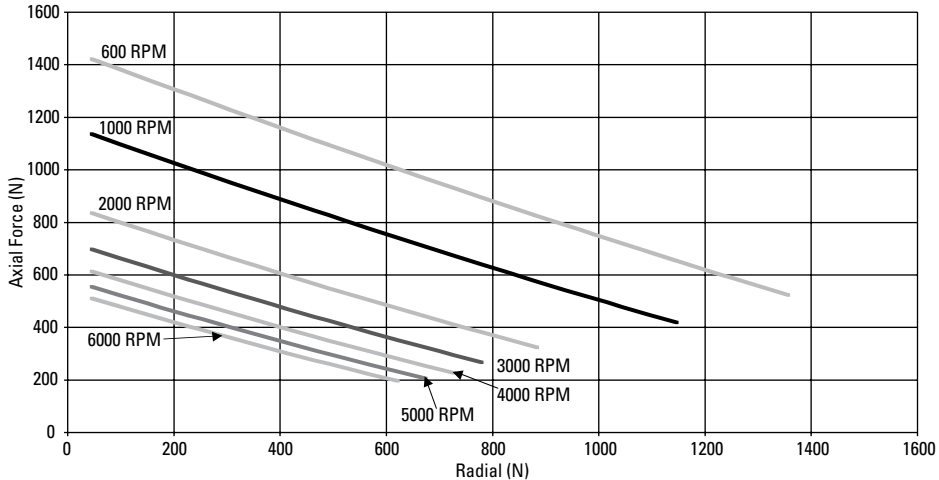
**AKM4 MOTORS**  
20,000 HOURS L<sub>10</sub> BEARING LIFE



**AKM5 MOTORS**  
20,000 HOURS L<sub>10</sub> BEARING LIFE



**AKM6 MOTORS**  
20,000 HOURS L<sub>10</sub> BEARING LIFE



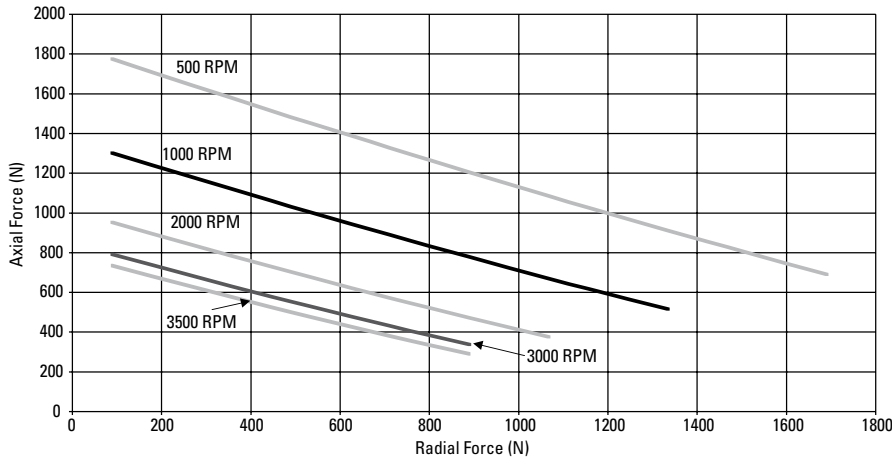


# L10 Bearing Fatigue and Shaft Loading

L10 BEARING FATIGUE LIFE AND SHAFT LOADING

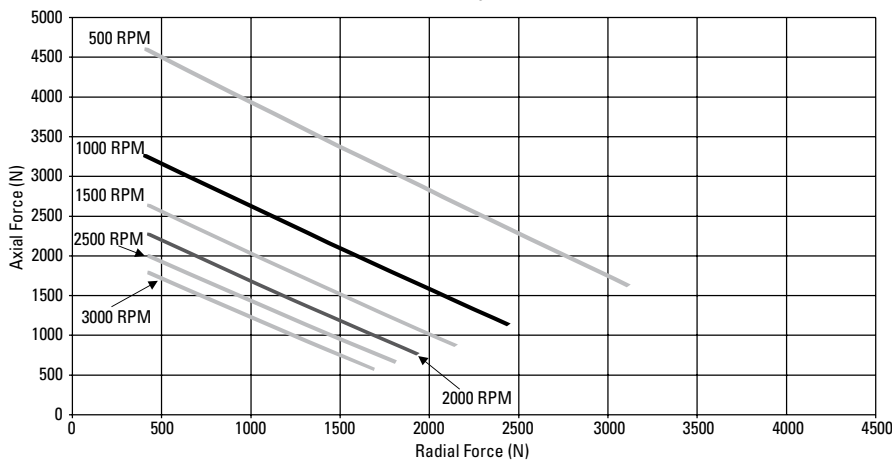
## AKM7 MOTORS

20,000 HOURS L<sub>10</sub> BEARING LIFE



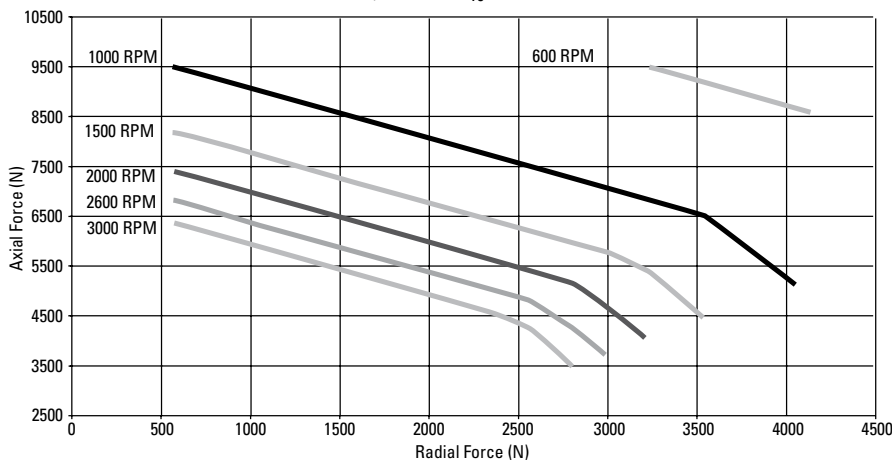
## AKM8 MOTORS

20,000 HOURS L<sub>10</sub> BEARING LIFE



## AKM83 & 84 MOTOR WITH REINFORCED BEARING

20,000 HOURS L<sub>10</sub> 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
AKM8	2752	4750

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 240 N max. radial force.
3. Infinite life with 99% reliability.
4. Safety factor = 2.

## Teflon Shaft Seals

There is a normal break-in period for our Teflon® shaft seals. Best conditions during the break-in period would be at the operational temperature and speed that would be typical for the application.

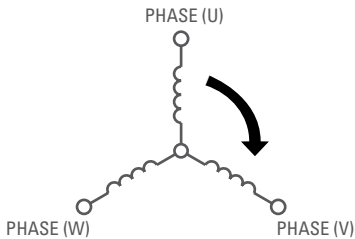
During the break-in period, some “shedding” of Teflon material is normal. The debris is not a sign of seal deterioration or failure. The material “shed” should be reduced with usage.

Typically, a few hours at operational speed is enough to break-in the shaft seal.

# Feedback Options

## Phasing Diagram - All Motors

### Motor Winding Configuration



#### General notes:

- 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.
- 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.
- Optional KTY84-130 Nominal Resistance at 25°C, 603 ohms.
- Optional KTY83-110 Nominal Resistance at 25°C, 1000 ohms.
- 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.
- Standard outline drawings showing mounting dimensions and standard winding information are available on our website or by calling the Kollmorgen Customer Support at 1-540-633-3545, or through email at support@kollmorgen.com.

## Feedback Summary for AKM Servo Motor with AKD Servo Drive

Feedback Device/ (Motor designation)	Plug & Play, Motor ID <sup>3</sup>	AKM Models	Device Resolution Cycles or Lines/rev	Resolution after AKD Interpolation <sup>4</sup> : counts (arc-min)	Accuracy: Arc-min (±)
Comcoder (1-)	N	AKM1-8	1024	4096 (5.27)	5.27
Comcoder (2-)	N	AKM1-8	2048	8192 (2.64)	2.64
Resolver (R-)	N	AKM1	1	65536 (0.330)	15
		AKM2-8			8
SFD (C-)	Y	AKM1	16,777,216 (0.00129 arc-min)	N/A	16
		AKM2-8			9
Endat 2.1 <sup>1</sup> (DA)	Y	AKM2-4	512	134,217,728 (0.000161)	1.0
		AKM5-8	2048		0.333
Endat 2.1 Multi-turn <sup>1,2</sup> (DB)	Y	AKM2-4	512	134,217,728 (0.000161)	1.0
		AKM5-8	2048		0.333
BiSS <sup>1</sup> (AA)	Y	AKM2-8	2048	134,217,728 (0.000161)	0.60
BiSS Multi-turn <sup>1,2</sup> (AB)	Y	AKM2-8	2048	134,217,728 (0.000161)	0.60
Inductive enc. <sup>1</sup> (LA)	Y	AKM2,3	16	1,048,576 (0.0206)	8
		AKM4-7	32	2,097,152 (0.0103)	4.66
Inductive enc. Multi-turn <sup>1,2</sup> (LB)	Y	AKM2,3	16	1,048,576 (0.0206)	8
		AKM4-7	32	2,097,152 (0.0103)	4.66

Note 1: Not available for AKM1.

Note 2: Provides 4096 turns of absolute positioning.

Note 3: These feedback devices include electronic motor nameplate data allowing plug-and-play commissioning, eliminating the need for drive parameter set-up and servo loop tuning in most applications.

Note 4: AKD interpolation for sinusoidal feedback devices is 2<sup>16</sup>, however the resulting usable resolution for positioning may be much less for very high resolution systems.

# Servo Motor Feedback Combinations

## AKM Family of Servo Motors with Smart Feedback Device (SFD)

The SFD Feedback communicates with the drive over a four-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:  $< \pm 0.75$  arc-min electrical + sensor error  
 Size 10 sensor  $\pm 16$  arc-min net (AKM 1)  
 Size 15 sensor  $\pm 9$  arc-min net (AKM 2,3,4)  
 Size 21 sensor  $\pm 9$  arc-min net (AKM 5,6,7)  
 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)  
 Size 21 sensor  $< 1.5\%$  p-p net (AKM 5,6,7)  
 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:  $5.0 \text{ V} \pm 0.25 \text{ V} (\pm 5\%)$   
 Supply at SFD in motor: 4.25 V to 5.25 V  
 Nominal Supply Current: 120 mA  
 Worst Case Supply: 150 mA  
 Cable Resistance: +5V, Rtn:  $< 3.3 \text{ Ohm net}$

### Environmental:

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

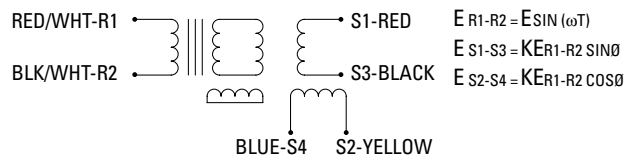
## Resolver (Feedback)

Resolver Data	Units	AKM 1	AKM 2, 3, 4	AKM 5, 6, 7, 8
		1 Speed	1 Speed	1 Speed
Input Voltage	$V_{\text{RMS}}$	7.0	7.0	7.0
	k Hz	10	10	10
Input Current Max.	mA	30	50	50
Transformation Ratio	10%	0.5	0.5	0.5
Null Voltage	$mV_{\text{RMS}}$	50	30	30
Max. Error (pk-pk)	MINS.	30	18	18
Phase Shift	Degrees	-9	0	0
Operating Temperature	°C	-55° to 155°	-55° to 155°	-55° to 155°
Rotor Inertia Max.	kg-cm <sup>2</sup>	0.002	0.046	0.497

### Resolver Alignment

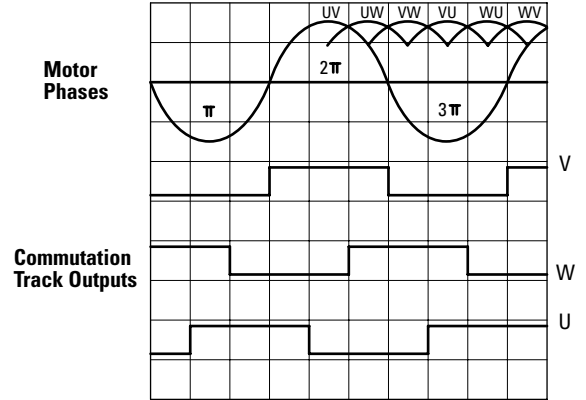
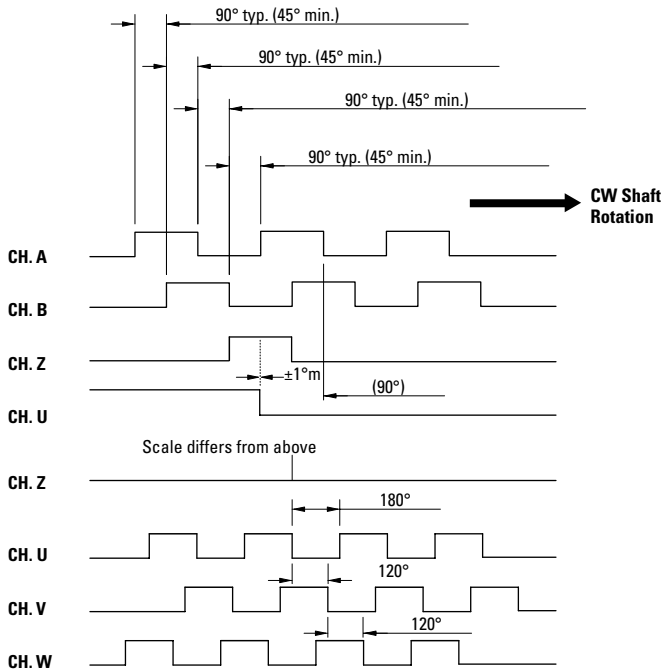
With positive DC current into phase W and out of phase V (U floats) the resolver is aligned to electrical  $\pm 5$  counts. ie. Voltage S1-S3 set to null voltage S2-S4 max in phase with reference (R1-R2).

### Resolver Winding Configuration



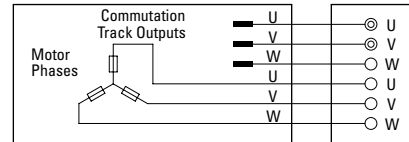
## Commutating Encoder Option

### Commutating Encoder



Max. Misalignment between rising edge of commutation track V & zero crossing of back EMF UV  $\leq 5^\circ$  electrical.

#### Motor Connections



Output Comm: Open Collector W 2.2 k OHMS  
External Pull Ups  
(SINK 8 mA MAX.)

Parameter	Units	1- (AKM1-8)	2- (AKM1-8)	ED (AKM2-8)	EE (AKM2-8)	EF (AKM2-4)	EF (AKM5-8)	EG (AKM2-8)	EM (AKM2-8)	EH (AKM2-8)	EN (AKM5-8)	EJ (AKM5-8)
Input Voltage	Vdc $\pm 10\%$	5										
Output Data		26LS31 Diff. Line Driver. Sink/Source 40mA Max										
Line Count		1,024	2,048	500	1,000	2,000	2,000	2,500	4,096	5,000	8,192	10,000
Frequency Response	KHz	200	200	200	200	200	200	200	500	500	1000	1000
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	$^\circ$ e MIN.	45										
Index to U Comm Channel		$\pm 1^\circ$ m Index Center To U Falling Edge										
Index Pulse Width		Gated With B Low										
Incremental Channel Accuracy		$\pm 1$ Arc Min. (AKM2-8), $\pm 2.5$ Arc Min. (AKM1) Max. Edge to Edge										
Max. Acceleration	Rad/s <sup>2</sup>	100,000										
Operating Temperature	$^\circ$ C	0-120										
Storage Temperature	$^\circ$ C	0-120			-40 - 120							

	Type	AKM1	AKM2	AKM3	AKM4	AKM 5, 6, 7, 8
Commutating Channel	All Models	6 Pole 60°m $\pm 6$ Min.	6 Pole 60°m $\pm 6$ Min.	8 Pole 45°m $\pm 6$ Min.	10 Pole 36°m $\pm 6$ Min.	10 Pole 36°m $\pm 6$ Min.
Moment of Inertia (kg-cm <sup>2</sup> )	1-2- All Ex Models	0.0016 NA	0.0048 0.0048	0.0048 0.0048	0.0048 0.0048	0.0275 0.0275

# Servo Motor Feedback Combinations

## Absolute Sine Encoder Options

### Encoder Alignment

With positive DC current into phase W and out of phase V (U floats) the encoder is aligned to  $\pm 1$  electrical degree<sup>1</sup>.

### EnDat Optical

Type		Single-Turn "DA"		Multi-Turn "DB"	
Frame Size		AKM 2, 3, 4	AKM 5, 6, 7, 8	AKM 2, 3, 4	AKM 5, 6, 7, 8
Cycles Per Revolution		512	2048	512	2048
Input Voltage	Vdc $\pm 5\%$	5	5	5	5
Current Consumption	mA MAX.	160	150	200	250
Operating Temperature	$^{\circ}\text{C}$ MIN/MAX	-20/115	-20/115	-20/115	-20/115
Inertia	kg-cm <sup>2</sup>	0.040	0.260	0.040	0.260
Output Interface		HEIDENHAIN EnDat			
Type		ECN1113	ECN1313	EQN1125	EQN1325

### EnDat Inductive

Type		Single-Turn "LA"		Multi-Turn "LB"	
Frame Size		AKM 2, 3	AKM 4, 5, 6, 7	AKM 2, 3	AKM 4, 5, 6, 7
Cycles Per Revolution		16	32	16	32
Input Voltage	Vdc $\pm 5\%$	5	5	5	5
Current Consumption	mA MAX.	160	170	190	170
Operating Temperature	$^{\circ}\text{C}$ MIN/MAX	-20/115	-20/115	-20/115	-20/115
Inertia	kg-cm <sup>2</sup>	0.0076	0.022	0.0076	0.022
Output Interface		HEIDENHAIN EnDat			
Type		ECl 1118	ECl1319	EQI 1130	EQI1331

### BiSS Optical

Type		Single-Turn "AA"		Multi-Turn "AB"	
Frame Size		AKM 2, 3, 4	AKM 5, 6, 7, 8	AKM 2, 3, 4	AKM 5, 6, 7, 8
Cycles Per Revolution		2048	2048	2048	2048
Input Voltage	Vdc $\pm 5\%$	5	5	5	5
Current Consumption	mA MAX.	45	70	85	100
Operating Temperature	$^{\circ}\text{C}$ MIN/MAX	-20/115	-20/115	-20/115	-20/115
Inertia	kg-cm <sup>2</sup>	0.025	0.038	0.025	0.038
Output Interface		BiSS			
Type		AD36	AD58	AD36	AD58

Note 1: EnDat Inductive is aligned to  $\pm 3$  electrical degrees

# Brake Option

## 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 is not intended for dynamic braking. There should be absolutely no motion of the rotor when power is removed from the brake coil.

### AKM Motor Brake Specifications

Motor Family	Minimum Static Torque @120°C		Weight		Power Consumption @24V, 20°C Watts ±7%	Current @24V, 20°C ADC	Inertia		Closing Time (engage) msec	Opening Time (release) msec	Backlash	
	Nm	lb-in	Kg	lb			kg-cm <sup>2</sup>	lb-in-sec <sup>2</sup>			Maximum deg.	Typical deg.
AKM2	1.42	12.6	0.27	0.59	8.4	0.35	0.011	0.97E-05	36	35	1.01	0.46
AKM3	2.5	22.1	0.35	0.77	10.1	0.42	0.011	0.97E-05	20	50	1.01	0.46
AKM4	5.3	46.9	0.63	1.39	12.8	0.53	0.068	6.02E-05	30	75	0.81	0.37
AKM5	14.5	128	1.1	2.42	19.5	0.82	0.173	1.53E-04	30	115	0.71	0.31
AKM6	25	221	2	4.4	25.7	1.07	0.605	5.35E-04	40	155	0.51	0.24
AKM7	53	469	2.9	6.38	35.6	1.48	1.64	1.46E-03	70	170	0.44	0.20
AKM8	150	1330	8	17.5	49	2.04	5.53	4.90E-03	100	300	0.44	0.20

Note 1: Contamination of the motor internal compartment by oil or other foreign materials will result in failure of the brake. Check the suitability of motor sealing for the working environment.

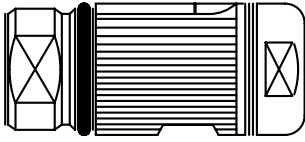
Note 2: Operating Voltage: 24 Vdc ± 10%.

Note 3: Maximum backlash is calculated using worst-case tolerancing, and typical backlash is calculated using statistical tolerancing.

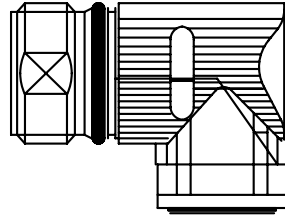
# Servo Motor Connector Options

## B, C, G, H, & T Power Connectors

### B, C- Connector

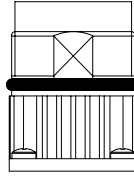


Cable Option (AKM 1 & 2 Only)  
 Connector Part Number:  
 BKUA-199-NN-00-11-0035-000  
 (For AKM 1 & 2)



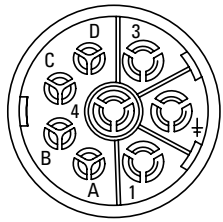
Motor Mounted Option  
 Connector Part Number:  
 BEDC-089-NN-00-00-0005-000

### G- Connector



Motor Mounted Option  
 Connector Part Number:  
 BEDC-089-NN-00-00-0011-000  
 (AKM 2, 3, 4, 5, 6 & 7)

### Power Connector (View Facing Front)



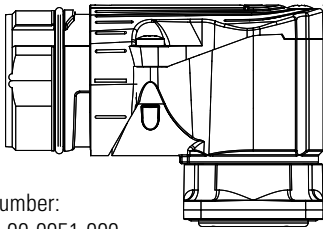
Pin	Function	Color
1	U	Blue
±	PE	Grn/Yel
3	W	Violet
4	V	Brown
A	Brake +	Black
B	Brake -	Black
C	N/C	
D	N/C	

Shield Connected to Motor  
 Ground Internal to Motor  
 (For AKM 1 & 2)

#### Suggested Mating Connector

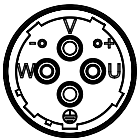
Intercontec  
 BSTA-108-NN-00-08-0036-000

### H- Connector



Connector Part Number:  
 CEDE-270-NN-00-00-0051-000

### Power Connector (View Facing Front)



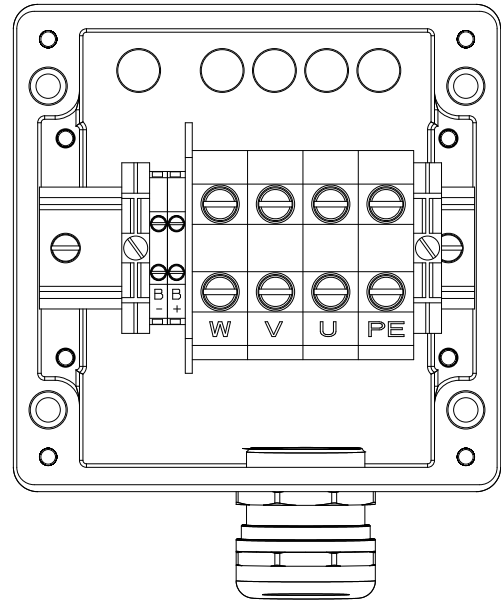
Pin	Function	Color
U	U	Blue
±	PE	Grn/Yel
W	W	Violet
V	V	Brown
+	Brake +	Black
-	Brake -	Black

#### Suggested Mating Connector

Intercontec  
 CSTA-263-NN-00-45-0001-000

Shield Connected to Motor  
 Ground Internal to Motor

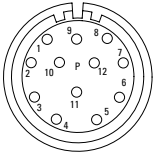
### T- Connector



Terminal Box AKM8 Only

## B, C, G, H, & T Feedback Connectors

### 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 2, 3, 4, 5, 6, 7, & 8)

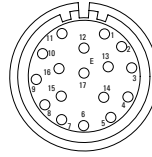
Pin	Function	Color
1	SFD +5V	Red
2	SFD +5V RTN	Black
3	SFD COM-	Yellow
4	SFD COM+	Blue
5	SFD COM Shield (AKM 1, 2)	
6	N/C	
7	N/C	
8	N/C	
9	N/C	
10	N/C	
11	N/C	
12	N/C	

Shield is Not Connected at Motor End

#### Suggested Mating Connector

Intercontec  
ASTA-021-NN-00-10-0035-000

### Commutating Encoder (View Facing Front)



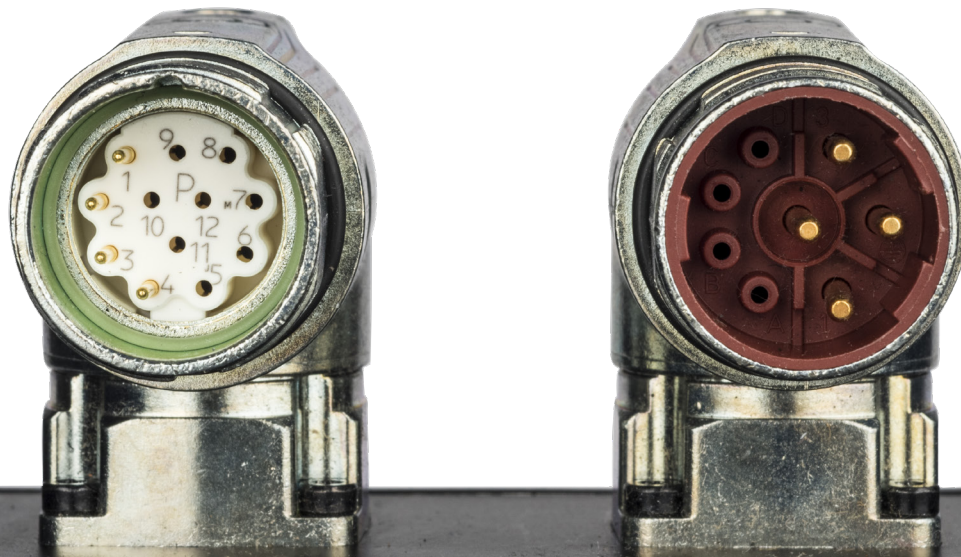
Connector Part Number:  
AKUA-034-NN-00-09-0035-000 (For AKM 1 & 2)  
AEDC-113-NN-00-00-0012-000 (For AKM 2, 3, 4, 5, 6, & 7)

Pin	Function	Color
1	B	Green
2	$\bar{B}$	Grn/Blk
3	A	Blue
4	$\bar{A}$	Blue/Blk
5	Z	Violet
6	$\bar{Z}$	Violet/Blk
7	Gnd	Black
8	Thermal Sensor +	Orange
9	Thermal Sensor -	Orange/White
10	Vcc	Red
11	N/C	
12	N/C	
13	N/C	
14	N/C	
15	U	Brown
16	V	Grey
17	W	White

Shield is Not Connected at Motor End  
On motor mounted connectors, the thermal sensor lead colors are (+) Blue, (-) Black.

#### Suggested Mating Connector

Intercontec  
ASTA-035-NN-00-10-0035-000

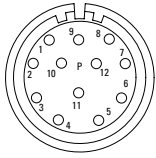




# Servo Motor Connector Options

## B, C, G, H, & T Feedback Connectors

### 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 2, 3, 4, 5, 6, 7, & 8)

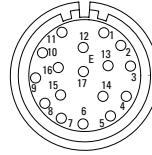
Pin	Function	Color
1	N/C	
2	Thermal Sensor +	Orange
3	S4, COS-	Blue
4	S3, SIN-	Black
5	R2, REF-	Blk/Wht
6	Thermal Sensor -	Orange/White
7	S2, COS+	Yellow
8	S1, SIN+	Red
9	R1, REF+	Red/Wht
10	N/C	
11	N/C	
12	N/C	

Shield is Not Connected at Motor End  
On motor mounted connectors, the thermal sensor lead colors are (+) Blue, (-) Black.

#### Suggested Mating Connector

Intercontec  
ASTA-021-NN-00-10-0035-000

### “DA” & “DB” Absolute Encoder (View Facing Front) “LA” & “LB” Absolute Encoder (Inductive)



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 & 8)

Pin	Function	Color	
		AKM2	AKM3, 4, 5, 6, 7, 8 (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	Data	Pink	Pink
14	Thermal Sensor-	Brown	Black
15	Clock	Yellow	Yellow
16	N/C		
17	N/C		

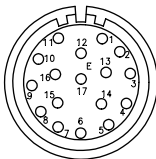
Shield is Not Connected at Motor End

#### Suggested Mating Connector

Intercontec  
ASTA-035-NN-00-10-0035-000

Option “DA” = Single-Turn Absolute  
Option “DB” = Multi-Turn Absolute

### “AA” & “AB” Absolute Encoder (View Facing Front)



Connector Part Number:  
AEDC-113-NN-00-00-0012-000 (For AKM 3, 4, 5, 6, & 7)

Pin	Function	Color
1	B-	Red/Blk
2	Gnd	Wht/Blk
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	Data	Pink
14	Thermal Sensor-	Brown
15	Clock	Yellow
16	N/C	
17	N/C	

Shield is Not Connected at Motor End

#### Suggested Mating Connector

Intercontec  
ASTA-035-NN-00-10-0035-000

### Mating Connector Kits

(For Use On Motors With “C & G” Connectors Only)

Connector Part Number: BEDC-089-NN-00-00-0005-000

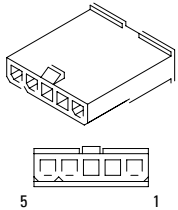
Resolver	CKT-T1A-SRE	CKT-T1B-SRE
Encoder	CKT-T1A-SCE	CKT-T1B-SCE

Mating Connector Kits Include Both  
Power and Feedback Connectors.

## "M" Connector Options

(AKM 1, 2, 3 & 4 Only) If additional dimensions or connectors are required, contact Kollmorgen Customer Support.

### Power Connector (Non Brake, View Facing Front)



Connector Part Number: Molex 39-01-4056 (Eng No. 5559-05P3)

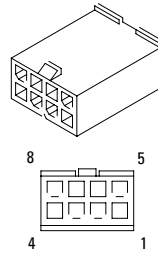
Pin	Function	Color
1	U	Blue
2	V	Brown
3	W	Violet
4	Gnd	Grn/Yel
5	Shield	

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)

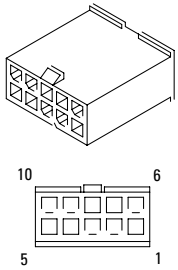
Pin	Function	Color
1	U	Blue
2	V	Brown
3	W	Violet
4	Gnd	Grn/Yel
5	Shield	
6	Brake+	Black
7	Brake-	Black
8	N/C	

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

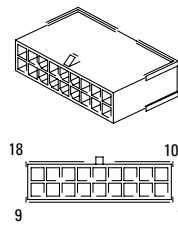
Pin	Function	Color
1	SFD +5V	Red
2	SFD +5V RTN	Black
3	SFD COM-	Yellow
4	SFD COM+	Blue
5	SFD COM Shield	
6	N/C	
7	N/C	
8	N/C	
9	N/C	
10	N/C	

Shield is Not Connected at Motor End

#### Suggested Mating Connector

Molex 43025-1000

### Commutating Encoder (View Facing Front)



Connector Part Number: Molex 43020-1801

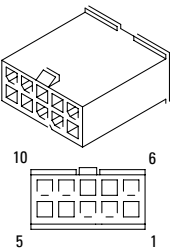
Pin	Function	Color
1	B	Green
2	$\bar{B}$	Grn/Blk
3	A	Blue
4	$\bar{A}$	Blue/Blk
5	Z	Violet
6	$\bar{Z}$	Violet/Blk
7	Gnd	Black
8	Thermal Sensor +	Orange
9	Thermal Sensor -	Orange/White
10	Vcc	Red
11	N/C	
12	N/C	
13	N/C	
14	N/C	
15	U	Brown
16	V	Grey
17	W	White
18	Shield	

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 +	Orange
3	S4, COS-	Blue
4	S3, SIN-	Black
5	R2, REF-	Blk/Wht
6	Thermal Sensor -	Orange/White
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

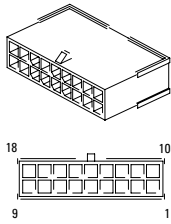
# Servo Motor Connector Options

## "M" Connector Options

(AKM 1, 2, 3 & 4 Only) If additional dimensions or connectors are required, contact Kollmorgen Customer Support.

"DA" & "DB" Absolute Encoder (View Facing Front)

"LA" & "LB" Absolute Encoder (View Facing Front)



Connector Part Number: Molex 43020-1801

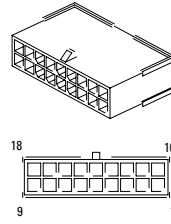
Pin	Function	Color
1	B-	Red/Blk
2	Gnd	Wht/Blk
3	A-	Yel/Blk
4	Vcc (5Vdc)	Brn/Grn
5	Data	Gray
6	N/C	
7	Thermal Sensor+	Green
8	Clock	Violet
9	B+	Blu/Blk
10	Un Sense (Common)	White
11	A+	Grn/Blk
12	Up Sense (VCC)	Blue
13	Data	Pink
14	Thermal Sensor-	Brown
15	Clock	Yellow
16	N/C	
17	N/C	
18	Shield	

Shield is Not Connected at Motor End

### Suggested Mating Connector

Molex 43025-1800

"AA" & "AB" Absolute Encoder (View Facing Front)



Connector Part Number: Molex 43020-1801

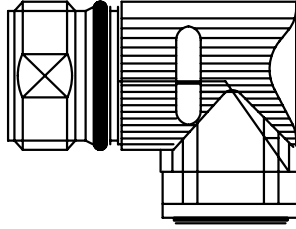
Pin	Function	Color
1	B-	Red/Blk
2	Gnd	Wht/Blk
3	A-	Yel/Blk
4	Vcc (5Vdc)	Brn/Grn
5	Data	Gray
6	N/C	
7	Thermal Sensor+	Green
8	Clock	Violet
9	B+	Blu/Blk
10	Un Sense (Common)	White
11	A+	Grn/Blk
12	Up Sense (VCC)	Blue
13	Data	Pink
14	Thermal Sensor-	Brown
15	Clock	Yellow
16	N/C	
17	N/C	
18	N/C	

Shield is Not Connected at Motor End

### Suggested Mating Connector

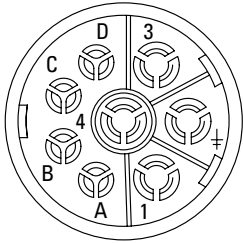
Molex 43025-1800

## "D" Connector Options



Motor Mounted Option (AKM 2, 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

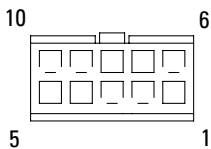
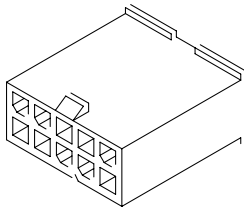
#### Suggested Mating Connector

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
±	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

# ▶ AKD<sup>®</sup> Servo Drive

**Our AKD series is a complete range of Ethernet-based servo drives that are fast, feature-rich, flexible and integrate quickly and easily into any application.** AKD ensures plug-and-play commissioning for instant, seamless access to everything in your machine. And, no matter what your application demands, AKD offers industry-leading servo performance, communication options, and power levels, all in a smaller footprint.

This robust, technologically advanced family of drives delivers optimized performance when paired with our best-in-class components, producing higher quality results at greater speeds and more uptime. With Kollmorgen servo components, we can help you increase your machine's overall equipment effectiveness (OEE) by 50%.

## The Benefits of AKD Servo Drive

- Optimized Performance in Seconds
  - Auto-tuning is one of the best and fastest in the industry
  - Automatically adjusts all gains, including observers
  - Immediate and adaptive response to dynamic loads
  - Precise control of all motor types
  - Compensation for stiff and compliant transmission and couplings
- Greater Throughput and Accuracy
  - Up to 27-bit-resolution feedback yields unmatched precision and excellent repeatability
  - Very fast settling times result from a powerful dual processor system that executes industry-leading and patent pending servo algorithms with high resolution
  - Advanced servo techniques such as high-order observer and bi-quad filters yield industry-leading machine performance
  - Highest bandwidth torque-and-velocity loops. Fastest digital current loop in the market
- Easy-to-use Graphical User Interface (GUI) for Faster Commissioning and Troubleshooting
  - Six-channel real-time software oscilloscope commissions and diagnoses quickly
  - Multi-function Bode Plot allows users to quickly evaluate performance
  - Auto-complete of programmable commands saves looking up parameter names
  - One-click capture and sharing of program plots and parameter settings allow you to send machine performance data instantly
  - Widest range of programming options in the industry
- Flexible and Scalable to Meet any Application
  - 3 to 48 Arms continuous current; 9 to 96 Arms peak
  - Very high power density enables an extremely small package
  - True plug-and-play with all standard Kollmorgen servo motors and actuators
  - Supports a variety of single and multi-turn feedback devices—Smart Feedback Device (SFD), EnDat2.2, 01, BiSS, analog Sine/Cos encoder, incremental encoder, HIPERFACE®, and resolver
  - Tightly integrated Ethernet motion buses without the need to add large hardware: EtherCAT®, SynqNet®, Modbus® TCP, EtherNet/IP™, PROFINET® RT, SERCOS® III, and CANopen®
  - Scalable programmability from base torque-and-velocity through multi-axis master

# AKD<sup>®</sup> Servo Drive

The AKD servo drive delivers cutting-edge technology and performance with one of the most compact footprints in the industry. These feature-rich drives provide a solution for nearly any application, from basic torque-and-velocity applications, to indexing, to multi-axis programmable motion with embedded Kollmorgen Automation Suite™. The versatile AKD sets the standard for power density and performance.

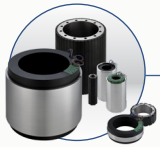
AKD<sup>®</sup> SERVO DRIVE



AKMH<sup>™</sup> Hygienic Stainless Steel Motors



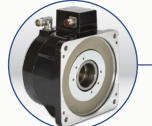
AKM<sup>®</sup> 2G Servo Motors



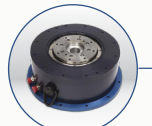
Frameless Brushless Direct Drive Motors



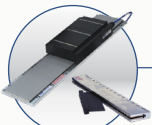
AKD<sup>®</sup>-N Decentralized Servo Drive



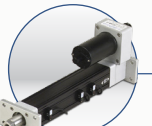
Cartridge DDR<sup>®</sup> Motors



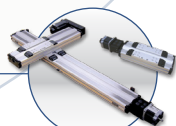
Housed DDR<sup>®</sup> Motors



Direct Drive Linear Motors



Linear Actuators



Multi-Axis Precision Tables



AKD<sup>®</sup> Servo Drive



Control of motors with AKD<sup>®</sup> PDMM programmable multi-axis master

### Best-in-Class Components

AKD works seamlessly with Kollmorgen motors and actuators—well-known for quality, reliability, and performance.



## General Specifications

120 / 240 Vac 1 & 3 Phase (85 -265 V)	Continuous Current (Arms)	Peak Current (Arms)	Drive Continuous Output Power Capacity (Watts)	Internal Regen (Watts) (Ohms)		Height mm (in)	Width mm (in)	Depth mm (in)	Depth with Cable Bend Radius mm (in)
AKD-x00306	3	9	1100	0	0	168 (6.61)	59 (2.32)	156 (6.14)	184 (7.24)
AKD-x00606	6	18	2000	0	0	168 (6.61)	59 (2.32)	156 (6.14)	184 (7.24)
AKD-x01206	12	30	4000	100	15	196 (7.72)	78 (3.07)	187 (7.36)	215 (8.46)
AKD-x02406	24	48	8000	200	8	247 (9.72)	100 (3.94)	228 (8.98)	265 (10.43)
240/480 Vac 3 Phase (187-528 V)	Continuous Current (Arms)	Peak Current (Arms)	Drive Continuous Output Power Capacity (Watts)	Internal Regen (Watts) (Ohms)		Height mm (in)	Width mm (in)	Depth mm (in)	Depth with Cable Bend Radius mm (in)
AKD-x00307	3	9	2000	100	33	256 (10.08)	70 (2.76)	185 (7.28)	221 (8.70)
AKD-x00607	6	18	4000	100	33	256 (10.08)	70 (2.76)	185 (7.28)	221 (8.70)
AKD-x01207	12	30	8000	100	33	256 (10.08)	70 (2.76)	185 (7.28)	221 (8.70)
AKD-x02407	24	48	16,000	200	23	306 (12.01)	105 (4.13)	228 (8.98)	264 (10.39)
AKD-x04807	48	96	35,000	—	—	385 (15.16)	185 (7.28)	225 (8.86)	260 (10.23)

Note 1: For complete AKD model nomenclature, refer to page 70.  
 Note 2: Additional AKD information can be found online.



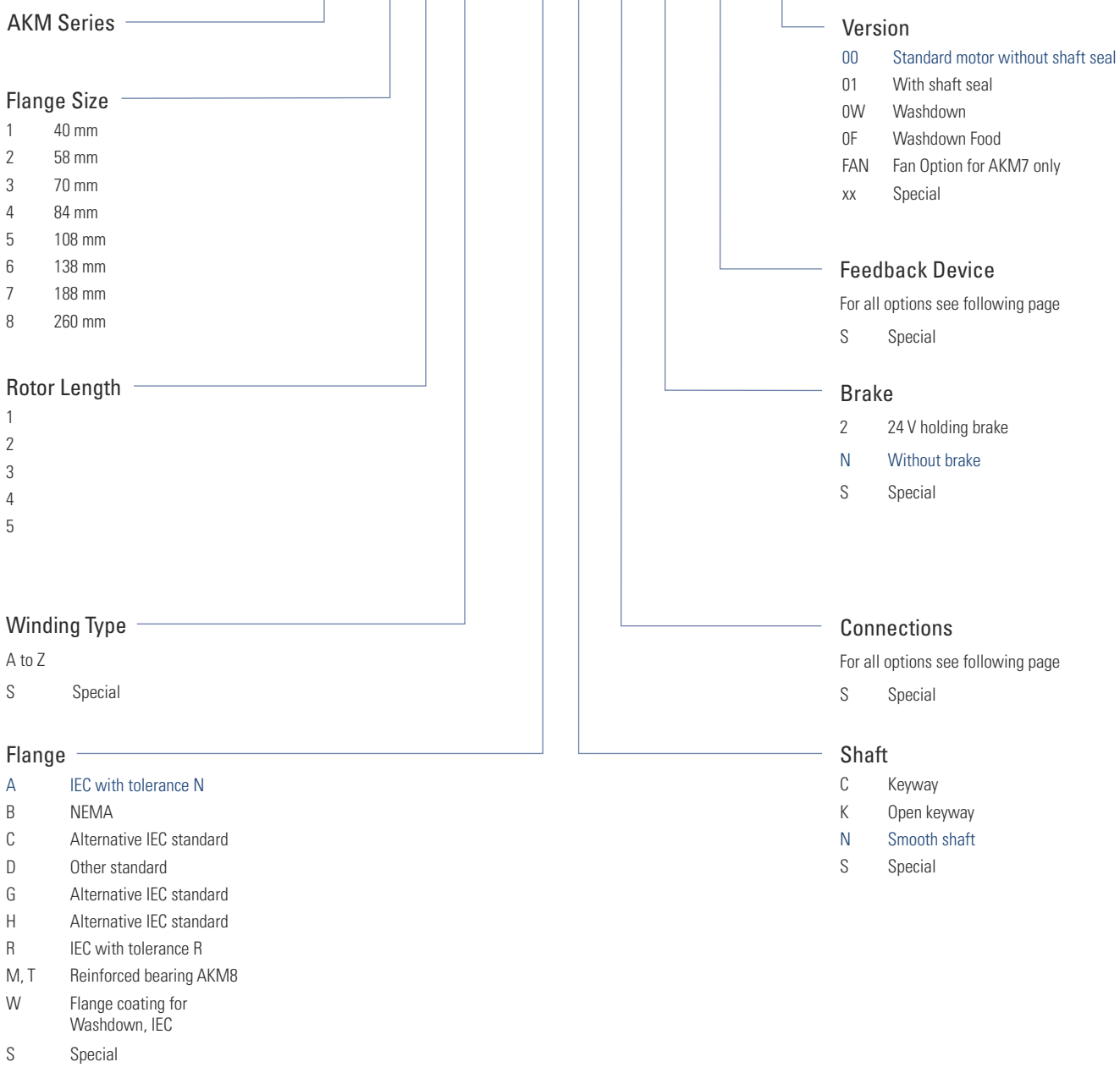


# Model Nomenclature

MODEL NOMENCLATURE

## AKM® Brushless Servo Motor

**AKM 6 2 P – A N C N DA 00**



## Feedback Unit Options

Code	Designation	Model	Can be used with	Connection Option	Comment
1-	Comcorder		AKM1 - AKM8	1, 2, 7, B, C, G, H, T	1024 incr./rev
2-	Comcorder		AKM1 - AKM8	1, 2, 7, B, C, G, H, T	2048 incr./rev
AA	BiSS B encoder	AD36	AKM2 - AKM4	1, 7, B, C, M	Single-turn, optical
AA	BiSS B encoder	AD58	AKM5 - AKM8	1, 2, C, G, H, M, T	Single-turn, optical
AB	BiSS B encoder	AD36	AKM2 - AKM4	1,7,B, C, M	Multi-turn, optical
AB	BiSS B encoder	AD58	AKM5 - AKM8	1, 2, C, G, H, M, T	Multi-turn, optical
C-	Smart Feedback Device SFD	Size 10	AKM1	1, D, Y, M, P	Single-turn 4-wire
C-	Smart Feedback Device SFD	Size 15	AKM2 - AKM4	1, D, Y, M, P	Single-turn 4-wire
C-	Smart Feedback Device SFD	Size 21	AKM5- AKM8	1, D, Y, M, P	Single-turn 4-wire
CA	Smart Feedback Device SFD3		AKM1 - AKM6	D	Single-turn 2-wire
DA	EnDAT 2.1 encoder	ECN 1113	AKM2 - AKM4	1, 7, B, C, M	Single-turn, optical
DA	EnDAT 2.1 encoder	ECN 1313	AKM5 - AKM8	1, 2, C, G, H, M, T	Single-turn, optical
DB	EnDAT 2.1 encoder	EQN 1125	AKM2 - AKM4	1, 7, B, C, M	Multi-turn, optical
DB	EnDAT 2.1 encoder	EQN 1325	AKM5 - AKM8	1, 2, C, G, H, M, T	Multi-turn, optical
LA	EnDAT 2.1 encoder	ECI 1118	AKM2 - AKM3	1, 7, B, C, M	Single-turn, inductive
LA	EnDAT 2.1 encoder	ECI 1319	AKM4 - AKM8	1, 2, C, G, H, M, T	Single-turn, inductive
LB	EnDAT 2.1 encoder	ECI 1130	AKM2 - AKM3	1,7, B, C, M	Multi-turn, inductive
LB	EnDAT 2.1 encoder	ECI 1331	AKM4 - AKM8	1, 2, C, G, H, M, T	Multi-turn, inductive
GJ	HIPERFACE encoder	SKS36	AKM2 - AKM8	1,2,7, B, C, G, H, M, T	Single-turn, optical
GK	HIPERFACE encoder	SKM36	AKM2 - AKM8	1,2,7, B, C, G, H, M, T	Multi-turn, optical
GP	HIPERFACE encoder	SEK34	AKM1	1, Y, M	Single-turn, capacitive
GR	HIPERFACE encoder	SEL34	AKM1	1, Y, M	Multi-turn, capacitive
GE	HIPERFACE DSL encoder	EKS36	AKM2 - AKM8	D	Single-turn, optical
GF	HIPERFACE DSL encoder	EKM36	AKM2 - AKM8	D	Multi-turn, optical
GM	Safety HIPERFACE	SKS36S	AKM2 - AKM8	1, 2, 7, B, C, G, H, M, T	Single-turn, optical
GN	Safety HIPERFACE	SKM36S	AKM2 - AKM8	1, 2, 7, B, C, G, H, M, T	Multi-turn, optical
MA	Drive Cliq	ECN1324S	AKM4 - AKM8		Single-turn, optical
MB	Drive Cliq	EQN1336S	AKM4 - AKM8	tba	Multi-turn, optical
R-	Resolvers	Size 10	AKM1	1,2,7, B, C, G, H, M, T, Y	2-pin, hollow shaft
R-	Resolvers	Size 15	AKM2 - AKM4	1,2,7, B, C, G, H, M, T, Y	2-pin, hollow shaft
R-	Resolvers	Size 21	AKM5 - AKM8	1,2,7, B, C, G, H, M, T, Y	2-pin, hollow shaft

\* not available for AKM2 with connection option C (cable with IP65 connector)

## Connector Options

Code		Can be used with	Protection class	Connection type	Description
With PTC	With KTY 84-130				
B	1	AKM2	IP65	2 threaded connectors, size 1.0	Angled, rotatable, mounted on motor
C	7	AKM1 - AKM2	IP65	2 threaded connectors, size 1.0	On 0.5 m cable
C	1	AKM3	IP65	2 threaded connectors, size 1.0	Angled, rotatable, mounted on motor
C	1	AKM4 - AKM7	IP65	2 Speed Tec Ready connectors, size 1.0	Angled, rotatable, mounted on motor
-	D	AKM1	IP65	1 hybrid i-tec connector	Mounted on motor
-	D	AKM2 - AKM6	IP65	1 hybrid threaded connector, size 1.0	Angled, rotatable, mounted on motor
G	-	AKM2 - AKM3	IP67	2 threaded connectors, size 1.0	Straight, mounted on motor
G	-	AKM4 - AKM6	IP67	2 Speed Tec Ready connectors, size 1.0	Straight, mounted on motor
H	1	AKM74Q and AKM82T	IP65	1 feedback threaded connector, size 1.0 1 power threaded connector, size 1.5	Angled, rotatable, mounted on motor
M	-	AKM1 - AKM4	IP20	2 Molex connectors, $I_0 < 6$ A	On 0.5 m cable
P	-	AKM1 - AKM4	IP20	1 Molex connector, $I_0 < 6$ A	On 0.5 m cable
R	-	AKM4 - AKM7	IP65	1 feedback threaded connector M12 1 power connector SpeedTec-Ready M23	Straight, mounted on motor Angled, mounted on motor
T	2	AKM8	IP65	1 terminal box IP65 for power 1 Feedback threaded connector, size 1.0	Mounted on motor
Y	1	AKM1	IP65	1 y-tec® connector	Mounted on motor

# Model Nomenclature

## AKD® Servo Drive

**AKD – B 003 06 – NB AN – 0000**

AKD Series

Version

B = Base drive

C = Central power supply for AKD-N (Requires CB Extension)

N = Decentralized drive (Requires DB, DF, or DS Extension)

P = Position indexer (motion tasking)

T = AKD BASIC Language Programmable drive (Requires IC or NB Extension)

M = Multi-axis Master Drive (Requires MC Extension option, and EC Connectivity option)

Current Rating

003 = 3 Amp

006 = 6 Amp

010 = 10kW (for AKD-C, this field refers to power.)

012 = 12 Amp

024 = 24 Amp

048 = 48 Amp

Voltage

06 = 120/240 Vac 1Ø/3Ø (24 Amp Drive: 240 Vac 3Ø only)

07 = 240/480 Vac 3Ø (Version C: 07 = 400/480 Vac 3Ø | Version N: 07 = 560/680 Vdc)

Variants

0000 = Standard

Connectivity\*

AN = Analog command

CN = CANopen®

EC = EtherCAT®

EI = EtherNet/IP™

PN - PROFINET®

SQ = SynqNet®

Drive Version Availability

B, P, T

P

C, M, N, P

P

P

B

\*Motion Tasking is included as a free upgrade with CN, EC, EI and PN

Extension

CB = without extension (AKD-C version only)

DB = hybrid motor cable (AKD-N version only)

DF = additional EtherCAT® port + feedback connector (AKD-N version only)

DS = local STO + feedback connector (AKD-N version only)

IC = Expanded I/O version and SD card slot (AKD-T version only)

NB = Without extensions

Note: Options shown in blue text are considered standard.

## S700 Servo Drive

**S7 48 0 2 – NA – NA – NA**

**S700 Series**

**Current Rating**

- 01 = 1.5 Arms
- 03 = 3 Arms
- 06 = 6 Arms
- 12 = 12 Arms
- 24 = 24 Arms
- 48 = 48 Arms
- 72 = 72 Arms

**Voltage Rating**

- 0 = 208...480 Vac**
- 6 = 110...230 Vac (with 1.5 to 24 Arms only)

**Electrical Options**

- 2 = Standard**

**Expansion Card Slot 3**

**NA = No Expansion card in Slot 3  
EtherCAT and CANopen on board**

- F2 = Fan controller
- PM = Post/O
- PA = Post/O-Monitor
- S1 = Safety card SIL 3
- S2 = Safety card SIL 2

**Expansion Card Slot 2**

**NA = No Expansion card in Slot 2  
EtherCAT and CANopen on board**

- F2 = Fan controller
- PM = Post/O
- PA = Post/O-Monitor

Expansion card F2 in Slot 2 can be used with a card in Slot 1.

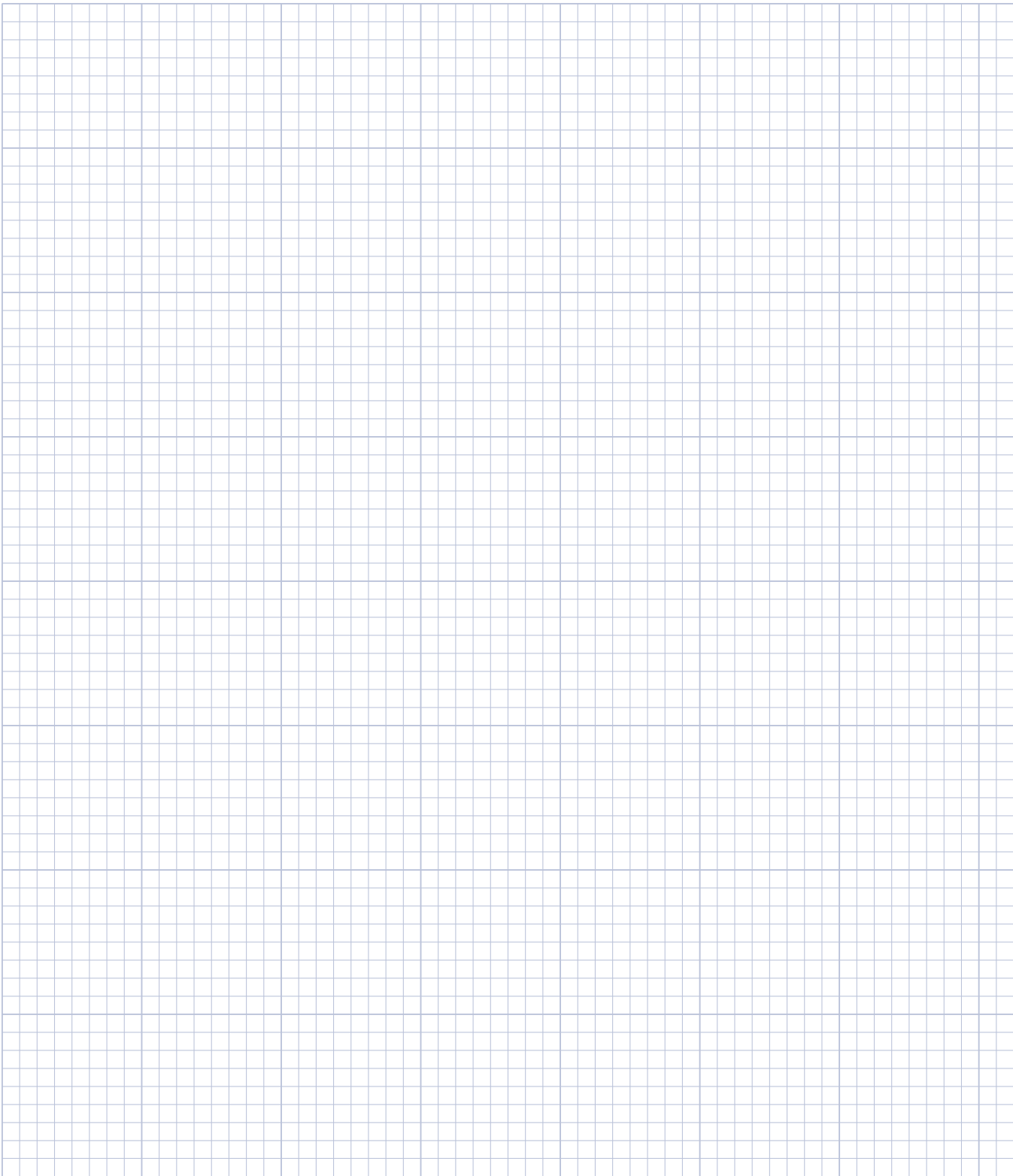
**Expansion Card Slot 1**

**NA = No expansion card in Slot 1,  
EtherCAT and CANopen on board**

- DN = DEVICENET
- PB = PROFIBUS
- SE = SERCOS
- SN = SYNQNET
- EI = I/O extension

Expansion card F2 in Slot 2 can be used with a card in Slot 1.

# Notes



# MOTIONEERING® Online

MOTIONEERING® Online – Kollmorgen has revamped, modernized and put online one of the most respected applications sizing programs of the last 20 years. You now can access this application sizing and selection tool wherever you have access to the internet. MOTIONEERING Online is just a start of a series of releases that will empower you to optimize solutions for your toughest applications. Sizing frameless motors and drive systems has never been easier. Using a mechanism project concept for collecting and saving multiple axes of load information, MOTIONEERING® Online can automatically calculate application results and compare against a catalog of systems - recommending the most optimized set of Kollmorgen system solutions available.

Versatile units-of-measure selection options for mechanism and motion profile data-entry, with the ability to convert data into other available units, makes this a convenient international tool. A user-friendly Help file teaches program functions and algorithms used to provide results.

## Mechanism Projects

- Direct drive entry, lead screw, conveyor
- Rack and pinion, nip rolls
- Direct Drive Rotary
- Electric Cylinder
- Direct data entry

**Desired Safety Margins**

Continuous Torque Margin: 10%  
Peak Torque Margin: 10%  
Maximum Speed Margin: 10%

**Result Legend**

- Meets or exceeds all criteria
- Meets physical requirements but fails to meet one or more safety margins
- Meets performance requirements except for inertia ratio
- Meets requirements except amplifier time constant
- Fails to meet one or more performance requirements

System-Motor/Amplifier	Continuous Torque Margin (%)	Peak Torque Margin (%)	Maximum Speed Margin (%)	Power Margin (%)	Inertia Ratio	
AKM425F-AND-00006 (240 V)	37	105	11	104	31.737	Select
AKM425F-AND-00007 (480 V)	35	10	11	101	31.737	Select
BH-124-B-570302 (480 V)	49	173	4	176	14.870	Select
AKM425F-AND-00006 (240 V)	1	34	11	97	42.578	Select
MH-227-B-570302 (480 V)	84	119	4	245	2.885	Select
MH-125-B-570302 (480 V)	37	143	4	154	2.028	Select
BH-125-B-570302 (480 V)	111	180	4	283	8.961	Select
AKM425F-AND-00006 (120 V)	2	1	11	81	42.578	Select
AKM425F-AND-00009 (120 V)	37	100	13	89	31.737	Select
AKM425F-AND-00008 (120 V)	65	100	134	40	26.891	Select
AKM425F-AND-00004 (120 V)	42	100	41	2	20.773	Select

## Solution Set Search Screen

- Color-coded indication of system's ability to meet application requirements
- Review system components specifications
- Save, print, or create a pdf application report
- Evaluate system performance curve with application points

## MOTIONEERING® Online Features:

- Inertia Calculator - lets you build up inertia based on odd shapes by additive or subtractive methods
- Custom Motion Profile - easy to add entire segments or copy segments to repeat
- Environmental Factor - takes into account your ambient temperature
- Project by Project Units - You can tailor your units on a project by project basis, or use the global units settings

## MOTIONEERING Online Supported Browsers

- IE, Chrome, Firefox, Safari



www.kollmorgen.com/motioneering

## About Kollmorgen

Since its founding in 1916, Kollmorgen's innovative solutions have brought big ideas to life, kept the world safer, and improved peoples' lives. Today, its world-class knowledge of motion systems and components, industry-leading quality, and deep expertise in linking and integrating standard and custom products continually delivers breakthrough motion solutions that are unmatched in performance, reliability, and ease-of-use. This gives machine builders around the world an irrefutable marketplace advantage and provides their customers with ultimate peace-of-mind.

For assistance with your application needs  
in North America, contact us at: **540-633-3545**,  
[support@kollmorgen.com](mailto:support@kollmorgen.com) or visit  
[www.kollmorgen.com](http://www.kollmorgen.com) for a global contact list.



**KOLLMORGEN**®

*Because Motion Matters™*

Kollmorgen  
203A West Rock Road  
Radford, VA 24141 USA  
Phone: 1-540-633-3545  
Fax: 1-540-639-4162

Kollmorgen Europe GmbH  
Pempelfurtstraße 1  
40880 Ratingen  
Germany  
Phone: +49 (0) 2102 9394 0  
Fax: +49 (0) 2102 9394 3155

Kollmorgen Asia  
Floor 4, Building 9, No. 518,  
North Fuquan Road, Changning District,  
Shanghai 200335, China  
Phone: + 86 400 661 2802

Kollmorgen Aerospace and Defense  
501 West Main Street  
Radford, VA 24141 USA  
Phone: 1-540-731-5668  
Fax: 1-540-731-5679