

AKD[®] 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 up-time. With Kollmorgen servo components, we can help you increase your machine's OEE by 50%.

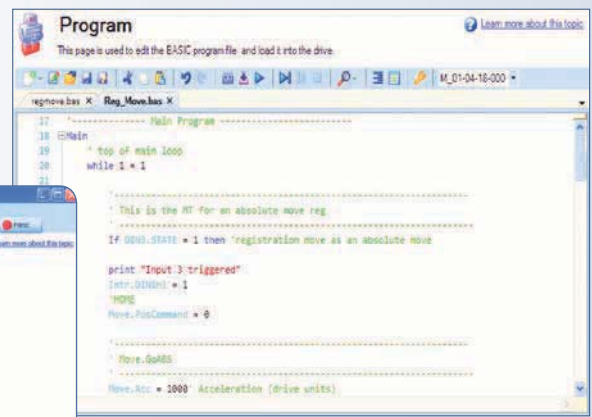
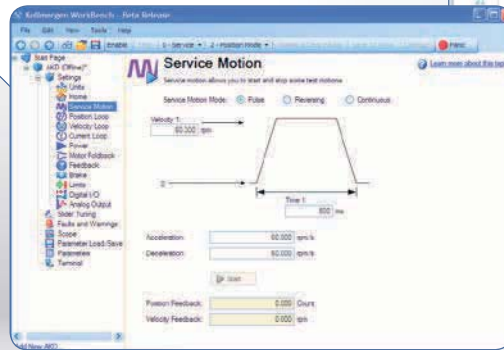
The Benefits of AKD Servo Drive

- 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 A_{rms} to 48 A_{rms} continuous current; 9 A_{rms} to 96 A_{rms} 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, EnDat 2.1, BiSS, analog Sine/Cos encoder, incremental encoder, HIPERFACE®, and resolver
 - Single cable feedback with digital resolvers (SFD3) and HIPERFACE® DSL
 - Tightly integrated Ethernet motion buses without the need to add large hardware: EtherCAT®, SynqNet®, Modbus® TCP, EtherNet/IP™, PROFINET®, SERCOS® III, and CANopen®
 - Scalable programmability from base torque-and-velocity through multi-axis master

Scalable Programmability

Kollmorgen delivers cutting-edge technology and performance with the AKD® servo drive and KAS controls platform. Whether your application requires a single axis or over 100 fully synchronized axes, Kollmorgen’s intuitive software and tools scale to meet your needs. From simple analog torque control to the latest high-performance automation network, the AKD servo drive packs power and flexibility for virtually any application into one of the most compact footprints of any digital servo drive in the industry.

- Patented auto-tuning delivers optimized performance in seconds.
- 1.5 MHz current loop and 16 kHz velocity loops offers greater bandwidth and performance
Optimized performance in seconds
- Greater throughput and accuracy
- Easy-to-use Graphical User Interface (GUI) for faster commissioning and troubleshooting
- Flexible and scalable to meet any application



Motion Tasking ("P" Option)

- Adds simple point-and-click indexing to base drive
- Provides user with pre-programmed options
- Guides novice user through simplified steps to create indexing moves
- Network connectivity to EtherCAT®, CANopen®, Profinet®, Ethernet/IP™, TCP/IP, SynqNet and others
- MODBUS port for communication with HMI
- Controlled by analog torque-and-velocity commands
- Includes electronic gearing via X9 connector
- Includes access to 11 digital I/O and 2 analog I/O on base drive
- Includes 2 high-speed digital inputs
- Expandable to 31 digital I/O and 4 analog I/O

BASIC Programmable 1.5 Axis Drive ("T" Option)

- Adds BASIC programmability to base AKD
- 4 kHz programmable interrupt service routines
- Conditional statements, built-in math functions, user functions and subroutines
- Includes 2 high-speed digital inputs
- Same package size as base drive
- Expandable to 31 digital I/O and 4 analog I/O
- Optional integrated SD card for easy backup and drive cloning
- Includes electronic camming functionality

Basic Operation

Single-Axis

RANGE OF KOLLMORGEN AUTOMATION SUITE CAPABILITIES



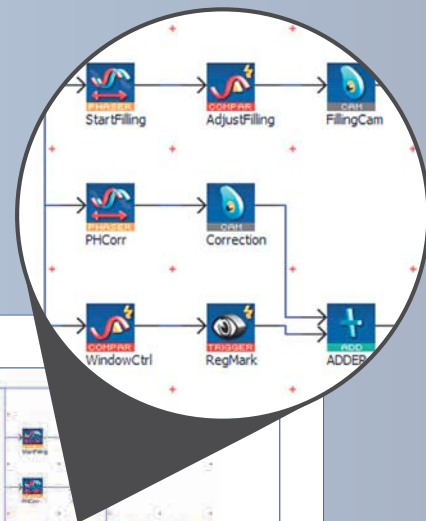
Programmable Drive Multi-Axis Master PDMM ("M" Option)

- Scalable solution for use as a single-axis drive with integrated programmable automation controller
- Choose from all five IEC 61131-3 languages for soft PLC process programming
- Program motion using your choice of PLCopen for motion or our innovative Pipe Network™
- 4 kHz PLC scan rate and EtherCAT® updates
- Complete line of HMI panels with integrated software to simplify GUI development
- Exclusive function blocks, such as "wait," enable your program to act as a scanning or sequential language
- On-board I/O includes 17 digital (with 2 high speed inputs) and 2 analog
- Connects to AKT™ network I/O for nearly unlimited expandability

Seamlessly add additional axes and AKD PDMM serves as a high-performance multi-axis machine controller

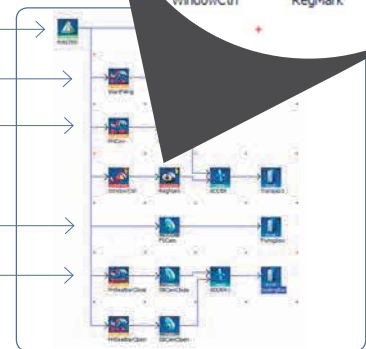
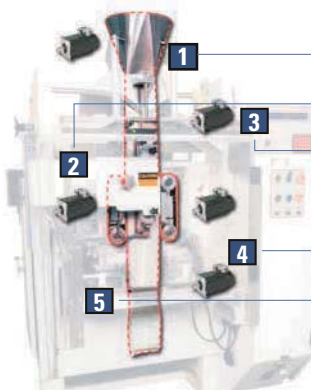
- SD card for easy backup and system updates
- Integrated webserver for diagnostics and troubleshooting from any computer or mobile device
- Provide true synchronized-path control of up to 32 axes*
- Reduce cabinet size and wiring requirements with a single, compact package
- Easily manage remote I/O and the I/O of all attached drives via EtherCAT®
- Use industry standard PLCopen for motion, or step up to Kollmorgen's Pipe Network™ to program sophisticated camming and gearing applications in a matter of minutes

*Maximum axis count depends on motion/automation complexity and performance (8 axes nominal based on medium complexity at 4 kHz network update rate)



Pipe Network™ Kollmorgen Visual Motion Programming

- Accelerate development by programming tasks in hours that would otherwise take weeks
- Improved coding quality through visual programming and by using pre-built modules that have been thoroughly tested and optimized
- Easy knowledge transfer, replacing pages of complex code with easily understood graphical representations
- Available on PDMM and PCMM controllers



Pipe Network provides a one-to-one translation of a mechanical system into a logical world as shown in the Vertical Form Fill and Seal machine above. Click and build your motion program in minutes, or contact Kollmorgen for examples of common machine architectures to further accelerate your development.

Programming

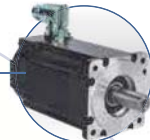
Multi-Axis Programming

AKD[®] 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.



AKMH[™] Hygienic Stainless Steel Motors



AKM[®] 2G Servo Motors



Frameless Brushless Direct Drive Motors



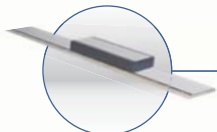
AKD[®]-N Decentralized Servo Drive



Cartridge DDR[™] Motors



Housed DDR[™] Motors



ICH Direct Drive Linear Motors



ERD Hygienic Stainless Steel Linear Actuators



AKD[®] Servo Drive



Control of motors with AKD[®] PDMM programmable multi-axis master

Best-in-Class Components

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



Industry-leading power density



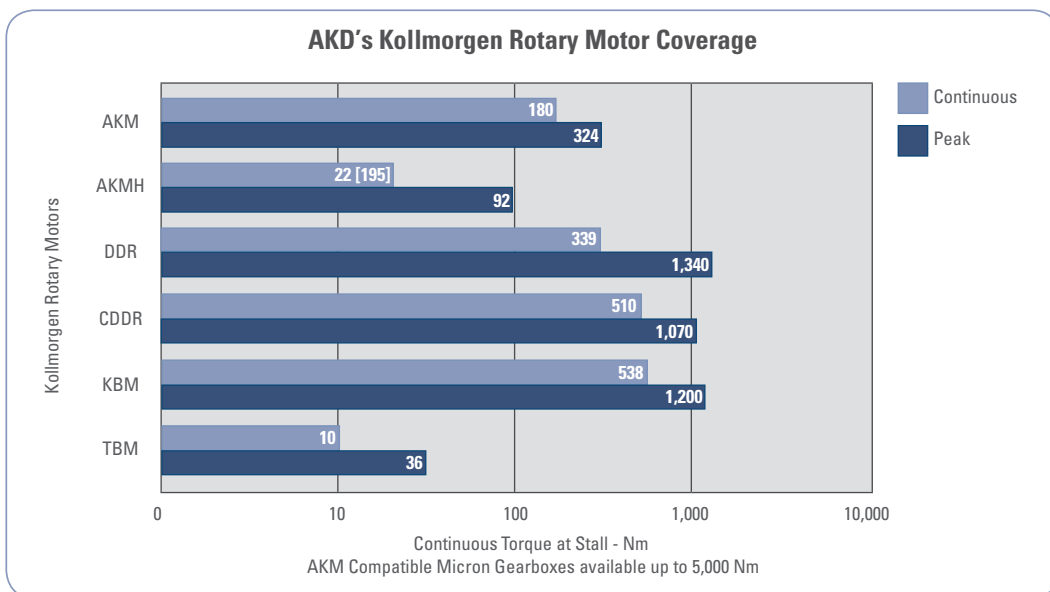
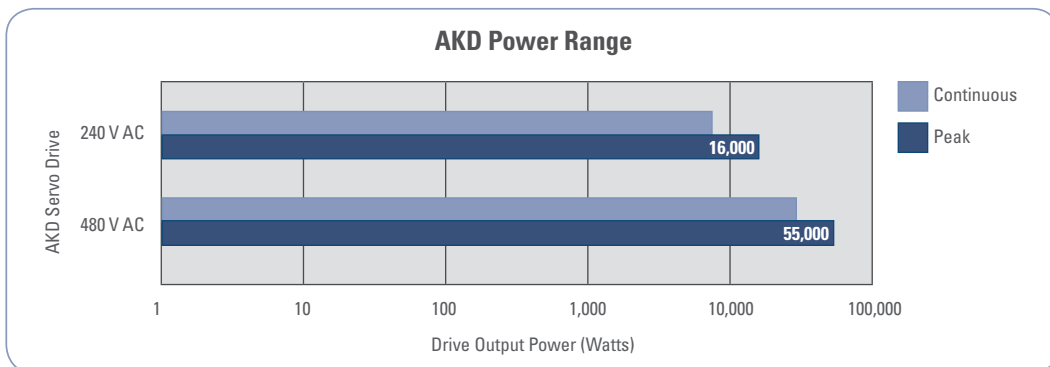
General Specifications

120 / 240 V AC 1 & 3 Phase (85 - 265 V)	Continuous Current (A _{rms})	Peak Current (A _{rms})	Drive Continuous Output Power Capacity (Watts)	Internal Regen		Height mm	Width mm	Depth mm	Depth with Cable Bend Radius mm
				(Watts)	(Ohms)				
AKD-■00306	3	9	1100	0	0	168	59	156	184
AKD-■00606	6	18	2000	0	0	168	59	156	184
AKD-■01206	12	30	4000	100	15	196	78	187	215
AKD-■02406	24	48	8000	200	8	248	100	228	265
240/480 V AC 3 Phase (187-528 V)	Continuous Current (A _{rms})	Peak Current (A _{rms})	Drive Continuous Output Power Capacity (Watts)	Internal Regen		Height mm	Width mm	Depth mm	Depth with Cable Bend Radius mm
(Watts)				(Ohms)					
AKD-■00307	3	9	2000	100	33	256	70	185	221
AKD-■00607	6	18	4000	100	33	256	70	185	221
AKD-■01207	12	30	8000	100	33	256	70	185	221
AKD-■02407	24	48	16,000	200	23	306	105	228	264
AKD-■04807	48	96	35,000	–	–	385	185	225	260

AKD[®] Servo Drive

Range of Coverage

When you pair the AKD servo drive with any of our Kollmorgen motors or linear actuators, you'll achieve optimized performance. From 3 A_{rms} to 48 A_{rms} continuous current and 9 A_{rms} to 96 A_{rms} peak current, the feature-rich AKD provides a solution for nearly any application.



Feedback & I/O

AKD® servo drive is specifically designed with the versatility, communications, and power you need to expand machine performance and increase integration speeds. Motor set-up is plug-and-play and multiple Ethernet connectivity options provide both open and closed protocols. Online troubleshooting and data verification enable faster, bug-proof programming. And a broad power range in a smaller, compact design allows you to use these robust drives with a single interface while experiencing industry-leading, high-performance servo loops.

AKD Specifications

	Standard Drive	With I/O expansion *
Encoder Output or AUX Encoder Input	2.5 MHz Maximum line frequency	
Feedback	Smart Feedback Device (SFD), EnDat 2.2, EnDat 2.1, BiSS, analog Sine/Cos encoder, incremental encoder, HIPERFACE®, and resolver	
Logic supply	24 V DC	
Digital input (24 Vdc)	8 (1 dedicated to enable)	20 (1 dedicated to enable)
Digital output (24 Vdc)	3 (1 dedicated to fault relay)	13 (1 dedicated to fault relay)
Analog input (+/- 10 Vdc, 16-bit)	1	2
Analog output (+/- 10 Vdc, 16-bit)	1	2
Programmable inputs	7	19
Programmable outputs	2	12
Sink/Source inputs/outputs	Yes	Yes

Note: Only with AKD-T

AKD[®] Servo Drive

Ethernet Connectivity

- Ethernet-based AKD servo drive provides the user with multiple bus choices
- EtherCAT[®] (DSP402 protocol), Modbus[®] TCP, SynqNet[®], EtherNet/IP[™], PROFINET[®], SERCOS III, and CANopen[®]
- No option cards are required

Industrial Design

- Rugged circuit design and compact enclosure for space-saving, modern appearance – minimizes electrical noise emission and susceptibility
- Full fault protection
- UL, cUL listed, and CE
- No external line filters needed (480 V AC units) for CE & UL compliance
- Removable screw terminal connectors for easy connections
- DC Bus sharing

Safe-Torque-Off (STO)

(IEC 61800 SIL2)

- Switches off the power stage to ensure personnel safety and prevents an unintended restart of the drive, even in fault condition
- Allows logic and communication to remain on during power stage shut down

Internal Regenerative Braking Resistor

(All powers except 120/240 V AC 3 A_{rms} and 6 A_{rms})

- Simplifies system components
- Saves overhead of managing external regeneration when internal regeneration is sufficient

Performance Servo Tuner (PST)

- Exclusive patent pending auto-tuner reaches optimized set-up in seconds
- Handles inertia mismatches up to 1000:1
- Industry leading bandwidth under compliant and stiff load conditions, no matter the mechanical bandwidth of the machine



Plug-and-Play with Kollmorgen Motors and Actuators

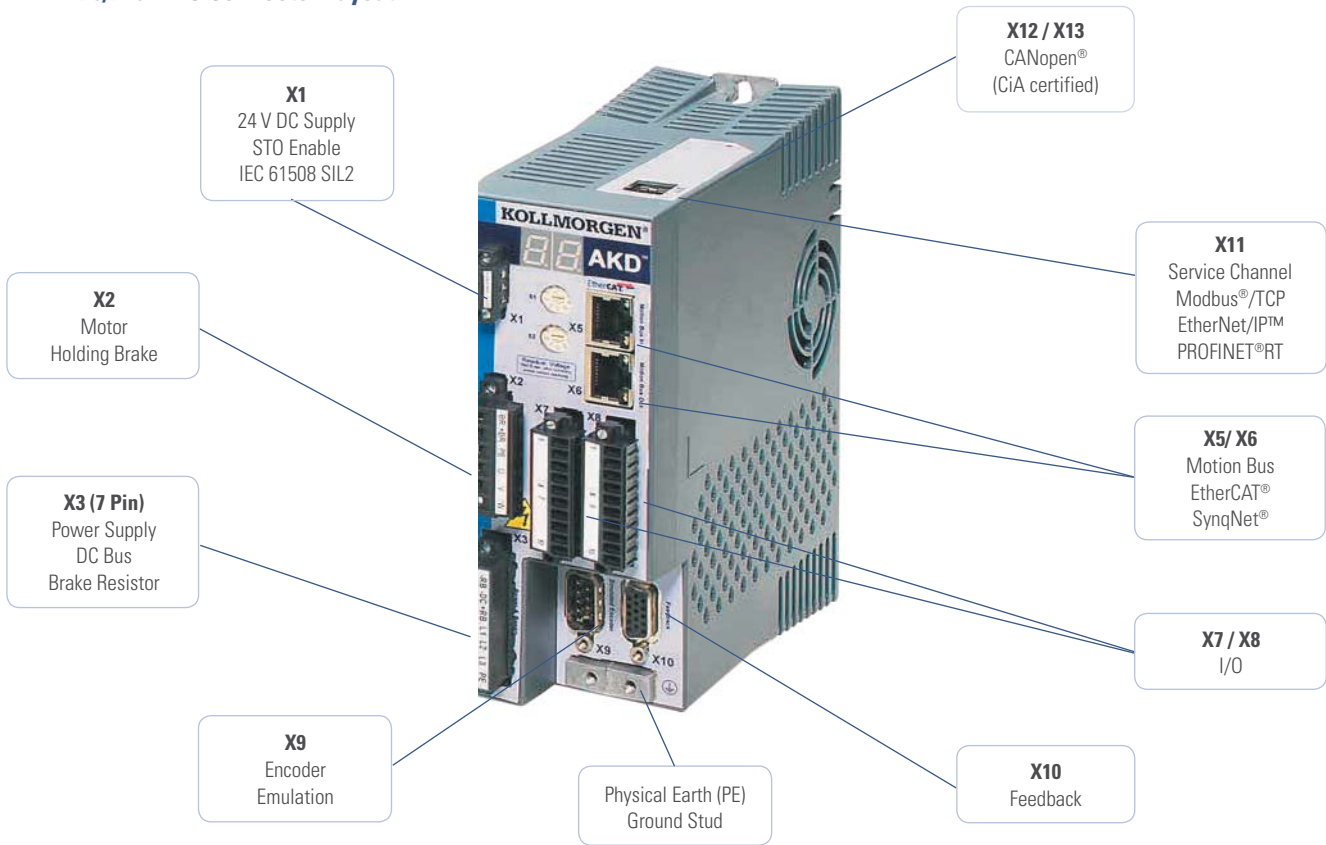
- Electronic motor nameplates allow parameters to automatically load for fast commissioning
- Motion in seconds
- Custom motor parameters easily entered

I/O (Base Drive)

- 8 digital inputs (1 dedicated to enable)
- 2 high-speed digital inputs (maximum time delay of 1.0 μs)
- 3 digital outputs (1 dedicated to fault relay)
- 1 analog input - 16 bit
- 1 analog output - 16 bit



AKD 120/240 V AC Connector Layout



AKD 240/480 V AC Connector Layout

