Kollmorgen Cartridge Direct Drive Rotary® Motors Catalog

with AKD™ Servo Drive Systems

Cartridge Direct Drive Rotary® Motor Series

KOLLMORGEN®

Because Motion Matters™

Kollmorgen.
Every solution comes from a real understanding of OEM challenges.

The ever-escalating demands of the marketplace mean increased pressure on OEMs at every turn. Time constraints. Demands for better performance. Having to think about the next-generation machine even before the current one is built. While expectations are enormous, budgets are not. Kollmorgen's innovative motion solutions and broad range of quality products help engineers not only overcome these challenges but also build truly differentiated machines.

Because motion matters, it's our focus. Motion can distinctly differentiate a machine and deliver a marketplace advantage by improving its performance. This translates to overall increased efficiency on the factory floor. Perfectly deployed machine motion can make your customer's machine more reliable and 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, relentlessly developing products that offer precision control of speed, accuracy and position in machines that rely on complex motion.

KOLLMORGEN®

Because Motion Matters™

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 knock them down 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 is in full response mode with complete solutions that combine programming software, engineering services and best-in-class motion components.

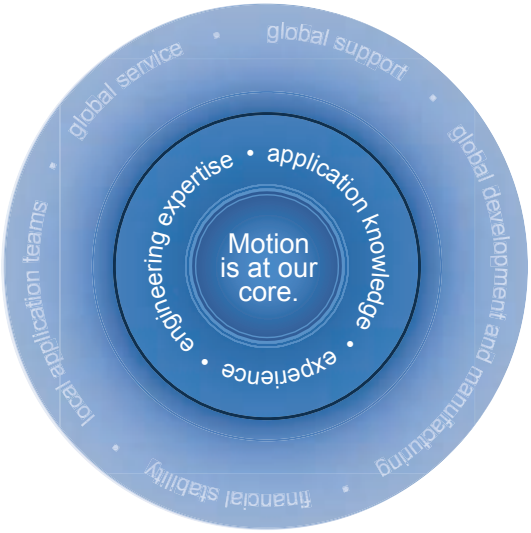
Global Footprint

With direct sales, engineering support, manufacturing facilities, and distributors across North America, 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 Danaher Corporation, our $13B parent company. A key driver in the growth of all Danaher divisions is the Danaher 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.

Table of Contents



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 the wide selection of products that Kollmorgen offers. 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 effectiveness by 50%.

* Patents pending.

Features	Benefits
• Highest resolution feedback (up to 27-bit)	• Higher machine speed/throughput, excellent repeatability
• High bandwidth torque-and-velocity loops –fastest digital torque loop in the market: 0.67 µs	• Immediately accommodate changing load conditions
• Multi-function Bode Plot	• Easily evaluate and optimize motion and machine performance
• Industry-leading and patent pending auto-tuning algorithms	• Optimize efficiency with the click of button with auto-tuning
• Advanced servo techniques such as high-order observer and bi-quad filters	• Industry-leading machine performance
• Powerful dual processor enables fast settling times	• Reduce scrap, better quality
• Powerful dual processor to hold programs/recipes	• Quicker changeover, greater uptime
• Six-channel "real-time" software oscilloscope	• Fast commissioning and diagnostics
• Auto-complete of programmable commands	• Save time looking up parameter names
• One-click capture and sharing of program plots and parameter settings	• Instantly send machine performance data
• Best Graphical User Interface (GUI) in the market – intuitive icons and screen flow	• Quick and easy programming
• Industry-leading power density	• More power, cooler running, smaller space
• 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	• Quicker time to market, more choices
• Tightly integrated Ethernet motion buses on board base drive - EtherCAT®, Modbus/TCP, and CANopen®	• Reduce cable costs, industry standards, readily available.
• Runs rotary and linear motors	• Diverse and flexible
• Widest range of programming options in the industry	• Seamlessly compatible with a range of front-end controls

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.

Micron™ Gearheads

AKM™ Servomotors

Cartridge Direct Drive Rotary® Motors

Housed Direct Drive Rotary Motors

Direct Drive Linear Motors

Linear Positioners

Multi-Axis Precision Tables

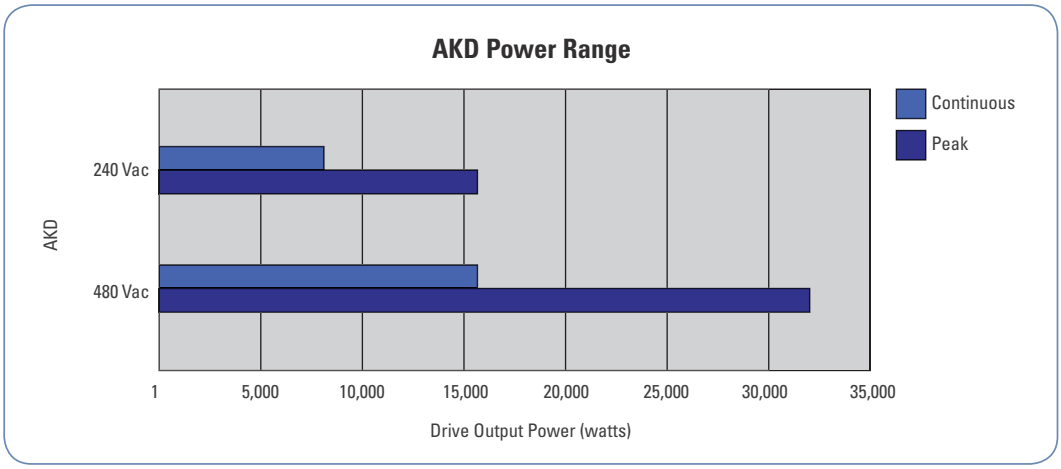
Best-in-Class Components

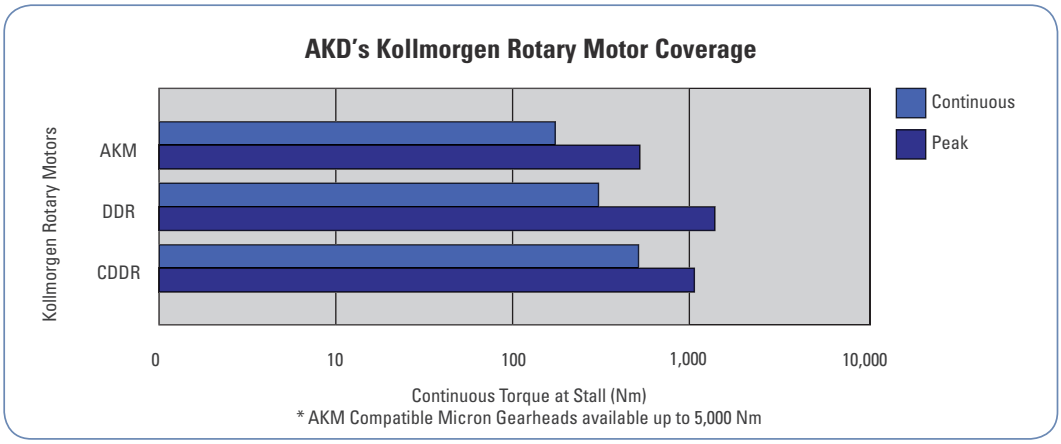
AKD works seamlessly with Kollmorgen motors and positioners–well-known for quality, reliability, and performance.

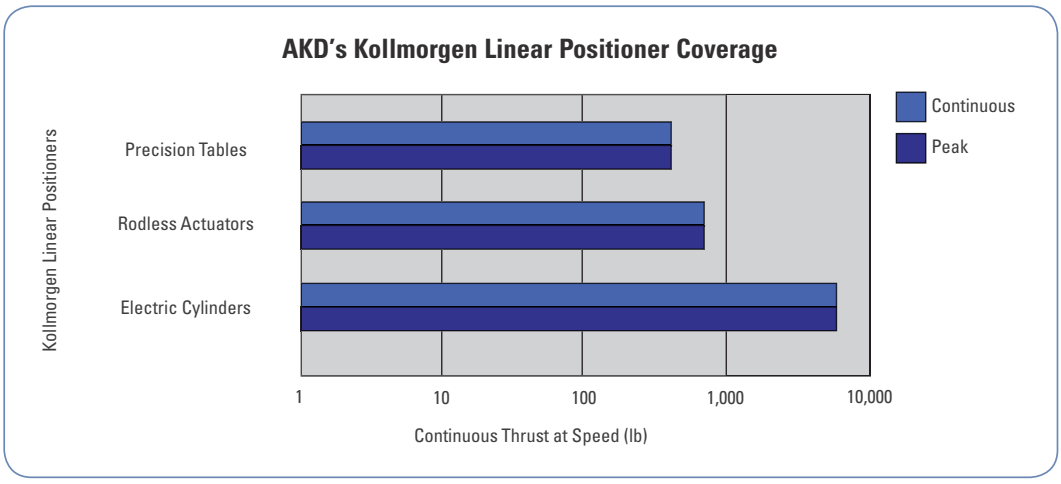
AKD™ Servo Drive

AKD Range of Coverage

When you pair the AKD Servo Drive with any of our Kollmorgen rotary motors or linear positioners, you'll achieve optimized performance. From 3 to 24 Arms continuous current and 9 to 48 Arms peak current, the feature-rich AKD provides a solution for nearly any application.







AKD Servo Drive

AKD 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 trouble-shooting 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.

Industry-leading high performance servo loops

Performance Specifications

Servo Loop	Update Rate	Bandwidth (Max)
Current Loop	1.5 MHz, (0.67 µs)	5.0 kHz
Velocity Loop	16 kHz, (62.5 µs)	1.6 kHz
Position Loop	8 kHz, (125 µs)	0.8 kHz

Inputs/Outputs		
Digital Input Events	16 kHz, (62.5 µs) Update Rate	
Encoder Output or AUX Encoder Input	2.5 MHz Maximum Line Frequency	
Feedback	Smart Feedback Device (SFD), EnDat2.2, 01, BiSS, Analog Sine/Cos encoder, incremental encoder, HIPERFACE®, and resolver	
Logic Supply	24 Vdc	
	Base Drive	With I/O Expansion
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

Modbus/TCP

Industry-leading power density

General Specifications

120 / 240 Vac 1& 3Ø (85 -265 V)	Continuous Current (Arms)	Peak Current (Arms)	Drive Continuous Output Power (watts)	Internal Regen (watts)	(ohms)	Height mm (inches)	Width mm (inches)	Depth mm (inches)	Depth with Cable Bend Radius mm (inches)
AKD-■00306	3	9	1100	0	0	168 (6.61)	57 (2.24)	153 (6.02)	184 (7.24)
AKD-■00606	6	18	2000	0	0	168 (6.61)	57 (2.24)	153 (6.02)	184 (7.24)
AKD-■01206	12	30	4000	100	15	195 (7.68)	76 (2.99)	186 (7.32)	215 (8.46)
AKD-■02406	24	48	8000	200	8	250 (9.84)	100 (3.94)	230 (9.06)	265 (10.43)

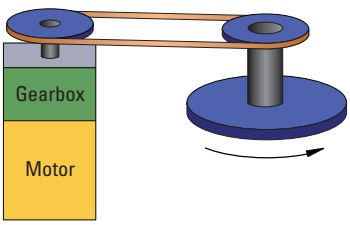
480 Vac 3Ø (187 -528 V)	Continuous Current (Arms)	Peak Current (Arms)	Drive Continuous Output Power (watts)	Internal Regen (watts)	(ohms)	Height mm (inches)	Width mm (inches)	Depth mm (inches)	Depth with Cable Bend Radius mm (inches)
AKD-■00307	3	9	2000	100	33	256 (10.08)	70 (2.76)	186 (7.32)	221 (8.70)
AKD-■00607	6	18	4000	100	33	256 (10.08)	70 (2.76)	186 (7.32)	221 (8.70)
AKD-■01207	12	30	8000	100	33	256 (10.08)	70 (2.76)	186 (7.32)	221 (8.70)
AKD-■02407	24	48	16,000	200	23	310 (12.20)	105 (4.13)	229 (9.02)	264 (10.39)
AKD-■04807	48	96	32,000	400	Available Q4, 2010				
AKD-■09607	96	192	64,000	800	Available Q4, 2010				

Note: For complete AKD model nomenclature, refer to page 40.

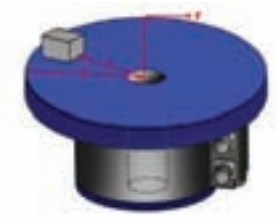
Direct Drive Technology (DDT)

Conventional servo systems commonly have a mechanical transmission which can consist of gears, gearheads, belts/pulleys or cams connected between the motor and the load.

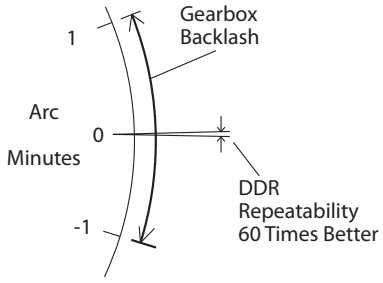
With Direct Drive Technology, the mechanical transmission is eliminated and the motor is coupled directly to the load.



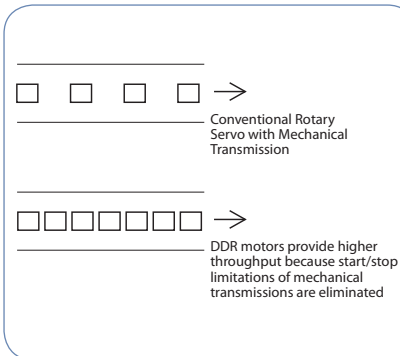
Servomotor and Gearhead



Direct Drive Motor



Improved Repeatability



Increased Throughput

Why Use Direct Drive Technology?

Increased Accuracy and Repeatability

A "precision" planetary gearhead could have a backlash of 1 arc-minute. This can result in the load moving by 1 arc-minute with an absolutely stationary drive motor. Kollmorgen's standard direct drive rotary (DDR) servomotors have repeatability better than 1 arc-second. Therefore, a direct drive motor can hold a position 60 times better than a conventional motor/gearhead.

The increased accuracy of direct drive technology results in a higher quality product out of the machine:

- Print registration is more accurate
- Cut or feed lengths can be held more precisely
- Coordination with other machine axes is more accurate
- Indexing location is more exact
- Tuning issues due to backlash are eliminated

Higher Bandwidth

Mechanical transmission components impose a limit on how fast a machine can start and stop and also extend the required settling time. These factors limit the possible throughput of a machine.

Direct drive technology removes these limitations and allows for much faster start/stop cycles and also provides greatly reduced settling time. This will allow a greater throughput from the machine. Users of direct drive systems have reported up to a 2X increase in throughput.

Improved Reliability and Zero Maintenance

Gears, belts, and other mechanical transmission parts break. By eliminating these parts and using DDR motors, the reliability of the machine is improved. Gearheads require periodic lubrication and/or replacement in aggressive start/stop applications. Belts require periodic tightening. There are no time-wear components in a direct drive motor and consequently they require zero maintenance.

Fewer Parts

With direct drive motors, all you need is the motor and the mounting bolts. This often replaces many parts including brackets, guards, belts, pulleys, tensioners, couplings, and bolts, resulting in:

- Fewer parts on the BOM. Less parts to purchase, schedule, inventory and control, and less parts to assemble.
- Assembly time of the servo drops from several hours with the mechanical transmission to several minutes with the DDR.
- Reduced cost. Although a direct drive motor may carry a small price-premium compared to a motor/gearhead with the same torque, consider that there is an overall cost reduction when eliminating the parts and labor of all the extra components required in a servo system with mechanical transmission.

No Inertia Matching

Servo systems with mechanical transmissions require inertia matching that limits the reflected load inertia at 5 to 10 times the motor inertia. If this limitation is not met, the system becomes difficult to control due to instability issues. Inertia matching limitations of mechanical transmission systems often force machine designers to use a larger motor than would otherwise be required just to satisfy the inertia matching requirement.

Such sizing conventions are not required with direct drive technology. Since the motor is directly connected to the load, the inertia of the motor and the load become a common inertia. Therefore, no inertia matching is required when using DDR. DDR applications have run with inertia ratios greater than 11,000:1.

Reduced Audible Noise

Machines with DDR motors have audible noise levels as low as 20 dB less than the same machine with a mechanical transmission.

Three DDR Product Categories to Choose From

Kollmorgen's 50 years of electromagnetic and electromechanical design experience combined with our quality and service, allowed us to refine and expand DDR technology into three product categories for easy installation, use, and short lead times: Frameless DDR, Housed DDR, and the Cartridge DDR. This allows you to select the right DDR solution for your application.

F Series Frameless DDR

Frameless motors include a rotor and stator as separate components which are integrated into, ride on the bearings of, and become a part of the driven load. Frameless motors offer the most compact and lightweight DDR solution available. The "F" series is Kollmorgen's latest Frameless DDR product. It provides excellent torque/volume with the use of a proprietary neodymium-iron magnet rotor structure and skewed armature assembly. The F series is the first UL recognized parts set available on the market. This provides OEMs with the benefits of UL component ratings for easier agency approval on their machines.

Housed DDR

The Housed DDR is a housed motor assembly featuring a factory aligned high-resolution feedback device and precision bearings, allowing it to function as the core of rotary indexing and rate table applications. The system can also be used as a flexible indexer, providing programmable, rapid indexing far exceeding the throughput and accuracy of conventional mechanical or variable reluctance technology indexers.

Cartridge DDR

This motor is the first in the industry to combine the space-saving and performance advantages of Frameless DDR technology with the ease of installation of a full-frame motor. Consisting of a rotor, stator, and factory-aligned high-resolution feedback device, the motor uses the machine's bearings to support the rotor. An innovative compression coupling engages the rotor to the load and the frame of the motor mounts to the machine with a bolt circle and pilot diameter just like a conventional servomotor, saving space and design time and simplifying the overall system.

DDR Applications

Format	Where Used
Frameless DDR	Application where size and weight must be absolutely minimized
Housed DDR	Applications where the load rides on the motor's bearings such as indexing or rate tables
Cartridge DDR	Any application with existing bearings

Cartridge Direct Drive Rotary (DDR) Motor

The Cartridge DDR Motor is the first in the industry to combine the space-saving and performance advantages of frameless DDR technology with the ease of installation of a full-frame motor. Cartridge DDR motors also feature an advanced electromagnetic design that provides up to 50% more torque density than comparably sized conventional servomotors.

Consisting of a rotor, stator, factory-aligned high-resolution feedback device, the Cartridge DDR motor uses the machine's bearings to support the rotor. An innovative compression coupling secures the Cartridge DDR's rotor to the machine shaft, and the Cartridge DDR's housing is bolted to the machine frame with a bolt circle and pilot – just like a conventional servomotor. Also, mechnical transmission components are eliminated, saving space and design time while simplifying the overall system.

Features	Benefits
• Integrated compression coupling and shipping hardware	• Eliminate parts and labor for a faster and lower cost machine build • Assembles in 5 minutes
• 5 frame sizes, multiple lengths • 230 / 400 / 480 VAC windings available (high and low) • Continuous torque range: 4.57 Nm (3.37 lb-ft) to 510 Nm (373 lb-ft) • Speeds up to 2,500 RPM • Optimized torque output with high-pole count efficient electromagnetic design • Hollow shaft available on C09x and C13x models, provides a 1.26 inch (32mm) through bore to allow process or wiring to run through the center of the motor. Provision for mounting a rotary union to the shaft and housing is included.	• Satisfies a wide range of machine requirements and configurations
• Integrated high-resolution sine encoder • 134,217,728 counts / rev • Low cogging for smooth low-speed rotation • Zero backlash and compliance	• Increased accuracy and higher throughput
• Direct load connection eliminates gearheads, belts, or pulleys	• Greater machine reliability and reduced maintenance • Reduced audible noise, fewer parts and lower cost of ownership • More compact machine and reduced design time

Cartridge DDR Motor

Cartridge DDR Application Considerations

Inertia Matching

Since the Cartridge DDR motor is directly connected to the machine, inertial matching is not required as it is on a conventional motor. With direct drive, inertia miss match of 250 to 1 is common and miss match of 1000 to 1 has been demonstrated.

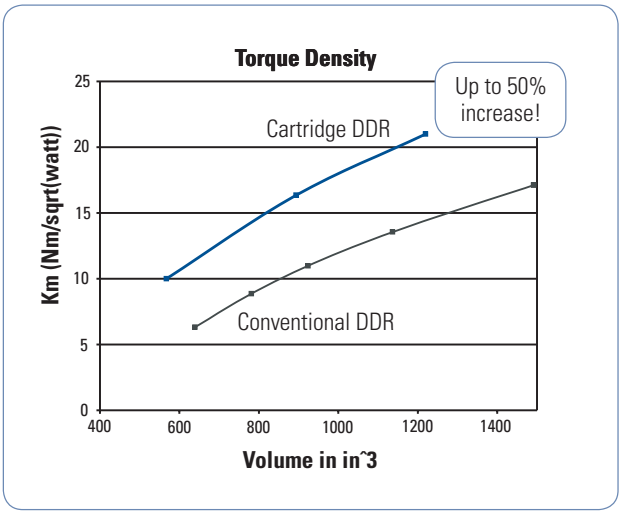
Mounting Orientation

The Cartridge DDR motor can be mounted with any orientation including either a horizontal or vertical shaft.

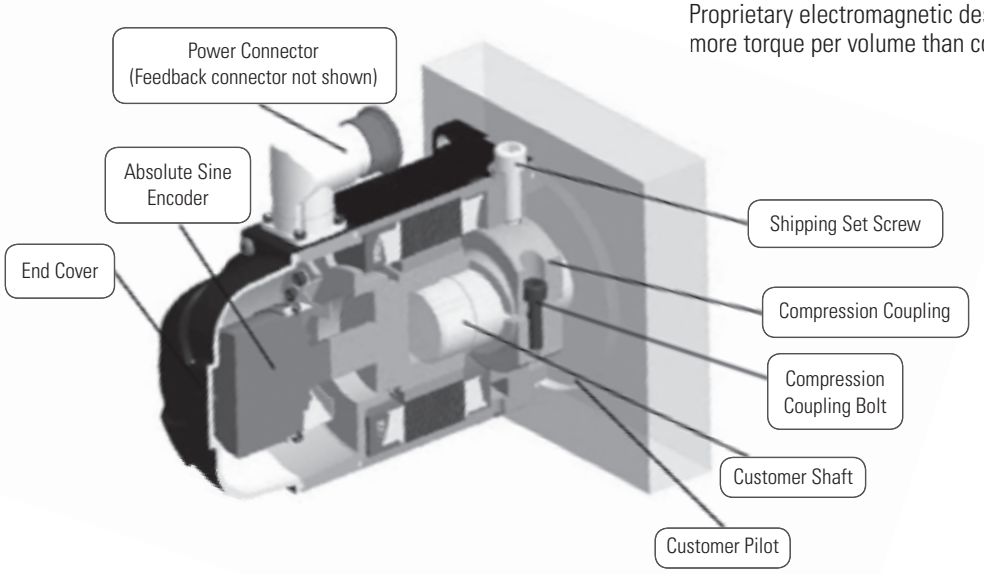
Mounting Cartridge DDR to Machine

Simple and quick procedures to mount:

- Slide the Cartridge DDR motor onto machine shaft
- Bolt Cartridge DDR motor housing to machine frame
- Torque compression coupling
- Remove/store shipping hardware
- Connect cables and run the motor



Proprietary electromagnetic design gives Cartridge DDR motors more torque per volume than conventional DDR technology.



The Cartridge DDR Advantage – Press Feed Machine

Consider how Cartridge DDR technology improves a Press Feed machine:

Reduced Assembly Time

The assembly time for the original mechanical transmission system was 4 hours. In contrast, the Cartridge DDR motor is installed in less than 5 minutes, resulting in a significant cost savings in labor.

Reduced Parts Count

The original mechanical transmission system comprises 2 bracket pieces, 12 bolts, 2 pulleys, 2 set screws, 2 keys, a timing belt, a housing to protect operators from the timing belt, a tension system for the timing belt, and motor/gearhead. With the Cartridge DDR system, this is all replaced by the motor and 4 mounting bolts, resulting in fewer parts to maintain and cost savings.

Improved Accuracy

The best planetary gearheads have a backlash between 1 and 2 arc-minutes. Over the life of the gearhead, the backlash will increase. The Cartridge DDR system has an absolute accuracy of 26 arc-seconds and a repeatability of 0.7 arc-seconds. The Press Feed machine with the Cartridge DDR has a feed accuracy of +/- 0.0005 inch where the Press Feed machine with the mechanical transmission has a feed accuracy of 0.002 inch. Therefore, there was an overall four times improvement in machine accuracy with the Cartridge DDR system.

Increased Throughput

The cycle rate of the Cartridge DDR system is two times better than the mechanical transmission. This results in an increase in throughput of 100 percent.

Improved Reliability and Simplified Maintenance

The Cartridge DDR system eliminates parts that wear, change over time, or fail. Gearheads are prone to wear, and backlash increases over time. Belts and pulleys stretch and require maintenance to maintain proper belt tension. By eliminating these components, the Cartridge DDR system delivers greater system reliability.

Press Feed Example

Gearheads have a finite life span, especially in a demanding cyclic application such as a Press Feed. On this machine, the gearhead must be replaced every 10,000 hours and the belt must be tensioned every 2,000 hours. By contrast, the Cartridge DDR motor has no wear components and requires no maintenance thus simplifying the maintenance schedule for the machine, including operating costs.

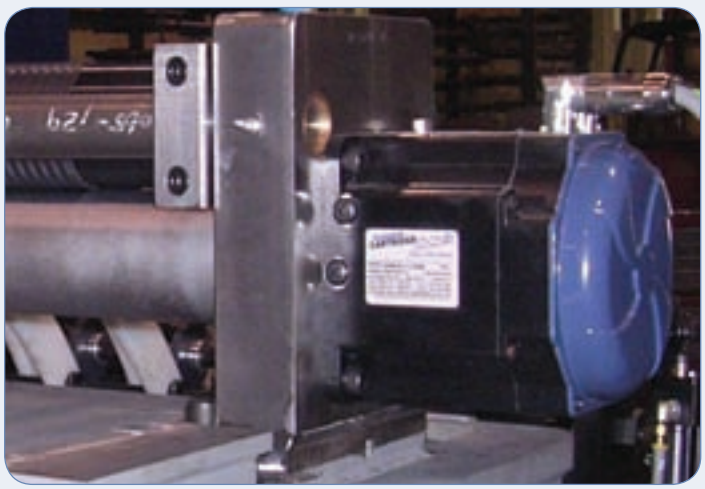
Reduced Audible Noise

The Cartridge DDR system has as much as a 20 dB reduction in noise compared to a mechanical transmission servo system. This can dramatically reduce the overall noise level of the machine. A quieter machine gives the perception of quality. This is rightfully so as the noise emitted by gears and belts is caused by the wearing of the parts.

Total Reduced Cost

A Cartridge DDR motor typically costs 20 percent more than a comparable motor/gearhead combination. However, the elimination of parts and assembly time typically results in a lower total cost for the Cartridge DDR solution.

Press feed machine built with a conventional servomotor, gearhead, belt and pulleys.

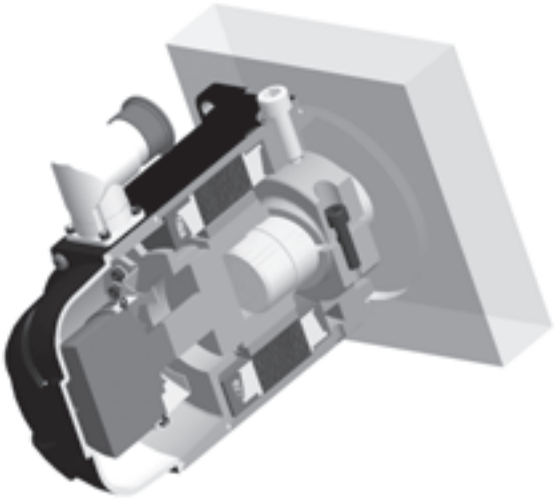


Same machine with a Cartridge DDR motor installed. Here, the shaft of the driven roll is extended into the Cartridge DDR motor and the motor applies torque directly to the driven roll.

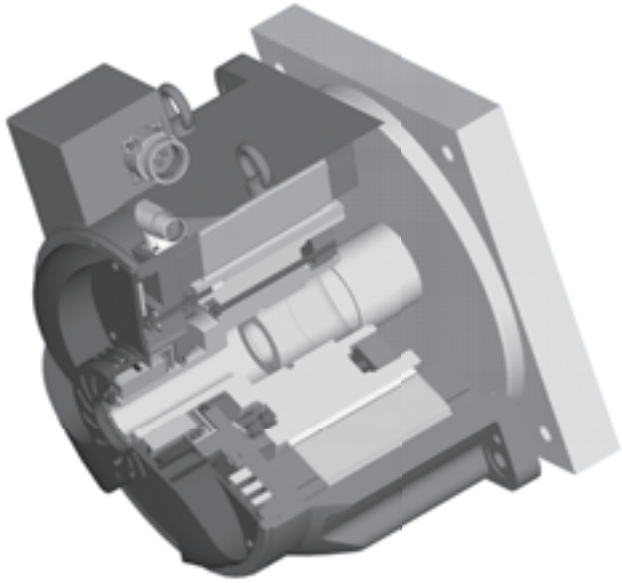
Cartridge DDR System Summary

Due to the large range of continuous and peak torques for the Cartridge DDR series, the mechanical mounting and coupling to the machine varies.

Cross Section of C04x, C05x, C06x



Cross Section of C09x, C13x



Machine Interface Summary

Parameter	C04x, C05x, C06x	C09x, C13x
Coupling Technology	Single bolt split hub, access front motor	Multi-bolt compression, access from rear of motor
Mounting Requirements Shaft TIR	.005" (.13 mm)	.0015" (.038 mm)
Perpendicularity of Machine Mounting Face	.004" (.10 mm)	.002" (.051 mm)
Concentricity of Machine Pilot to Shaft	.004" (.10 mm)	.002" (.051 mm)
Shipping Hardware	Alignment bolt and cap screw	4 set screws and 4 shipping bolts
Mounting Procedure	Procedure # M-RT-S19-07	Procedure # M-RT-019-07

Performance Summary

			Performance Chart Page	AKD Servo Drives					Performance				
									Cont. Torque		Peak Torque		Maximum Speed
				AKD-■0030X	AKD-■0060X	AKD-■0120X	AKD-■0240X	AKD-■0480X*	(N-m)	lb-ft	(N-m)	lb-ft	
Cartridge DDR Motors	240 Volt Systems	C041A	16	•					4.57	3.37	12.3	9.09	1750
		C041B	18		•				4.52	3.33	12.2	9.01	2500
		C042A	16		•				8.25	6.08	22.2	16.4	1700
		C042B	18			•			8.45	6.23	22.8	16.8	2500
		C043A	16		•				11.1	8.20	30.0	22.1	1250
		C043B	18			•			11.2	8.23	30.2	22.2	2500
		C044A	16		•				13.9	10.3	37.4	27.6	1050
		C044B	18			•			14.1	10.4	37.9	28.0	2150
		C051A	19		•				11.7	8.66	30.2	22.3	1200
		C051B	21			•			11.9	8.77	30.6	22.6	2450
		C052C	19		•				16.9	12.5	43.1	31.8	950
		C052D	21			•			16.5	12.2	42.3	31.5	2050
		C053A	19			•			21.0	15.5	54.1	39.9	1350
		C053B	21				•		20.2	14.9	50.1	37.0	2500
		C054A	19			•			24.9	18.4	63.8	47.1	1200
		C054B	21				•		23.8	17.6	61.2	45.1	2350
		C061A	22			•			33.8	24.9	86.8	64.1	900
		C061B	24				•		32.6	24.1	75.6	55.7	1950
		C062C	22			•			48.4	35.7	117	86.5	700
		C062B	24				•		44.6	32.9	102	75.2	1400
		C063C	22			•			61.8	45.6	157	115	550
		C063B	24				•		59.0	43.5	136	100	1050
		C091A	25				•		50.2	37.0	120	88.2	600
		C092C	25				•		102	74.9	231	170	450
		C093C	25				•		139	103	317	233	350
		C131C	27				•		189	139	395	291	250
		C131B	29					•	190	140	396	292	450
		C132C	27				•		362	267	818	603	120
		C132B	29					•	361	266	759	560	225
		C133C	27				•		499	368	1070	791	100
		C133B	29					•	510	376	1090	804	175
	400 / 480 Volt Systems	CH041A	17	•					4.56	3.37	11.3	8.33	2500
		CH042A	17		•				8.26	6.09	19.0	14.0	2500
		CH043A	17		•				11.1	8.20	25.3	18.7	2500[1]
		CH044A	17		•				13.9	10.2	31.6	23.3	2250[1]
		CH051A	20	•					11.7	8.66	28.0	20.7	2500[1]
		CH052C	20	•					16.9	12.5	43.1	31.8	2100
		CH053A	20		•				21.0	15.5	54.1	39.9	2500[1]
		CH054A	20		•				24.9	18.4	63.8	47.1	2500[1]
		CH061A	23		•				33.8	24.9	86.8	64.1	1900[1]
		CH062C	23		•				48.4	35.7	117	86.5	1550[1]
		CH063C	23		•				61.8	45.6	157	115	1150[1]
		CH063B	23			•			59.0	43.5	136	100	2200[1]
		CH091A	26			•			50.2	37.0	120	88.2	1500[1]
		CH092C	26			•			102	74.9	231	170	1000[1]
		CH093C	26			•			139	103	317	233	800[1]
		CH131C	28				•		189	139	395	291	600[1]
		CH131B	30					•	190	140	396	292	1000[1]
		CH132C	28				•		362	267	818	603	300[1]
		CH132B	30					•	361	266	759	560	500[1]
		CH133C	28				•		499	368	1070	791	250[1]
		CH133B	30					•	510	376	1090	804	400[1]

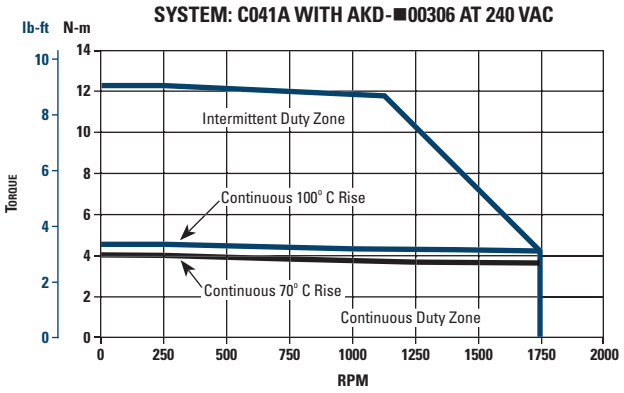
1. Maximum speed at 480 Vac. For maximum speed at 400 Vac see performance curve.
* Available Q4, 2010.

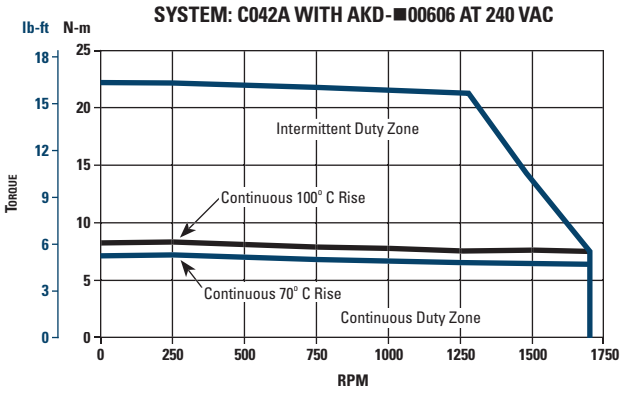
Technical Performance Data

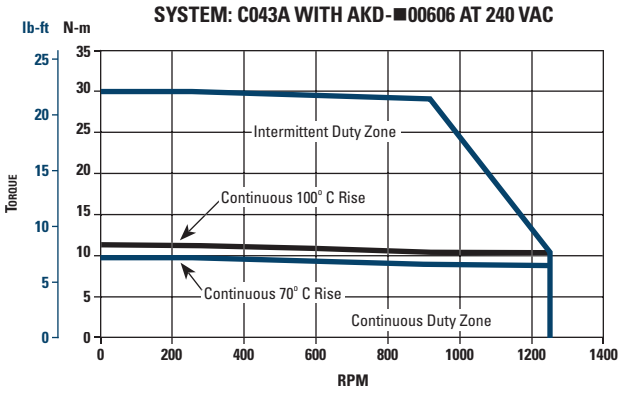
C04xA

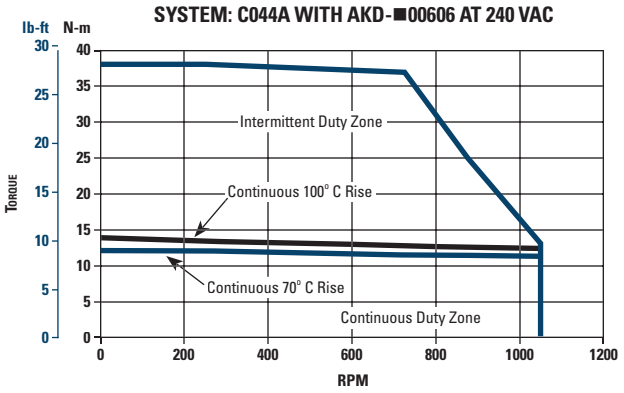
System Performance at 240 VAC C04xA Cartridge DDR Motor with AKD Servo Drive Series Amplifier

System Performance	Symbol	Units	C041A	C042A	C043A	C044A
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	3.37 (4.57)	6.08 (8.25)	8.20 (11.1)	10.3 (13.9)
Cont. Line Current	Ic	amps RMS	2.73	4.68	4.73	4.91
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	2.93 (3.97)	5.30 (7.19)	7.14 (9.68)	9.14 (12.4)
Cont. Line Current	Ic	amps RMS	2.38	4.08	4.13	4.37
Peak Torque	Tp	lb-ft (N-m)	9.09 (12.3)	16.4 (22.2)	22.1 (30.0)	27.6 (37.4)
Peak Line Current	Ip	amps RMS	8.20	14.0	14.2	14.7
Maximum Speed	N max	RPM	1750	1700	1250	1050
Weight	Wt	lb (kg)	9.00 (4.08)	12.5 (5.67)	16.0 (7.26)	19.5 (8.84)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.083 (5.86)	0.126 (8.87)	0.168 (11.9)	0.211 (14.9)







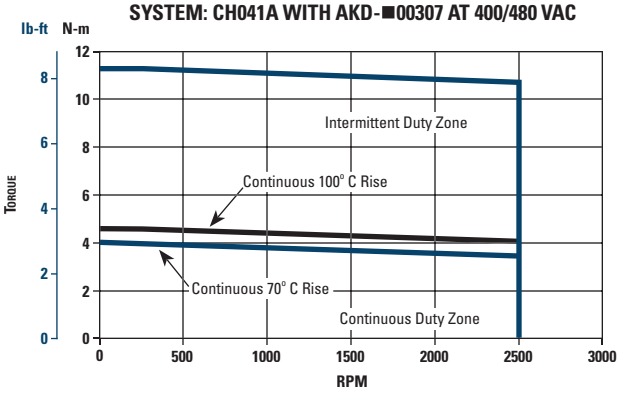


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 12 x 12 x 0.50 inch aluminum mounting plate or equivalent.

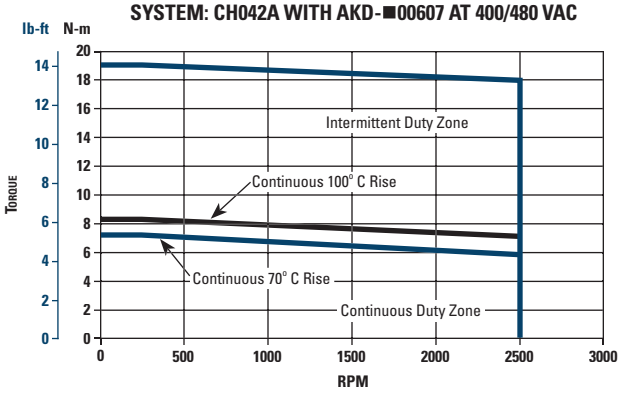
System Performance at 400/480 VAC CH04xA Cartridge DDR Motor with AKD Servo Drive Series Amplifier

System Performance	Symbol	Units	CH041A	CH042A	CH043A	CH044A
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	3.37 (4.56)	6.09 (8.26)	8.20 (11.1)	10.2 (13.9)
Cont. Line Current	Ic	amps RMS	2.73	4.68	4.73	4.90
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	2.93 (3.97)	5.30 (7.19)	7.14 (9.68)	9.14 (12.4)
Cont. Line Current	Ic	amps RMS	2.38	4.08	4.13	4.30
Peak Torque	Tp	lb-ft (N-m)	8.33 (11.3)	14.0 (19.0)	18.7 (25.3)	23.3 (31.6)
Peak Line Current	Ip	amps RMS	7.50	12.0	12.0	12.0
Maximum Speed (400 V) Maximum Speed (480 V)	N max	RPM	2500 2500	2500 2500	2250 2500	1850 2250
Weight	Wt	lb (kg)	9.00 (4.08)	12.5 (5.67)	16.0 (7.26)	19.5 (8.84)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.083 (5.86)	0.126 (8.87)	0.168 (11.9)	0.211 (14.9)

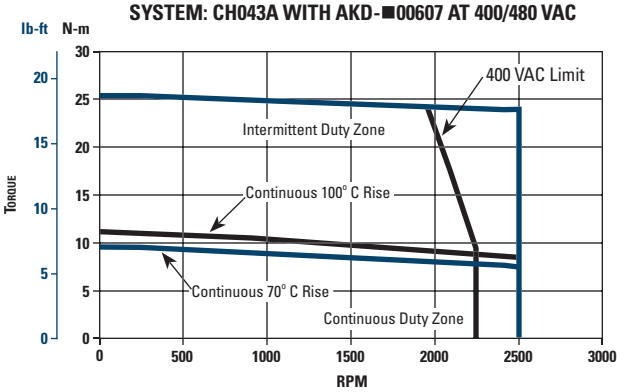
SYSTEM: CH041A WITH AKD-■00307 AT 400/480 VAC



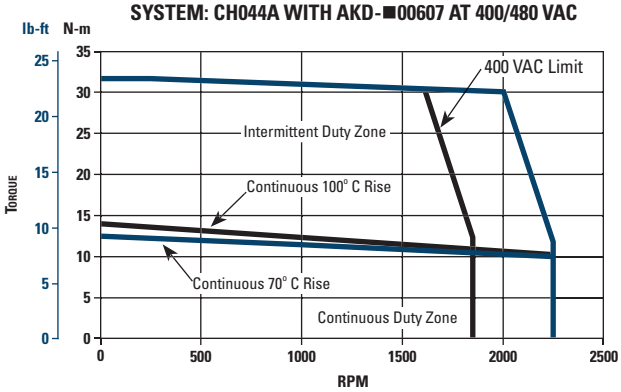
SYSTEM: CH042A WITH AKD-■00607 AT 400/480 VAC



SYSTEM: CH043A WITH AKD-■00607 AT 400/480 VAC



SYSTEM: CH044A WITH AKD-■00607 AT 400/480 VAC



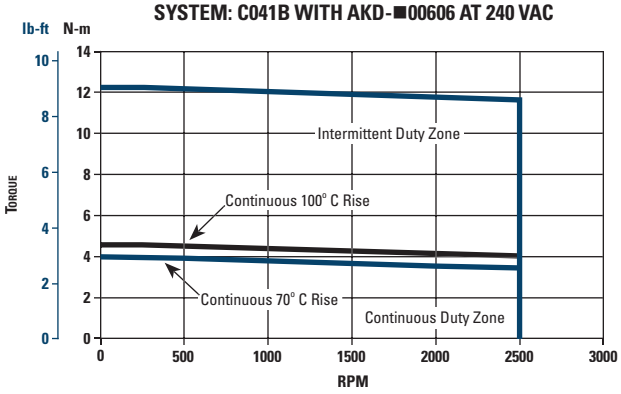
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 12 x 12 x 0.50 inch aluminum mounting plate or equivalent.

C04xB

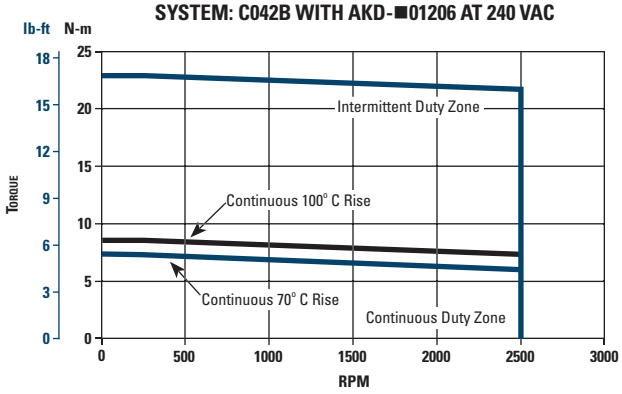
System Performance at 240 VAC C04xB Cartridge DDR Motor (High-Speed Winding) with AKD Servo Drive Series Amplifiers

System Performance	Symbol	Units	C041B	C042B	C043B	C044B
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	3.33 (4.52)	6.23 (8.45)	8.23 (11.2)	10.4 (14.1)
Cont. Line Current	Ic	amps RMS	4.69	9.19	9.15	9.53
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	2.91 (3.94)	5.43 (7.36)	7.17 (9.73)	9.22 (12.5)
Cont. Line Current	Ic	amps RMS	4.09	8.01	7.98	8.50
Peak Torque	Tp	lb-ft (N-m)	9.01 (12.2)	16.8 (22.8)	22.2 (30.2)	28.0 (37.9)
Peak Line Current	Ip	amps RMS	14.1	27.6	27.5	28.6
Maximum Speed	N max	RPM	2500	2500	2500	2150
Weight	Wt	lb (kg)	9.00 (4.08)	12.5 (5.67)	16.0 (7.26)	19.5 (8.84)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.083 (5.86)	0.126 (8.87)	0.168 (11.9)	0.211 (14.9)

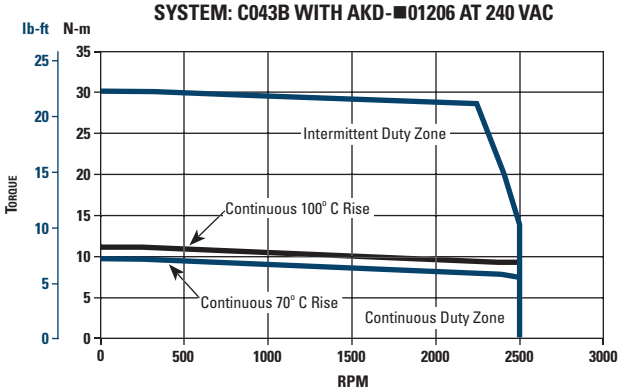
SYSTEM: C041B WITH AKD-■00606 AT 240 VAC



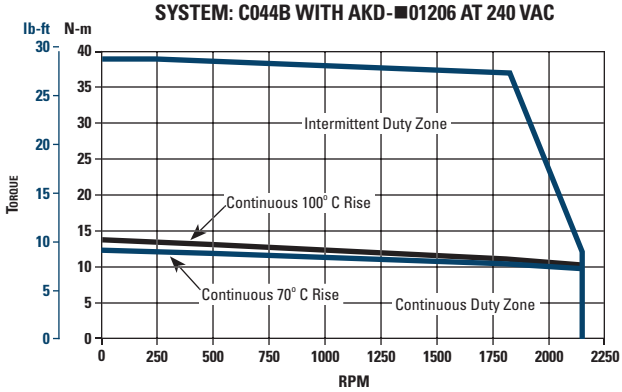
SYSTEM: C042B WITH AKD-■01206 AT 240 VAC



SYSTEM: C043B WITH AKD-■01206 AT 240 VAC



SYSTEM: C044B WITH AKD-■01206 AT 240 VAC

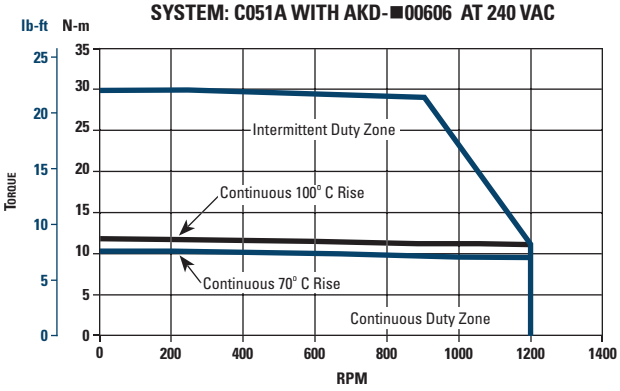


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 12 x 12 x 0.50 inch aluminum mounting plate or equivalent.

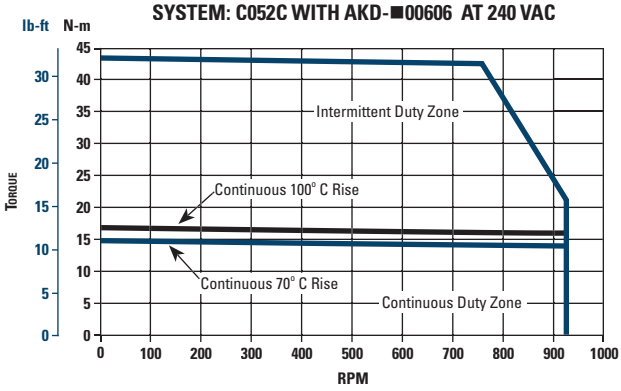
System Performance at 240 VAC C05xA/C Cartridge DDR Motor with AKD Servo Drive Series Amplifiers

System Performance	Symbol	Units	C051A	C052C	C053A	C054A
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	8.66 (11.7)	12.5 (16.9)	15.5 (21.0)	18.4 (24.9)
Cont. Line Current	Ic	amps RMS	4.78	5.73	9.28	9.82
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	7.54 (10.2)	10.8 (14.7)	13.5 (18.3)	16.1 (21.8)
Cont. Line Current	Ic	amps RMS	4.17	5.00	8.10	8.62
Peak Torque	Tp	lb-ft (N-m)	22.3 (30.2)	31.8 (43.1)	39.9 (54.1)	47.1 (63.8)
Peak Line Current	Ip	amps RMS	12.9	15.5	25.1	26.5
Maximum Speed	N max	RPM	1200	950	1350	1200
Weight	Wt	lb (kg)	18.5 (8.39)	23.5 (10.7)	29.0 (13.2)	34.0 (15.4)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.388 (27.4)	0.508 (35.9)	0.628 (44.3)	0.748 (52.8)

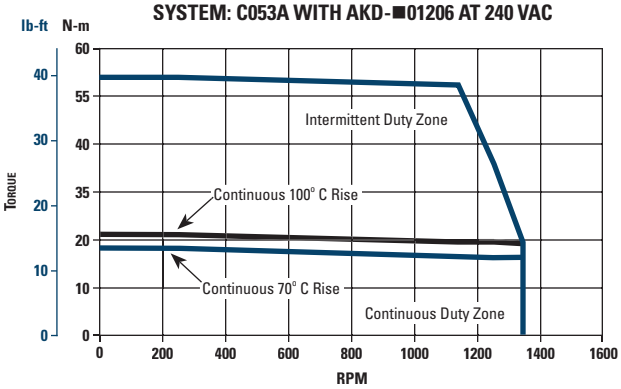
SYSTEM: C051A WITH AKD-■00606 AT 240 VAC



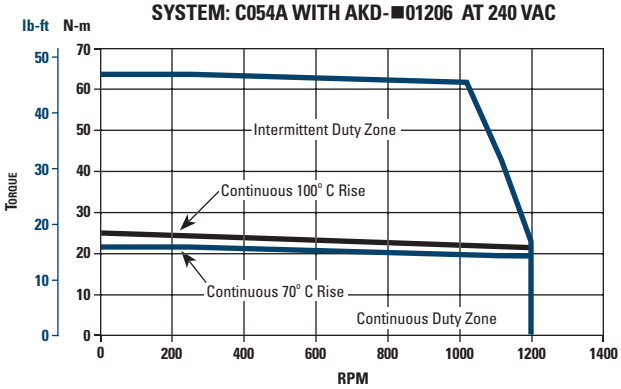
SYSTEM: C052C WITH AKD-■00606 AT 240 VAC



SYSTEM: C053A WITH AKD-■01206 AT 240 VAC



SYSTEM: C054A WITH AKD-■01206 AT 240 VAC



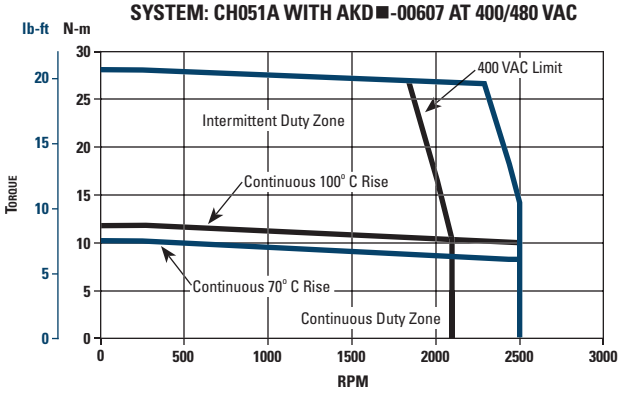
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

CH05xA

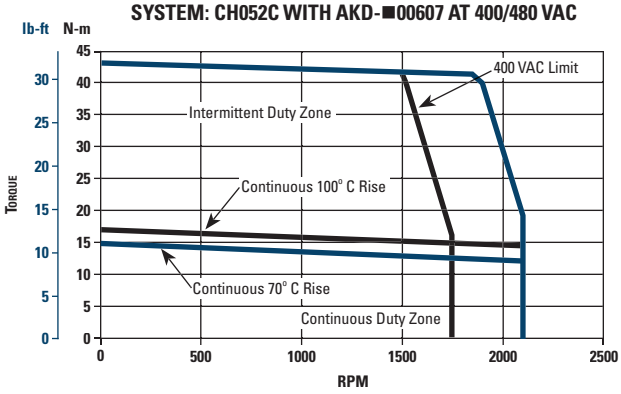
System Performance at 400/480 VAC CH05xA/C Cartridge DDR Motor with AKD Servo Drive Series Amplifiers

System Performance	Symbol	Units	CH051A	CH052C	CH053A	CH054A
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	8.66 (11.7)	12.5 (16.9)	15.5 (21.0)	18.4 (24.9)
Cont. Line Current	Ic	amps RMS	4.78	5.73	9.28	9.82
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	7.54 (10.2)	10.8 (14.7)	13.5 (18.3)	16.1 (21.8)
Cont. Line Current	Ic	amps RMS	4.17	5.00	8.10	8.62
Peak Torque	Tp	lb-ft (N-m)	20.7 (28.0)	31.8 (43.1)	39.9 (54.1)	47.1 (63.8)
Peak Line Current	Ip	amps RMS	12.0	15.5	25.1	26.5
Maximum Speed (400 V) Maximum Speed (480 V)	N max	RPM	2100 2500	1750 2100	2350 2500	2100 2500
Weight	Wt	lb (kg)	18.5 (8.39)	23.5 (10.7)	29.0 (13.2)	34.0 (15.4)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.388 (27.4)	0.508 (35.9)	0.628 (44.3)	0.748 (52.8)

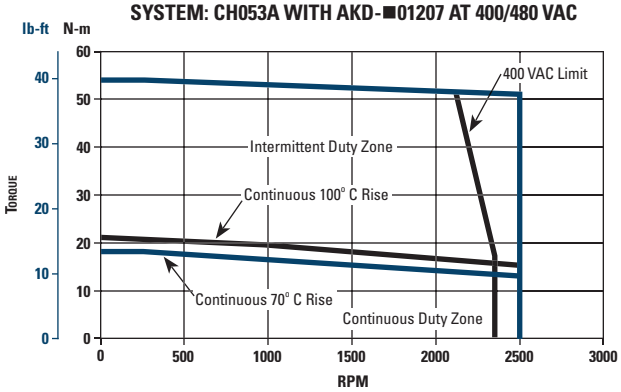
SYSTEM: CH051A WITH AKD■-00607 AT 400/480 VAC



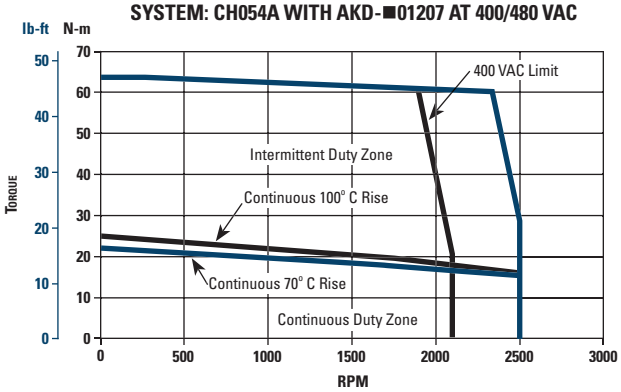
SYSTEM: CH052C WITH AKD-■00607 AT 400/480 VAC



SYSTEM: CH053A WITH AKD-■01207 AT 400/480 VAC



SYSTEM: CH054A WITH AKD-■01207 AT 400/480 VAC

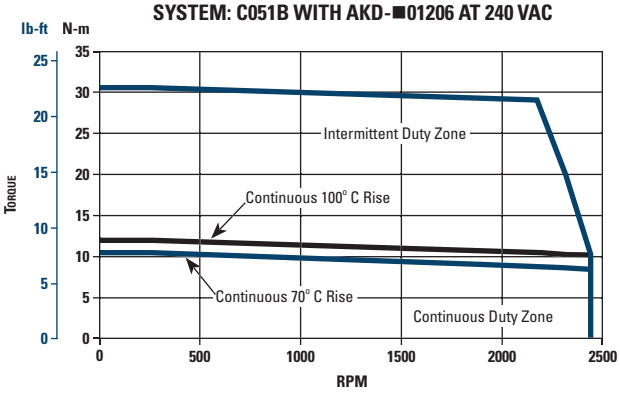


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

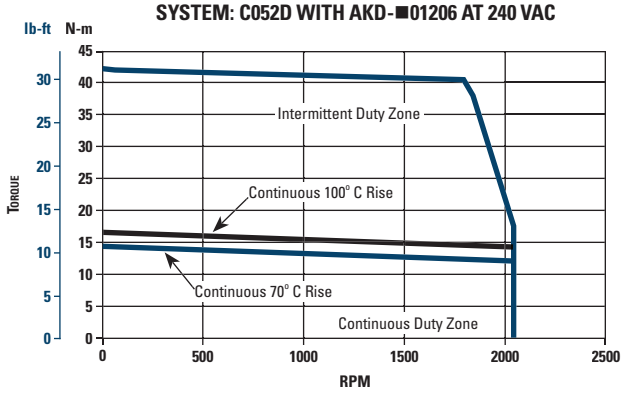
System Performance at 240 VAC C05xB/D Cartridge DDR Motor (High-Speed Winding) with AKD Servo Drive Series Amplifiers

System Performance	Symbol	Units	C051B	C052D	C053B	C054B
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	8.77 (11.9)	12.2 (16.5)	14.9 (20.2)	17.6 (23.8)
Cont. Line Current	Ic	amps RMS	9.34	10.9	18.4	17.4
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	7.63 (10.4)	10.6 (14.4)	12.9 (17.6)	15.4 (20.9)
Cont. Line Current	Ic	amps RMS	8.15	9.55	16.0	15.3
Peak Torque	Tp	lb-ft (N-m)	22.6 (30.6)	31.2 (42.3)	37.0 (50.1)	45.1 (61.2)
Peak Line Current	Ip	amps RMS	25.2	29.6	48.0	47.0
Maximum Speed	N max	RPM	2450	2050	2500	2350
Weight	Wt	lb (kg)	18.5 (8.39)	23.5 (10.7)	29.0 (13.2)	34.0 (15.4)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	0.388 (27.4)	0.508 (35.9)	0.628 (44.3)	0.748 (52.8)

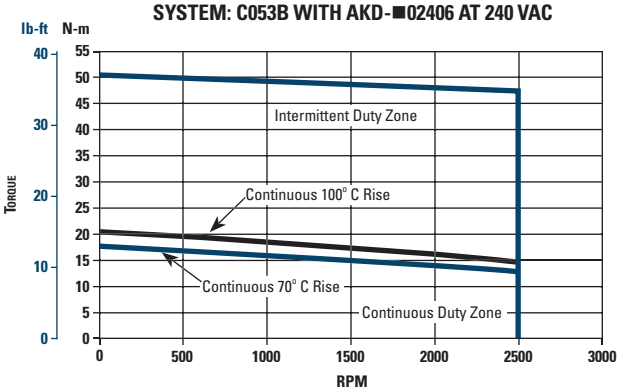
SYSTEM: C051B WITH AKD-■01206 AT 240 VAC



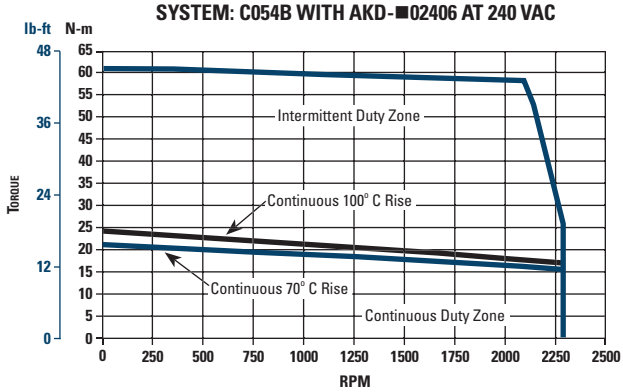
SYSTEM: C052D WITH AKD-■01206 AT 240 VAC



SYSTEM: C053B WITH AKD-■02406 AT 240 VAC



SYSTEM: C054B WITH AKD-■02406 AT 240 VAC



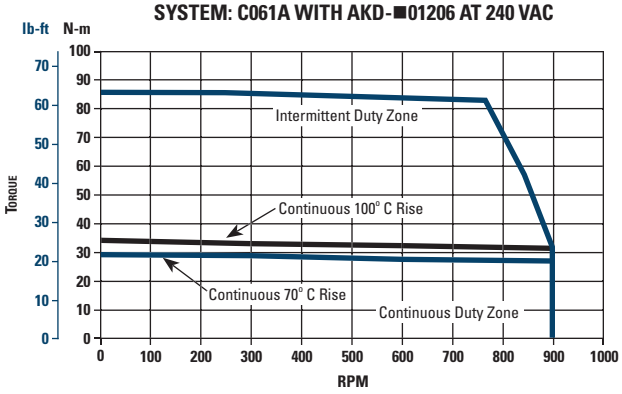
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

C06xA/C

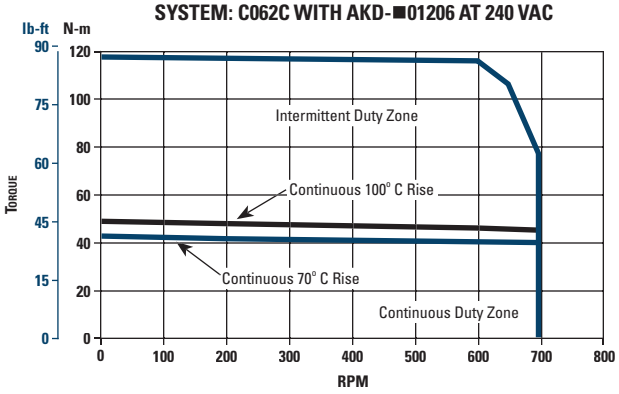
System Performance at 240 VAC C06xA/C Cartridge DDR Motor with AKD Servo Drive Series Amplifiers

System Performance	Symbol	Units	C061A	C062C	C063C
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	24.9 (33.8)	35.7 (48.4)	45.6 (61.8)
Cont. Line Current	Ic	amps RMS	10.0	11.8	11.3
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	21.7 (29.4)	31.1 (42.2)	39.7 (53.9)
Cont. Line Current	Ic	amps RMS	8.72	10.3	9.84
Peak Torque	Tp	lb-ft (N-m)	64.1 (86.8)	86.5 (117)	115 (157)
Peak Line Current	Ip	amps RMS	27.0	30.0	30.0
Maximum Speed	N max	RPM	900	700	550
Weight	Wt	lb (kg)	41.0 (18.6)	52.0 (23.6)	63.0 (29.0)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	1.33 (94.1)	1.78 (126)	2.23 (157)

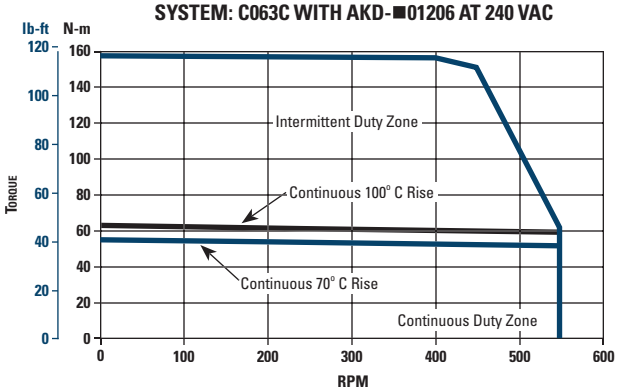
SYSTEM: C061A WITH AKD-■01206 AT 240 VAC



SYSTEM: C062C WITH AKD-■01206 AT 240 VAC



SYSTEM: C063C WITH AKD-■01206 AT 240 VAC

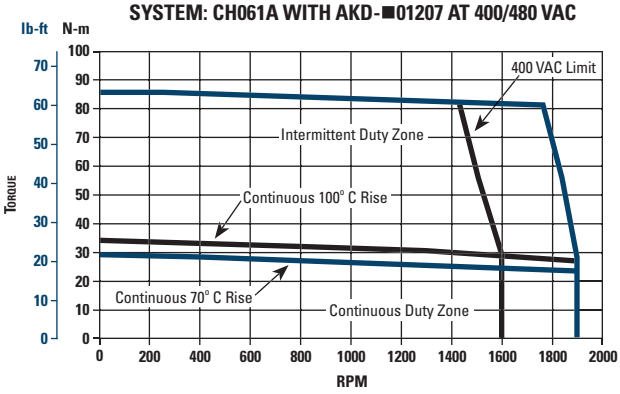


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

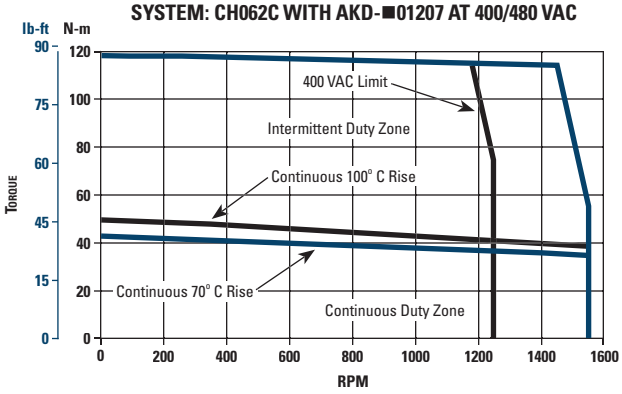
System Performance at 400 / 480 VAC CH06x Cartridge DDR Motor with AKD Servo Drive Series Amplifier

System Performance	Symbol	Units	CH061A	CH062C	CH063C	CH063B
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	24.9 (33.8)	35.7 (48.4)	45.6 (61.8)	43.5 (59.0)
Cont. Line Current	Ic	amps RMS	10.0	11.8	11.3	19.8
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	21.7 (29.4)	31.1 (42.2)	39.7 (53.9)	37.9 (51.4)
Cont. Line Current	Ic	amps RMS	8.72	10.3	9.84	17.3
Peak Torque	Tp	lb-ft (N-m)	64.1 (86.8)	86.5 (117)	115 (157)	100 (136)
Peak Line Current	Ip	amps RMS	27.0	30.0	30.0	48.0
Maximum Speed (400 V) Maximum Speed (480 V)	N max	RPM	1600 1900	1250 1550	950 1150	1850 2200
Weight	Wt	lb (kg)	41.0 (18.6)	52.0 (23.6)	63.0 (29.0)	63.0 (29.0)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	1.33 (94.1)	1.78 (126)	2.23 (157)	2.23 (157)

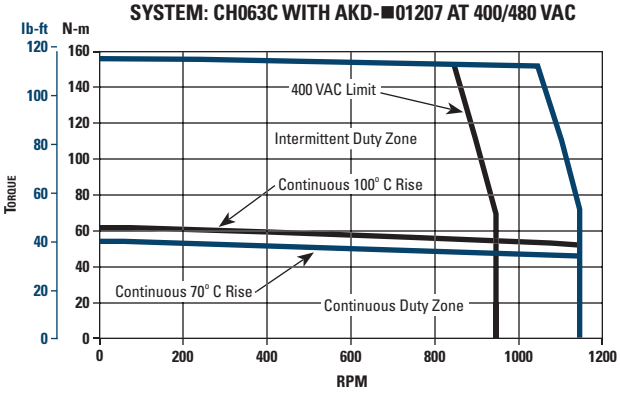
SYSTEM: CH061A WITH AKD-■01207 AT 400/480 VAC



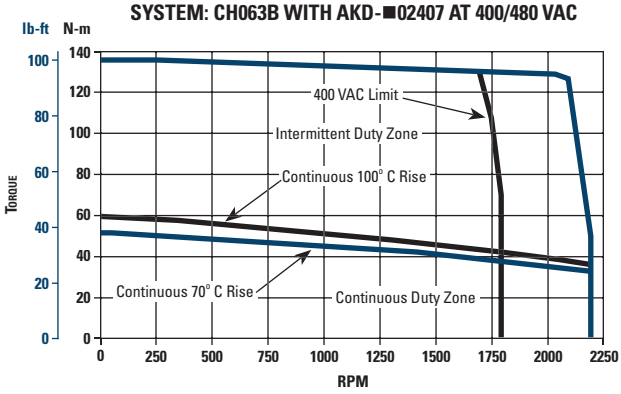
SYSTEM: CH062C WITH AKD-■01207 AT 400/480 VAC



SYSTEM: CH063C WITH AKD-■01207 AT 400/480 VAC



SYSTEM: CH063B WITH AKD-■02407 AT 400/480 VAC



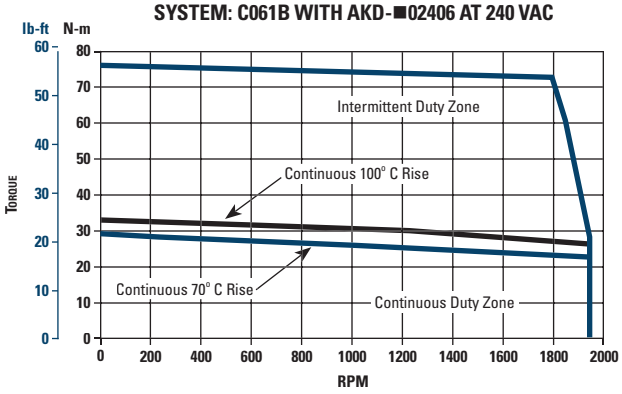
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

C06xB

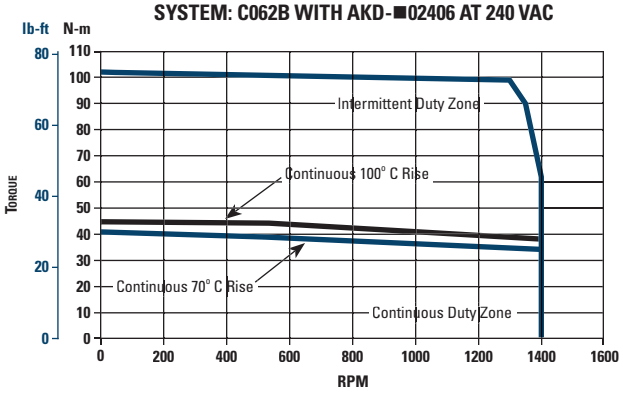
System Performance at 240 VAC C06xB Cartridge DDR Motor (High-Speed Winding) with AKD Servo Drive Series Amplifier

System Performance	Symbol	Units	C061B	C062B	C063B
Continuous Torque 100°C Rise[123]	Tc	lb-ft (N-m)	24.1 (32.6)	32.9 (44.6)	43.5 (59.0)
Cont. Line Current	Ic	amps RMS	19.7	20.0	19.8
Continuous Torque 70°C Rise[123]	Tc	lb-ft (N-m)	21.0 (28.4)	29.9 (40.5)	37.9 (51.4)
Cont. Line Current	Ic	amps RMS	17.2	18.2	17.3
Peak Torque	Tp	lb-ft (N-m)	55.7 (75.6)	75.2 (102)	100 (136)
Peak Line Current	Ip	amps RMS	48.0	48.0	48.0
Maximum Speed	N max	RPM	1950	1400	1050
Weight	Wt	lb (kg)	41.0 (18.6)	52.0 (23.6)	63.0 (29.0)
Rotor Inertia	Jm	oz-in-sec^2 (kg-cm^2)	1.33 (94.1)	1.78 (126)	2.23 (157)

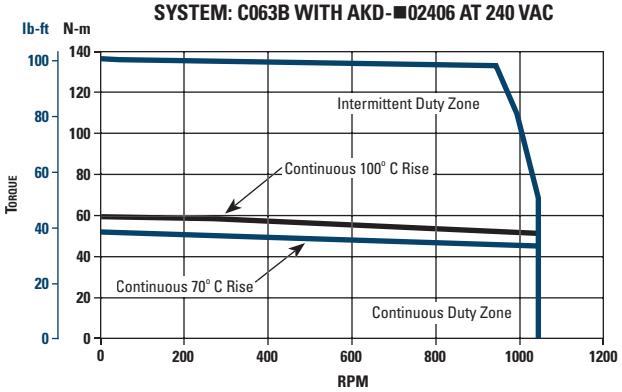
SYSTEM: C061B WITH AKD-■02406 AT 240 VAC



SYSTEM: C062B WITH AKD-■02406 AT 240 VAC



SYSTEM: C063B WITH AKD-■02406 AT 240 VAC

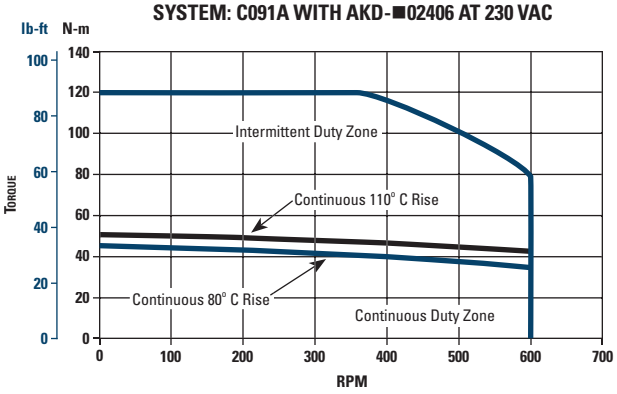


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 18 x 18 x 0.50 inch aluminum mounting plate or equivalent.

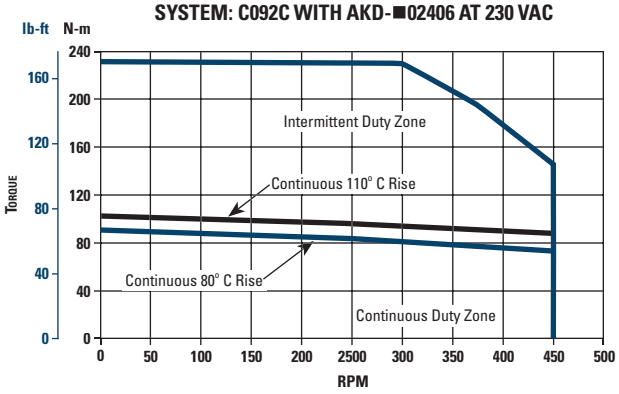
System Performance at 230 VAC C09xA/C Cartridge DDR Motor with AKD Drive Amplifiers

System Performance	Symbol	Units	C091A	C092C	C093C
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	37.0 (50.2)	74.9 (102)	103 (139)
Cont. Line Current	Ic	amps RMS	12.8	18.1	20.0
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	33.0 (44.7)	66.5 (90.1)	95.0 (129)
Cont. Line Current	Ic	amps RMS	11.4	13.7	15.6
Peak Torque	Tp	lb-ft (N-m)	88.2 (120)	170 (231)	234 (317)
Peak Line Current	Ip	amps RMS	40.0	48.0	48.0
Maximum Speed	N max	RPM	600	450	350
Weight	Wt	lb (kg)	61.0 (27.7)	91.0 (41.3)	120 (54.4)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.021 (0.028)	0.035 (0.047)	0.049 (0.066)

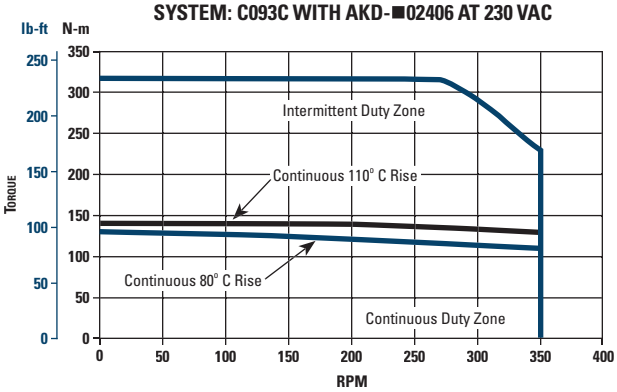
SYSTEM: C091A WITH AKD-■02406 AT 230 VAC



SYSTEM: C092C WITH AKD-■02406 AT 230 VAC



SYSTEM: C093C WITH AKD-■02406 AT 230 VAC



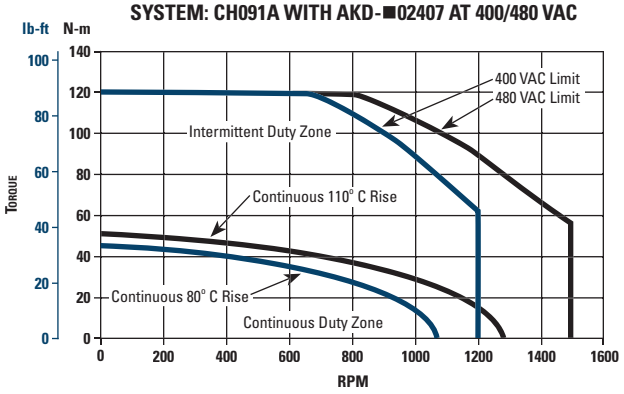
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 16 x 16 x 0.75 inch aluminum mounting plate or equivalent.

CH09xA/C

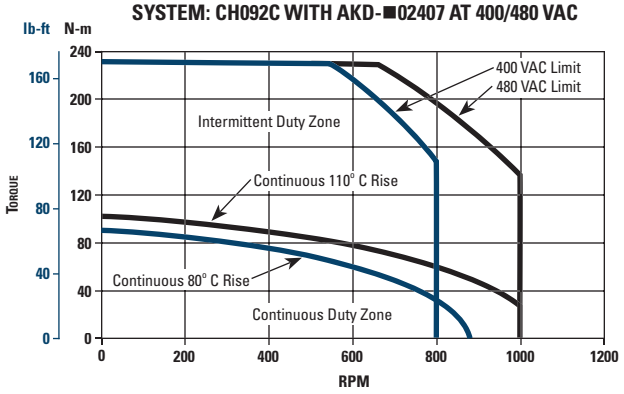
System Performance at 400 /480 VAC CH09xA/C Cartridge DDR Motor with AKD Drive Amplifier

System Performance	Symbol	Units	CH091A	CH092C	CH093C
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	37.0 (50.2)	74.9 (102)	103 (139)
Cont. Line Current	Ic	amps RMS	12.8	18.1	20.0
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	33.0 (44.7)	66.5 (90.1)	95.0 (129)
Cont. Line Current	Ic	amps RMS	11.4	13.7	15.6
Peak Torque	Tp	lb-ft (N-m)	88.2 (120)	170 (231)	228 (309)
Peak Line Current	Ip	amps RMS	40.0	48.0	48.0
Maximum Speed (400V) Maximum Speed (480V)	N max	RPM	1200 1500	800 1000	700 800
Weight	Wt	lb (kg)	61.0 (27.7)	91.0 (41.3)	120 (54.4)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.021 (0.028)	0.035 (0.047)	0.049 (0.066)

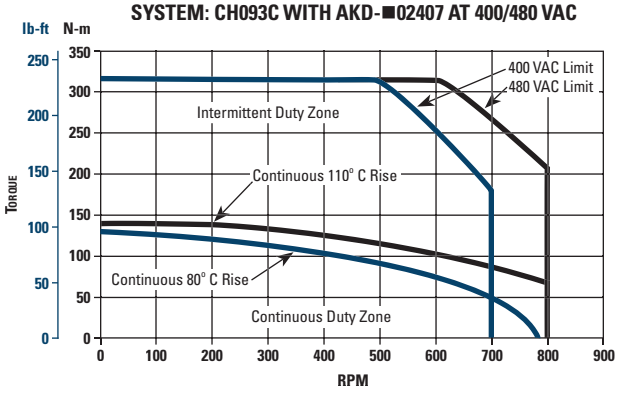
SYSTEM: CH091A WITH AKD-■02407 AT 400/480 VAC



SYSTEM: CH092C WITH AKD-■02407 AT 400/480 VAC



SYSTEM: CH093C WITH AKD-■02407 AT 400/480 VAC

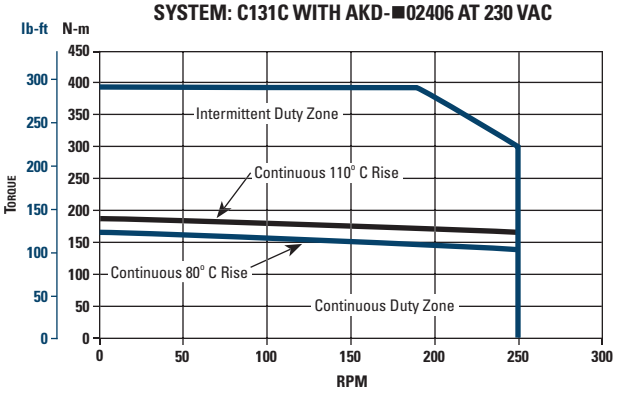


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 16 x 16 x 0.75 inch aluminum mounting plate or equivalent.

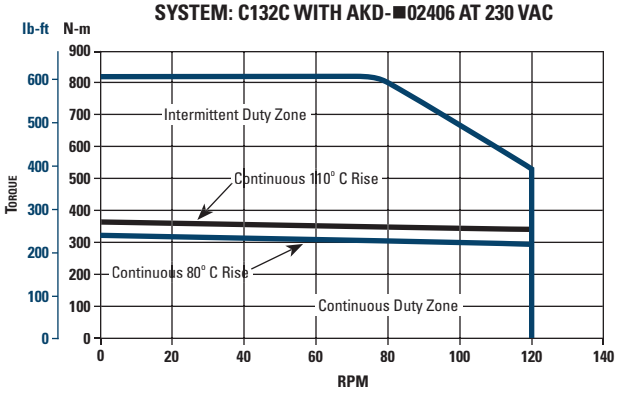
System Performance at 230 VAC C13xC Cartridge DDR Motor with AKD Drive Amplifier

System Performance	Symbol	Units	C131C	C132C	C133C
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	139 (189)	267 (362)	368 (499)
Cont. Line Current	Ic	amps RMS	18.8	16.9	20.0
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	123 (167)	236 (321)	330 (448)
Cont. Line Current	Ic	amps RMS	16.6	15.0	17.9
Peak Torque	Tp	lb-ft (N-m)	291 (395)	603 (818)	791 (1070)
Peak Line Current	Ip	amps RMS	48.0	48.0	48.0
Maximum Speed	N max	RPM	250	120	100
Weight	Wt	lb (kg)	140 (63.5)	223 (101)	292 (132)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.091 (0.124)	0.166 (0.225)	0.223 (0.302)

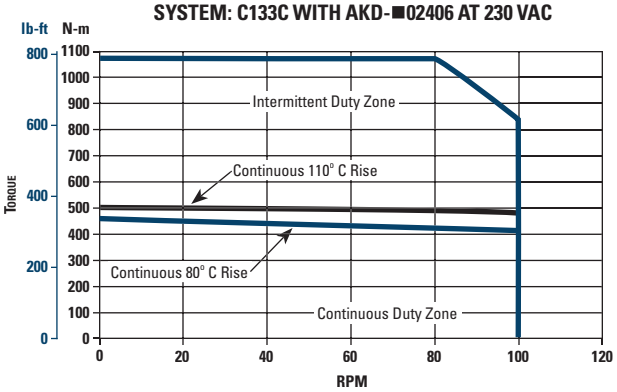
SYSTEM: C131C WITH AKD-■02406 AT 230 VAC



SYSTEM: C132C WITH AKD-■02406 AT 230 VAC



SYSTEM: C133C WITH AKD-■02406 AT 230 VAC



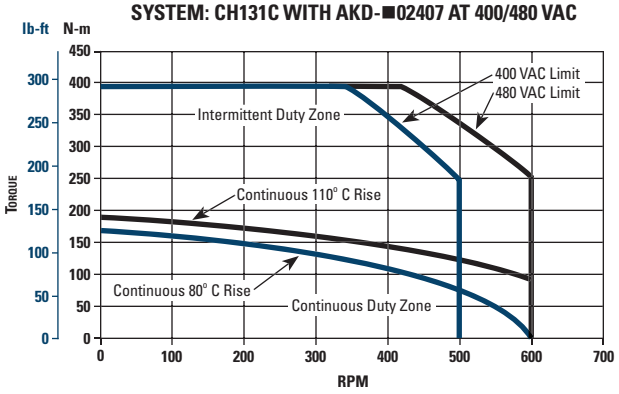
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 20 x 20 x 0.75 inch aluminum mounting plate or equivalent.

CH13xC

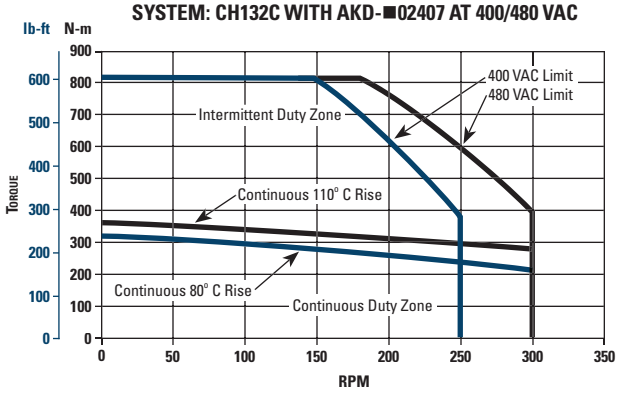
System Performance at 400 /480 VAC CH13xC Cartridge DDR Motor with AKD Drive Amplifier

System Performance	Symbol	Units	CH131C	CH132C	CH133C
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	139 (189)	267 (362)	368 (499)
Cont. Line Current	Ic	amps RMS	18.8	16.9	20.0
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	123 (167)	236 (321)	330 (448)
Cont. Line Current	Ic	amps RMS	16.6	15.0	17.9
Peak Torque	Tp	lb-ft (N-m)	291 (395)	603 (818)	791 (1070)
Peak Line Current	Ip	amps RMS	48.0	48.0	48.0
Maximum Speed (400V) Maximum Speed (480V)	N max	RPM	500 600	250 300	200 250
Weight	Wt	lb (kg)	140 (63.5)	223 (101)	292 (132)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.091 (0.124)	0.166 (0.225)	0.223 (0.302)

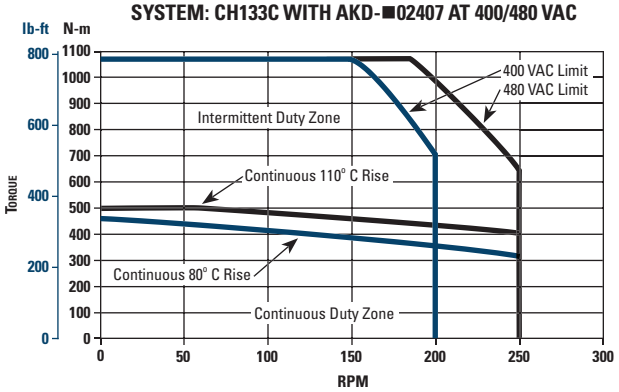
SYSTEM: CH131C WITH AKD-■02407 AT 400/480 VAC



SYSTEM: CH132C WITH AKD-■02407 AT 400/480 VAC



SYSTEM: CH133C WITH AKD-■02407 AT 400/480 VAC

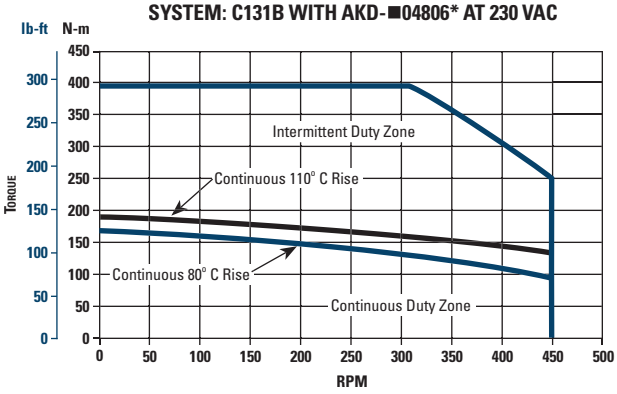


Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 20 x 20 x 0.75 inch aluminum mounting plate or equivalent.

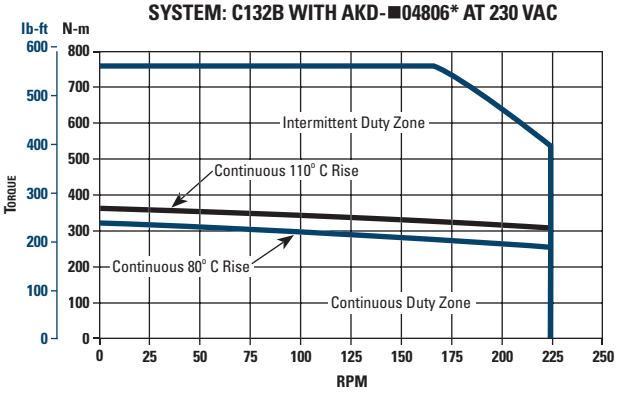
System Performance at 230 VAC C13xB Cartridge DDR Motor (High-Speed Winding) with AKD Drive Amplifier

System Performance	Symbol	Units	C131B	C132B	C133B
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	140 (190)	266 (361)	376 (510)
Cont. Line Current	Ic	amps RMS	29.2	29.6	32.7
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	124 (168)	236 (320)	333 (451)
Cont. Line Current	Ic	amps RMS	25.9	26.3	29.0
Peak Torque	Tp	lb-ft (N-m)	292 (396)	560 (759)	804 (1090)
Peak Line Current	Ip	amps RMS	80.0	80.0	96.0
Maximum Speed	N max	RPM	450	225	175
Weight	Wt	lb (kg)	140 (63.5)	223 (101)	292 (132)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.091 (0.124)	0.166 (0.225)	0.223 (0.302)

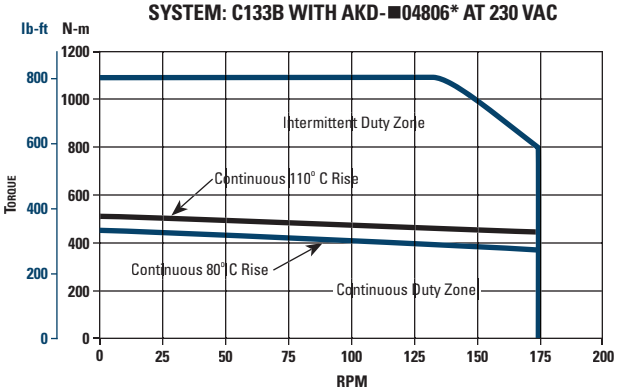
SYSTEM: C131B WITH AKD-■04806* AT 230 VAC



SYSTEM: C132B WITH AKD-■04806* AT 230 VAC



SYSTEM: C133B WITH AKD-■04806* AT 230 VAC



*Available Q4, 2010.

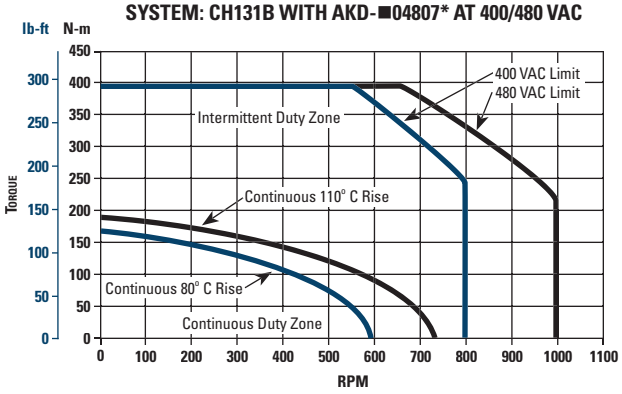
Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 20 x 20 x 0.75 inch aluminum mounting plate or equivalent.

CH13xB

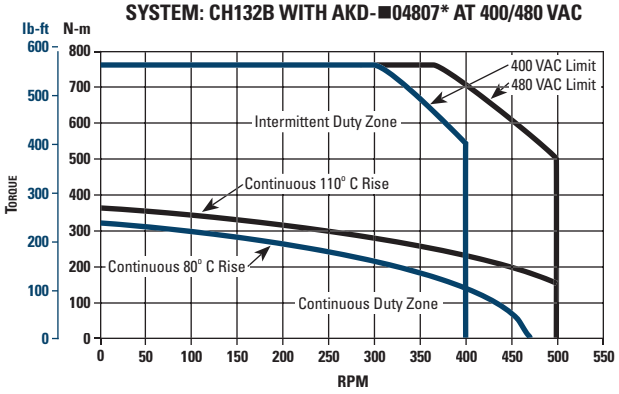
System Performance at 400 /480 VAC CH13xB Cartridge DDR Motor (High-Speed Winding) with AKD Drive Amplifier

System Performance	Symbol	Units	CH131B	CH132B	CH133B
Continuous Torque 110°C Rise	Tc	lb-ft (N-m)	140 (190)	266 (361)	372 (510)
Cont. Line Current	Ic	amps RMS	29.2	29.6	32.7
Continuous Torque 80°C Rise	Tc	lb-ft (N-m)	124 (168)	236 (320)	333 (451)
Cont. Line Current	Ic	amps RMS	25.9	26.3	29.0
Peak Torque	Tp	lb-ft (N-m)	292 (396)	560 (759)	804 (1090)
Peak Line Current	Ip	amps RMS	80.0	80.0	96.0
Maximum Speed (400V) Maximum Speed (480V)	N max	RPM	800 1000	400 500	350 400
Weight	Wt	lb (kg)	140 (63.5)	223 (101)	292 (132)
Rotor Inertia	Jm	lb-ft-sec^2 (kg-m^2)	0.091 (0.124)	0.166 (0.225)	0.223 (0.302)

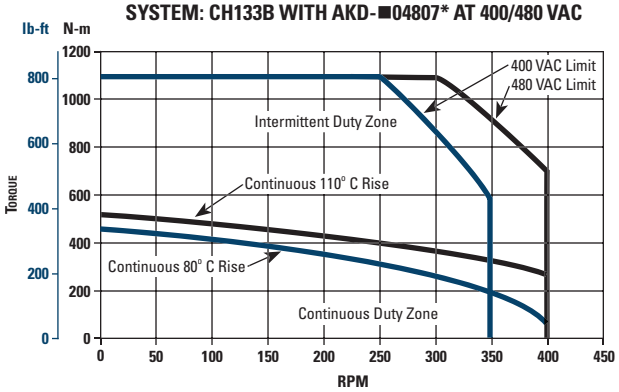
SYSTEM: CH131B WITH AKD-■04807* AT 400/480 VAC



SYSTEM: CH132B WITH AKD-■04807* AT 400/480 VAC



SYSTEM: CH133B WITH AKD-■04807* AT 400/480 VAC

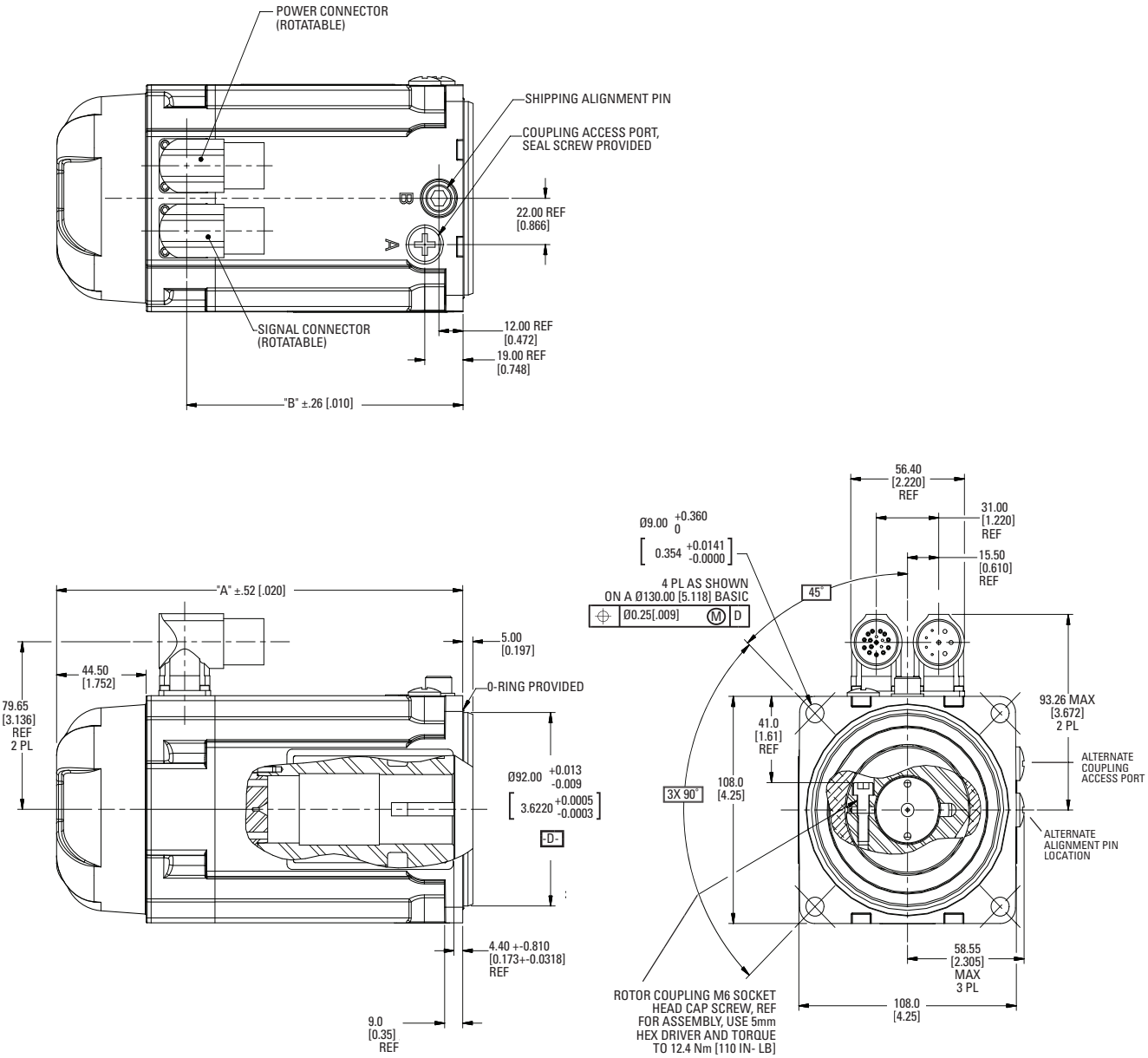


*Available Q4, 2010.

Notes:
1. At 40°C ambient.
2. Increase Tc by 1.06 times for 25°C ambient.
3. Temperature rise assumes a 20 x 20 x 0.75 inch aluminum mounting plate or equivalent.

Outline Drawings

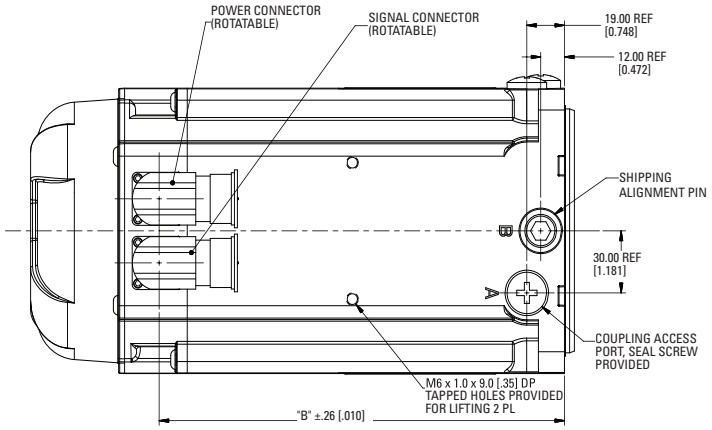
C(H)04x

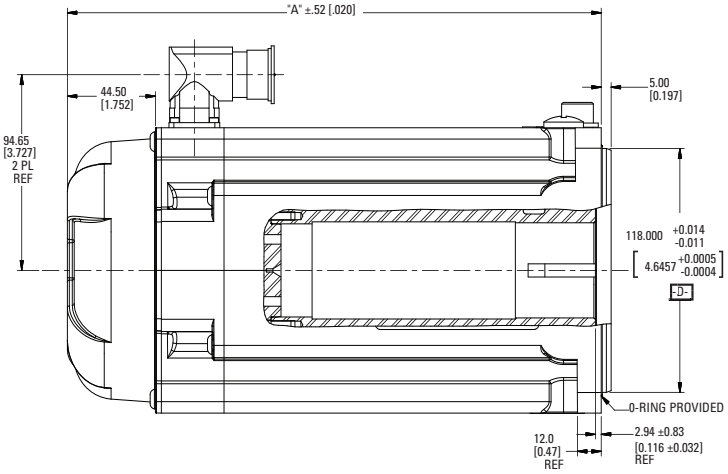


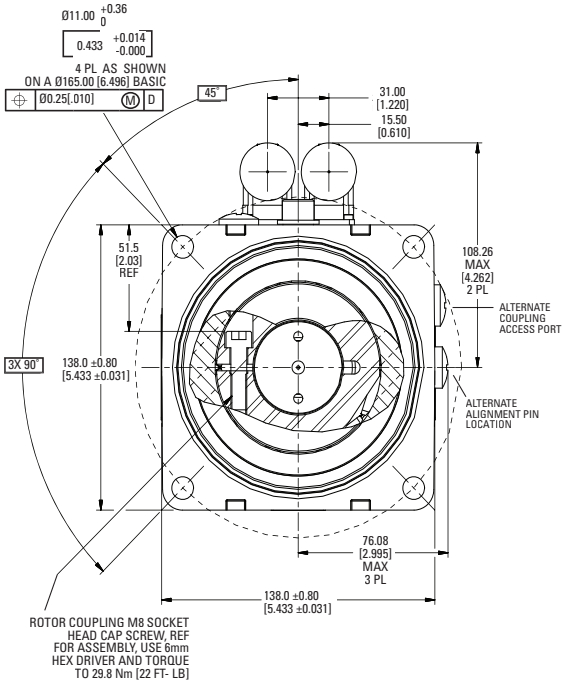
		C041	C042	C043	C044
Dim A	mm (inches)	171 (6.72)	202 (7.94)	233 (9.16)	264 (10.4)
Dim B	mm (inches)	107 (4.22)	138 (5.44)	169 (6.66)	200 (7.88)

For machine interface detail, see page 38

C(H)05x

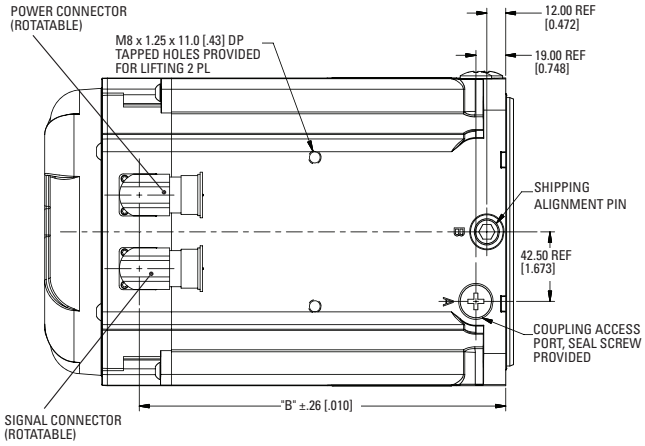


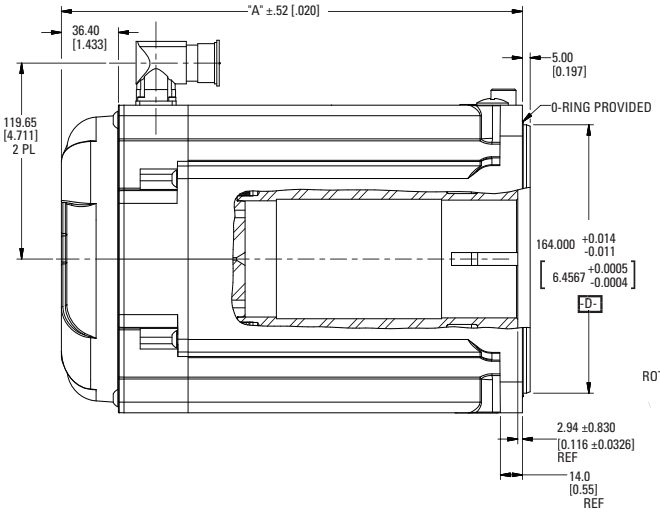


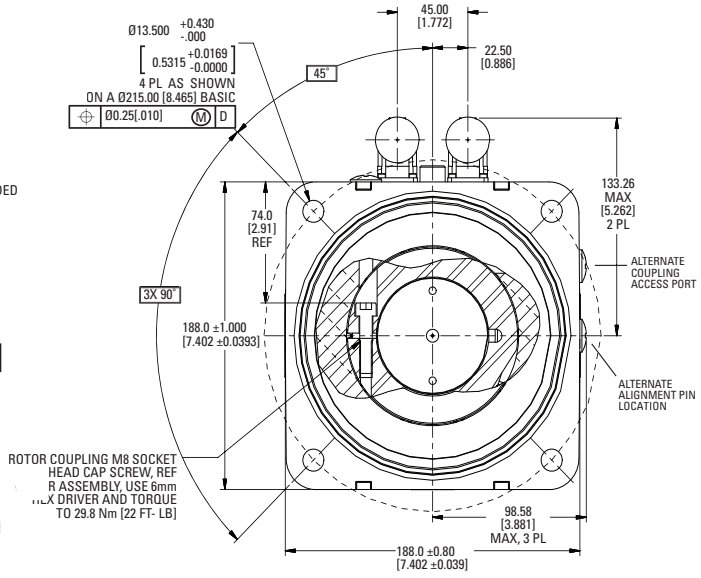


		C051	C052	C053	C054
Dim A	mm (inches)	195 (7.67)	220 (8.65)	245 (9.63)	270 (10.6)
Dim B	mm (inches)	131 (5.14)	156 (6.12)	181 (7.11)	206 (8.09)

For machine interface detail, see page 38



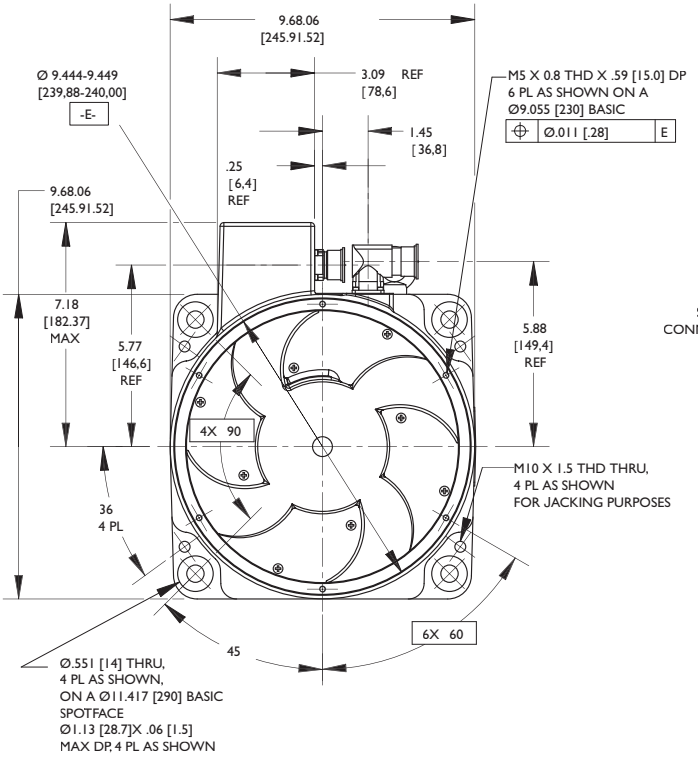


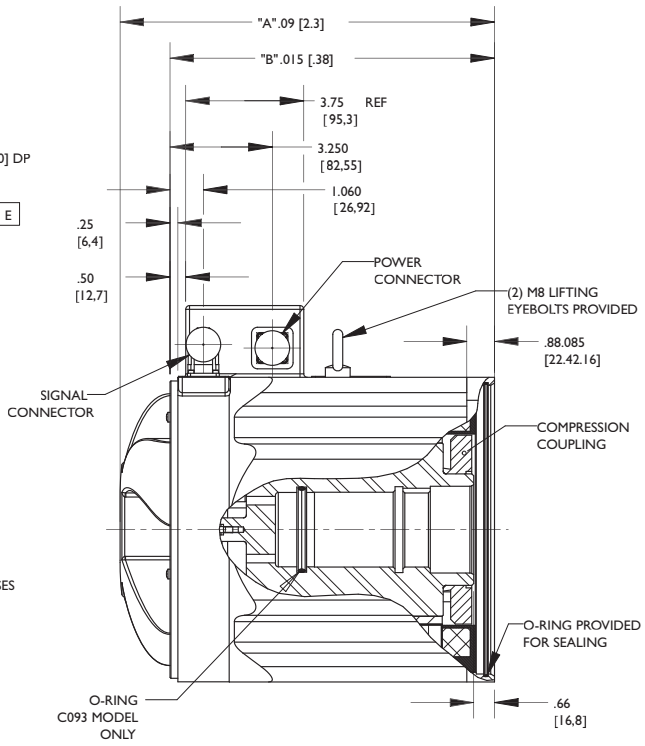


		C061	C062	C063
Dim A	mm (inches)	226 (8.90)	260 (10.2)	294 (11.6)
Dim B	mm (inches)	166 (6.52)	200 (7.86)	234 (9.20)

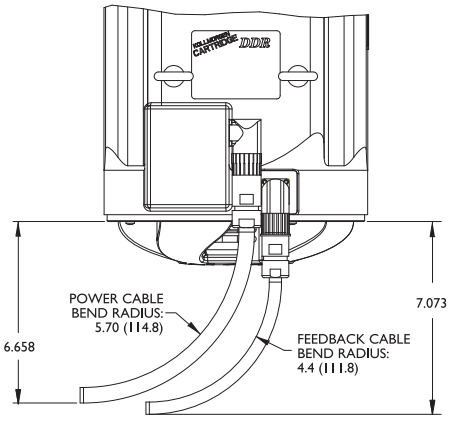
For machine interface detail, see page 38

C(H)09x without Through Bore

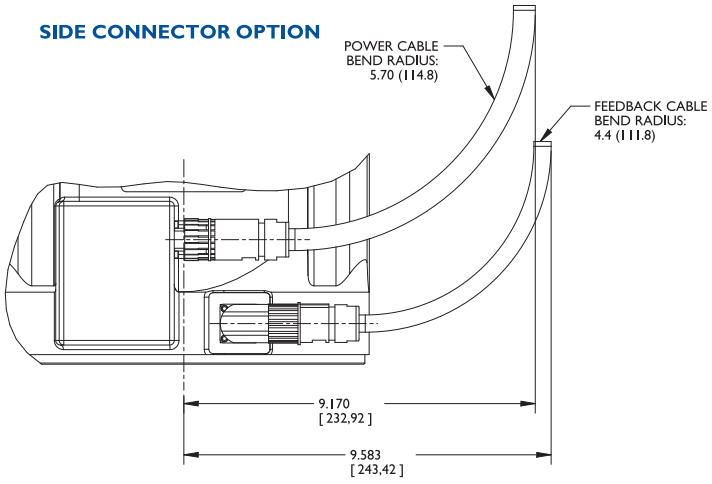




REAR CONNECTOR OPTION



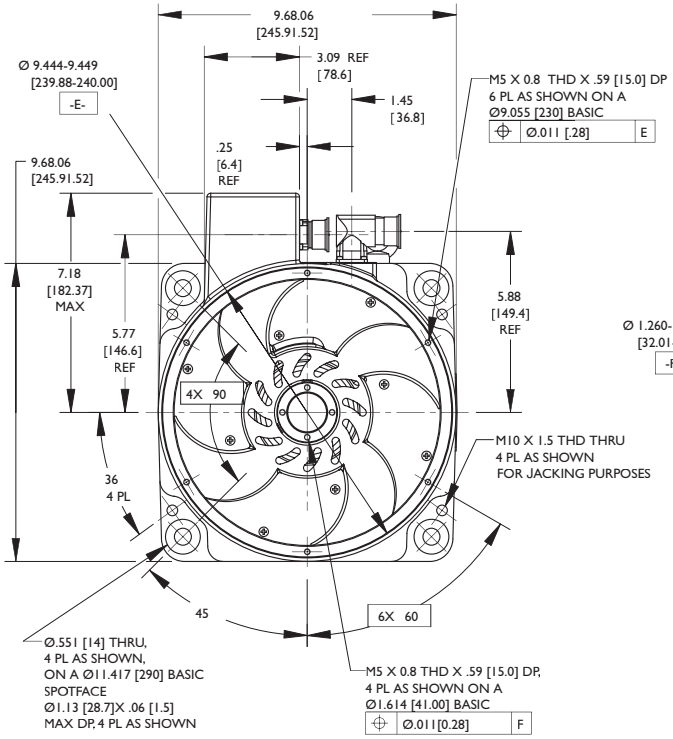
SIDE CONNECTOR OPTION

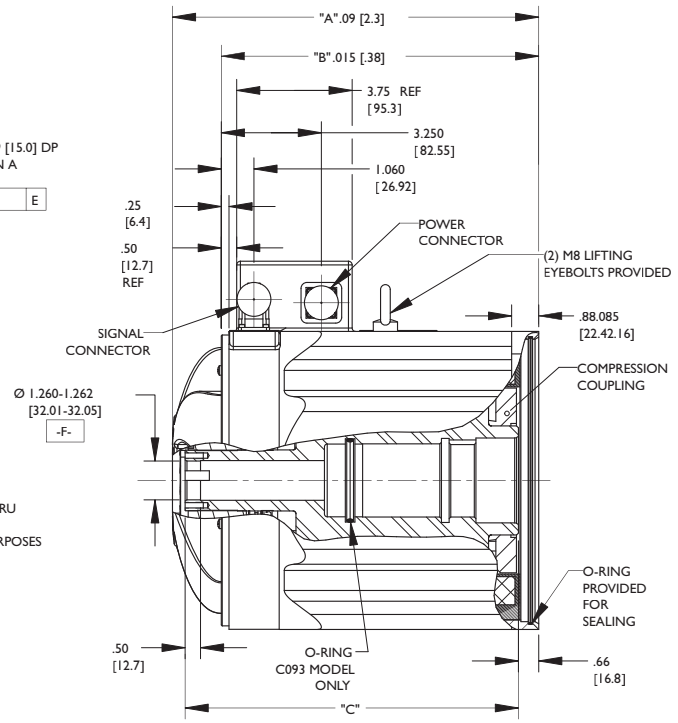


		C(H)091	C(H)092	C(H)093
Dim A	mm (inches)	204 (7.99)	253 (9.94)	302 (11.9)
Dim B	mm (inches)	163 (6.40)	212 (8.36)	262 (10.3)

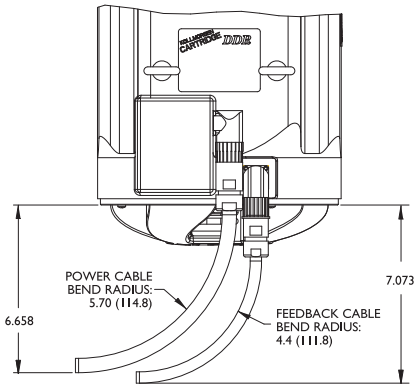
For machine interface detail, see page 39

C(H)09X with Through Bore

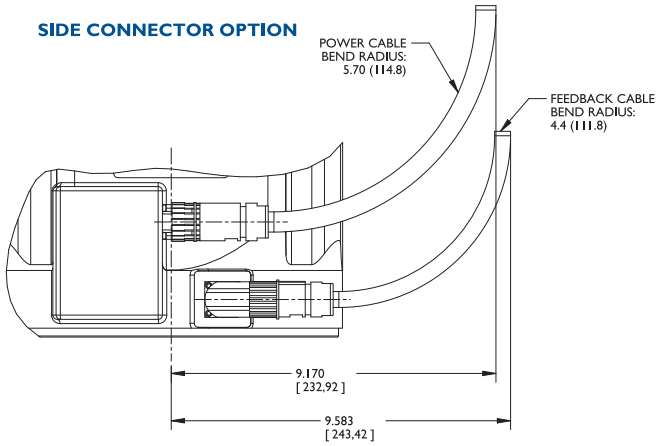




REAR CONNECTOR OPTION



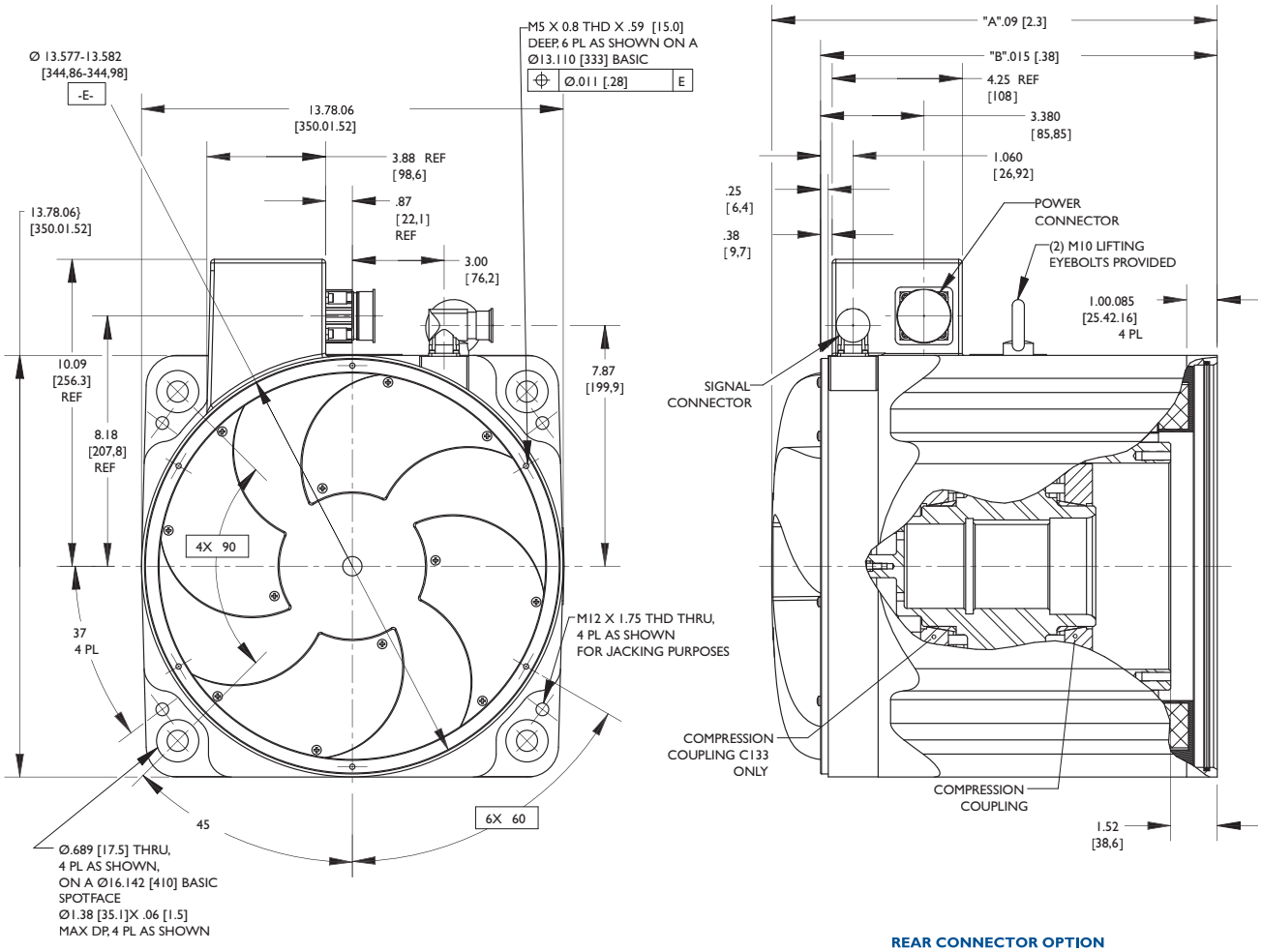
SIDE CONNECTOR OPTION



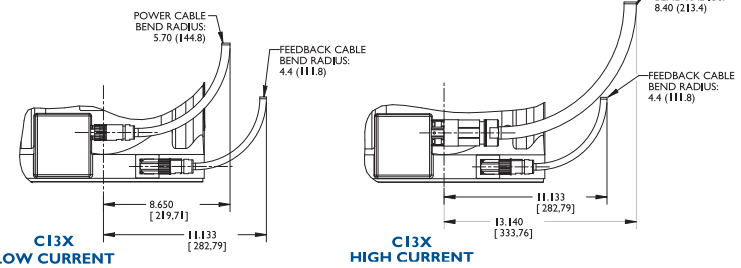
		C(H)091	C(H)092	C(H)093
Dim A	mm (inches)	204 (7.99)	253 (9.94)	302 (11.9)
Dim B	mm (inches)	163 (6.40)	212 (8.36)	262 (10.3)
Dim C	mm (inches)	176 (6.92)	225 (8.87)	275 (10.8)

For machine interface detail, see page 39

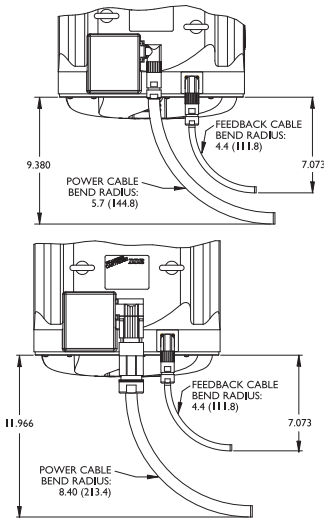
C(H)13X without Through Bore



SIDE CONNECTOR OPTION



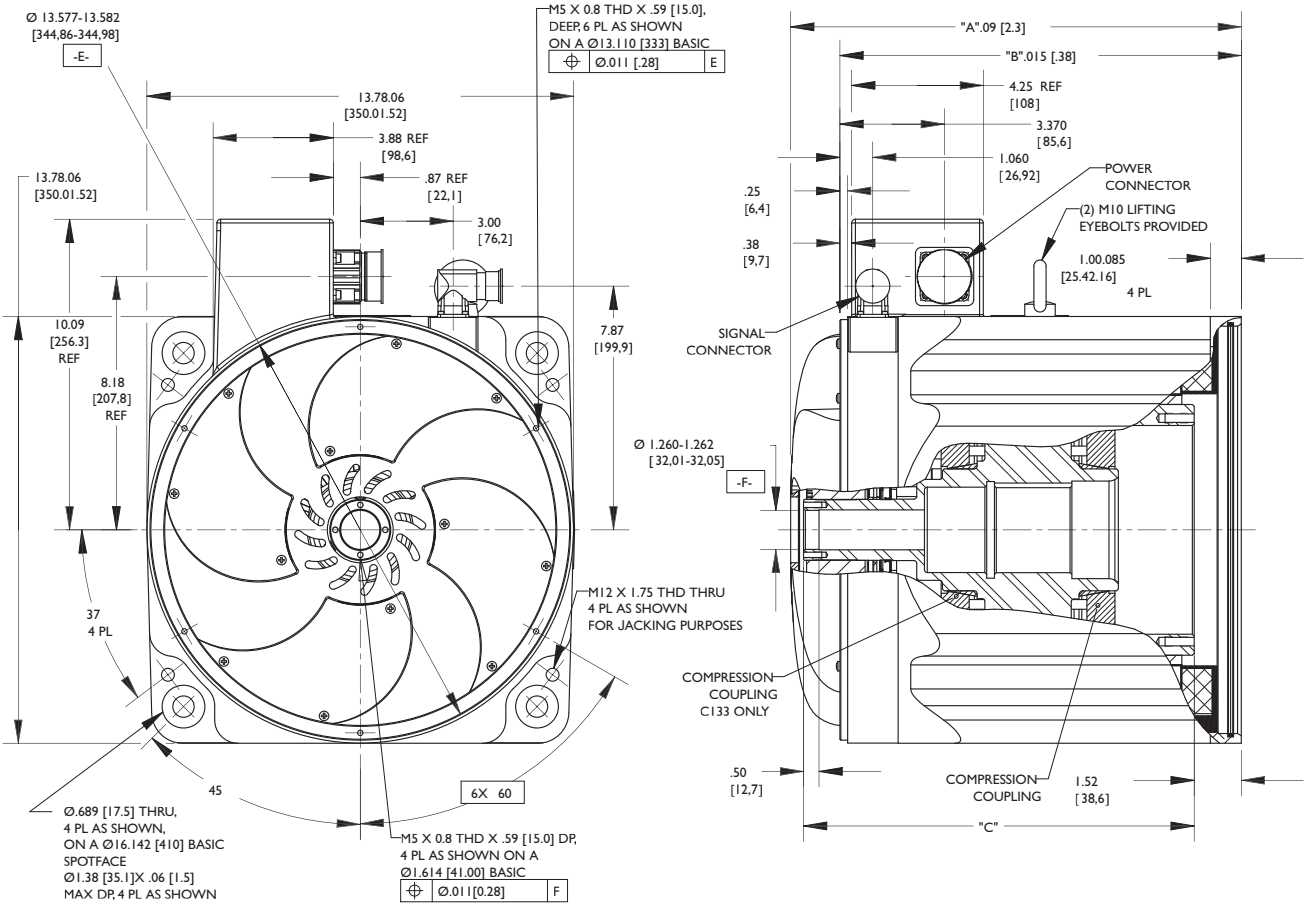
REAR CONNECTOR OPTION



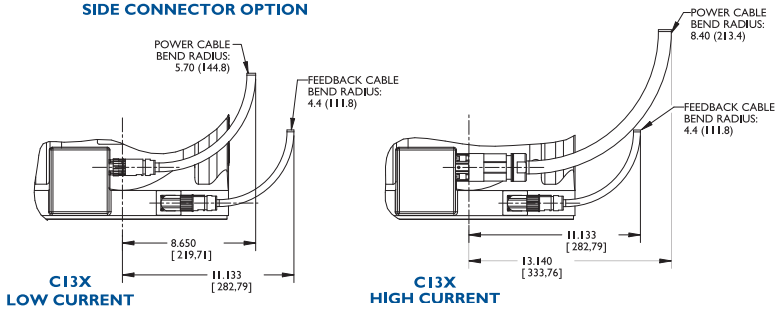
		C(H)131	C(H)132	C(H)133
Dim A	mm (inches)	231 (9.11)	301 (11.8)	370 (14.6)
Dim B	mm (inches)	191 (7.52)	260 (10.2)	329 (13.0)

For machine interface detail, see page 39

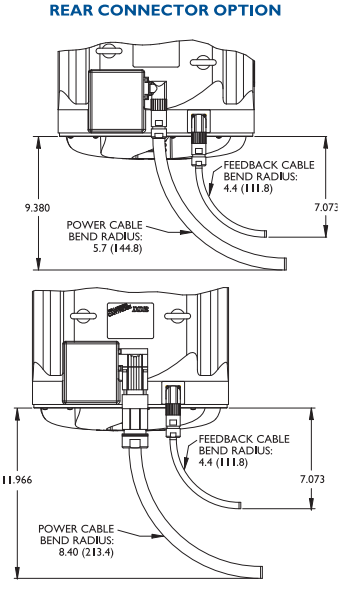
C(H)13x with Through Bore



SIDE CONNECTOR OPTION



REAR CONNECTOR OPTION



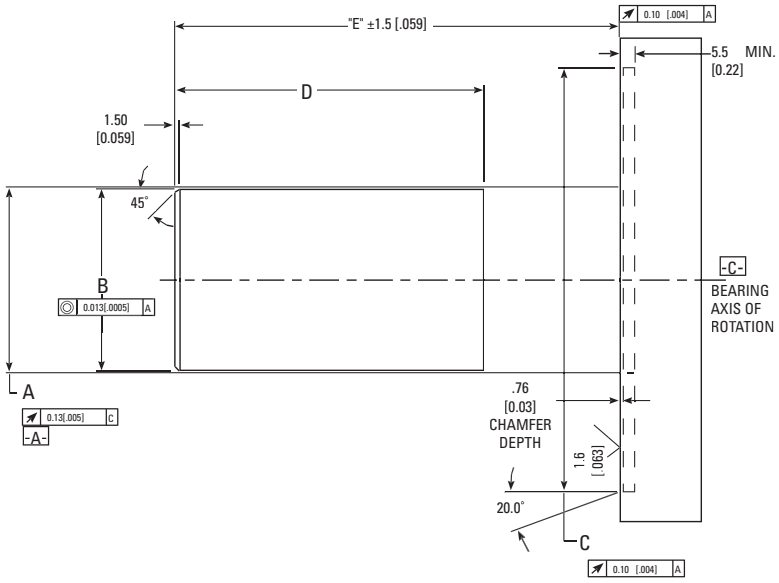
		C(H)131	C(H)132	C(H)133
Dim A	mm (inches)	231 (9.11)	301 (11.8)	370 (14.6)
Dim B	mm (inches)	191 (7.52)	260 (10.2)	329 (13.0)
Dim C	mm (inches)	182 (7.18)	251 (9.90)	320 (12.6)

For machine interface detail, see page 39

Mounting Requirements

Machine Mounting Requirements for C04x, C05x and C06x

This drawing details the machine interface configuration for mounting the C04, C05, and C06 Cartridge DDR motors. It is important to maintain specified tolerance, concentricity and run out to ensure proper operation and longevity of the Cartridge DDR motor.



Axial Shaft Movement

During operation, the shaft which the Cartridge DDR motor is mounted to shall not move axially more than +/- 0.13 mm (0.005 inch).

Shaft Material

The shaft material can be steel or stainless steel.

Machine Dimensions

Model	Dimensions				
	A Min. Max.	B Min. Max	C Min. Max	D Min. Max.	E Min. Max.
C(H)041	32.985 - 33.000 (1.2987 - 1.2992)	31.985 - 32.000 (1.2593 - 1.2598)	92.040 - 92.090 (3.6237 - 3.6255)	16.6 - 17.4 (0.655 - 0.685)	59.8 - 62.8 (2.351 - 2.469)
C(H)042	32.985 - 33.000 (1.2987 - 1.2992)	31.985 - 32.000 (1.2593 - 1.2598)	92.040 - 92.090 (3.6237 - 3.6255)	47.6 - 48.4 (1.875 - 1.905)	90.8 - 93.8 (3.571 - 3.689)
C(H)043	32.985 - 33.000 (1.2987 - 1.2992)	31.985 - 32.000 (1.2593 - 1.2598)	92.040 - 92.090 (3.6237 - 3.6255)	78.6 - 79.4 (3.095 - 3.125)	121.8 - 124.8 (4.791 - 4.909)
C(H)044	32.985 - 33.000 (1.2987 - 1.2992)	31.985 - 32.000 (1.2593 - 1.2598)	92.040 - 92.090 (3.6237 - 3.6255)	109.6 - 110.4 (4.315 - 4.345)	152.8 - 155.8 (6.011 - 6.129)
C(H)051	45.985 - 46.000 (1.8105 - 1.8110)	44.985 - 45.000 (1.7712 - 1.7717)	118.040 - 118.090 (4.6473 - 4.6492)	34.6 - 35.4 (1.365 - 1.395)	80.5 - 83.5 (3.171 - 3.289)
C(H)052	45.985 - 46.000 (1.8105 - 1.8110)	44.985 - 45.000 (1.7712 - 1.7717)	118.040 - 118.090 (4.6473 - 4.6492)	59.6 - 60.4 (2.345 - 2.375)	105.5 - 108.5 (4.151 - 4.269)
C(H)053	45.985 - 46.000 (1.8105 - 1.8110)	44.985 - 45.000 (1.7712 - 1.7717)	118.040 - 118.090 (4.6473 - 4.6492)	84.6 - 85.4 (3.335 - 3.365)	130.5 - 133.5 (5.141 - 5.259)
C(H)054	45.985 - 46.000 (1.8105 - 1.8110)	44.985 - 45.000 (1.7712 - 1.7717)	118.040 - 118.090 (4.6473 - 4.6492)	109.6 - 110.4 (4.315 - 4.345)	155.5 - 158.5 (6.121 - 6.239)
C(H)061	71.985 - 72.000 (2.8341 - 2.8346)	70.985 - 71.000 (2.7948 - 2.7953)	164.040 - 164.090 (6.4583 - 6.4602)	48.6 - 49.4 (1.915 - 1.945)	102.5 - 105.5 (4.031 - 4.149)
C(H)062	71.985 - 72.000 (2.8341 - 2.8346)	70.985 - 71.000 (2.7948 - 2.7953)	164.040 - 164.090 (6.4583 - 6.4602)	82.6 - 83.4 (3.255 - 3.285)	136.5 - 139.5 (5.371 - 5.489)
C(H)063	71.985 - 72.000 (2.8341 - 2.8346)	70.985 - 71.000 (2.7948 - 2.7953)	164.040 - 164.090 (6.4583 - 6.4602)	116.6 - 117.4 (4.595 - 4.625)	170.5 - 173.5 (6.711 - 6.829)

Dimensions are in millimeters (inches)

Machine Mounting Requirements for C09x and C13x

These drawings detail the machine interface configuration for mounting the Cartridge DDR motor. It is important to maintain specified tolerance, concentricity, and run out to ensure proper operation and longevity of the Cartridge DDR motor.

Axial Shaft Movement

Note there is a static and dynamic call out for axial length. The static tolerance is the allowable variance of the shaft before the motor is mounted. The dynamic tolerance is the allowable movement of the shaft after the motor is mounted and during operation.

Shaft Material

The shaft material must have a minimum yield strength of 55,000 PSI. This suggests the material shall be cold rolled steel with a minimum 0.30% carbon content.

Shaft Key

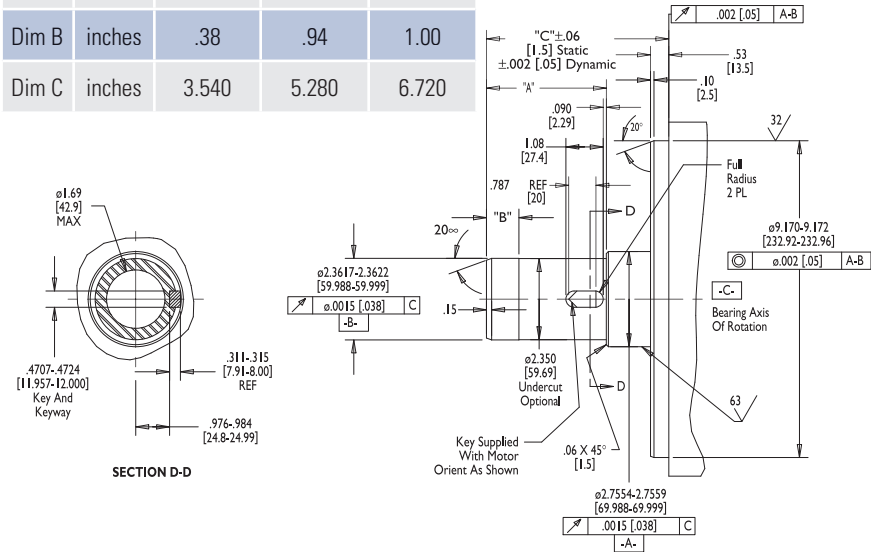
The C09x and C13x Cartridge DDR motors are provided with a key. If the materials and dimensions on this page and the compression coupling torque procedure are strictly followed, then the key is not needed. The key is provided as a safety precaution to avoid severe damage to the Cartridge DDR motor and to the machine it is mounted to that can result if the compression coupling is not properly engaged during operation. No key is used on the C04x, C05x and C06x.

Heat Dissipation

The Cartridge DDR motor is a source of heat connected directly to the machine frame. For applications which are sensitive to heat generation, the continuous torque rating of the Cartridge DDR must be reduced. To facilitate heat sensitive applications, Cartridge DDR motors have dual continuous torque ratings, 110°C rise for maximum capacity and 80°C rise for de-rated capacity.

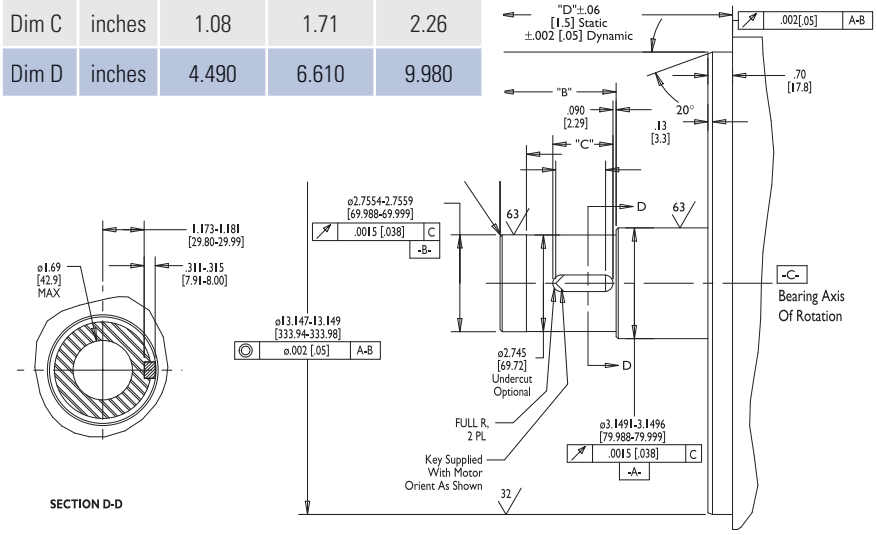
C(H)09x

		C(H)091	C(H)092	C(H)093
Dim A	inches	1.730	3.470	4.910
Dim B	inches	.38	.94	1.00
Dim C	inches	3.540	5.280	6.720



C(H)13x

		C(H)131	C(H)132	C(H)133
Dim A	inches	.37	.75	1.6
Dim B	inches	1.590	3.300	4.670
Dim C	inches	1.08	1.71	2.26
Dim D	inches	4.490	6.610	9.980



Model Nomenclature

Cartridge DDR Motor

C 09 1 A - 1 1 - 1 1 0 5 S - xxx

Product Family
C = 230 Volt
CH = 400/480 Volt

Frame Size Field
04 = 4.25" Sq. Housing
05 = 5.43" Sq. Housing
06 = 7.40" Sq. Housing
09 = 9.68" Sq. Housing
13 = 13.78" Sq. Housing

Stack Length Field
1 = Short Stack
2 = Mid Stack
3 = Long Stack
4 = Extra Long Stack
(04 and 05 frame sizes only)

Winding Letter Field
A = Standard Winding
B = High-Speed Winding (C04x, C05x, C06x, C13x)
C = Standard Winding (C052, C062, C063, C092, C093, C13x)
D = High-Speed Winding (C052 only)

Mounting Option Field
1 = Std. Flange Mount

Connector Option Field
1 = Side Connector Option (09 and 13 frame sizes only)
2 = Rear Connector Option (09 and 13 frame sizes only)
3 = 90° Rotatable Connectors (04, 05 and 06 frame sizes only)

Shaft Field
1 = Hollow with Compression Coupling and Key (09 and 13 frame sizes only)
2 = Solid with Compression Coupling and Key (09 and 13 frame sizes only)
3 = Solid with Split Ring Coupling and no Key (04, 05, and 06 frame sizes only)

Feedback Option Field
1 = Sine Encoder (C09 and C13)
3 = Sine Encoder (C04, C05 and C06)

Bearing Option Field
0 = No Bearing Design
(Standard - Integral Shipping Clamp Provided)

Unit Seal Option Field
5 = Sealed
(Shaft Option "1" - IP64 Rating when customer seals interface side)
(Shaft Option "2" or "3" - IP65 Rating when customer seals interface side)

Agency Certification Option Field
Blank = UL/CE Certification
S = Non-UL

Sequential number for specials
(Unique description within a frame size)

AKD Servo Drive

AKD – B 003 06 – NA AN 0000

AKD Series

Version
B = Base Drive
P = Position Indexer (motion tasking)

Current Rating
003 = 3 Amps
006 = 6 Amps
012 = 12 Amps
024 = 24 Amps

Voltage Option
06 = 120/240 Vac 1Ø/3Ø
07 = 480 Vac 3Ø

Extension
NA = Without extensions

Connectivity
AN = Analog Command
CN = CANopen
EC = EtherCAT

Variants
0000 = Standard

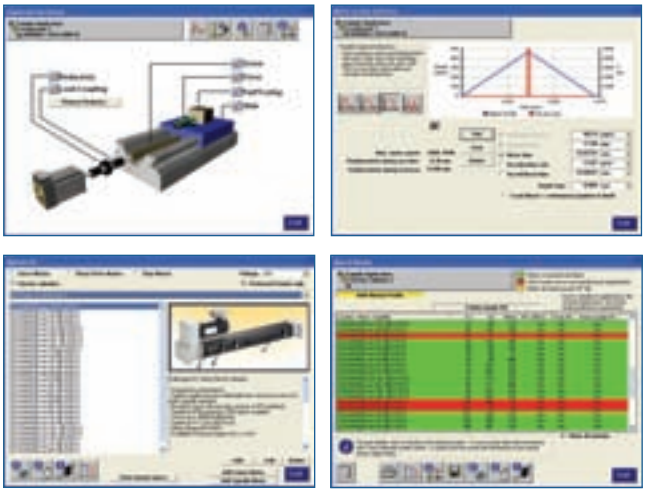
MOTIONEERING® Application Engine

To help select and size Kollmorgen components, this Windows®-based motor-sizing program takes a systems approach to the selection of brushless, DC servomotors, stepper motors and drives. MOTIONEERING® Application Engine, available at www.kollmorgen.com, uses a project concept for the collection and saving of rotary and linear multi-axis load information. This provides the user the flexibility to sum the effects of multiple axes of motion for power supply and shunt regeneration sizing.

A wide variety of linear and rotary mechanisms are provided including lead screw, rack and pinion, conveyor, nip rolls, cylinder, rotary, and direct data-entry using unique sizing algorithms and product databases criteria.

The searchable database consists of hundreds of systems on product combinations including rotary housed and frameless brushless servomotors, direct drive rotary and linear brushless servomotors, linear positioners (electric cylinders, rodless actuators, and precision tables) and stepper systems.

The Application Engine also provides versatile units-of-measure selection options for mechanism and motion profile data-entry, with the ability to convert data into other available units. Online Help explains program functions and the definition of terms and equations used in the program.



Features

- Group multiple mechanisms within a "Project" – organize and combine data for power supply and regeneration sizing
- Types of mechanisms for analysis include lead screw, rack and pinion, conveyor, nip rolls, rotary and direct drive linear motor
- Motion profile options include simple triangle, 1/3-1/3-1/3 trapezoidal, variable traverse trapezoidal, and more
- Search results display shows color highlighted solution set of options for easy evaluation of system specifications and selection

Supported Operating Systems

- Microsoft® Windows 2000, XP, Vista

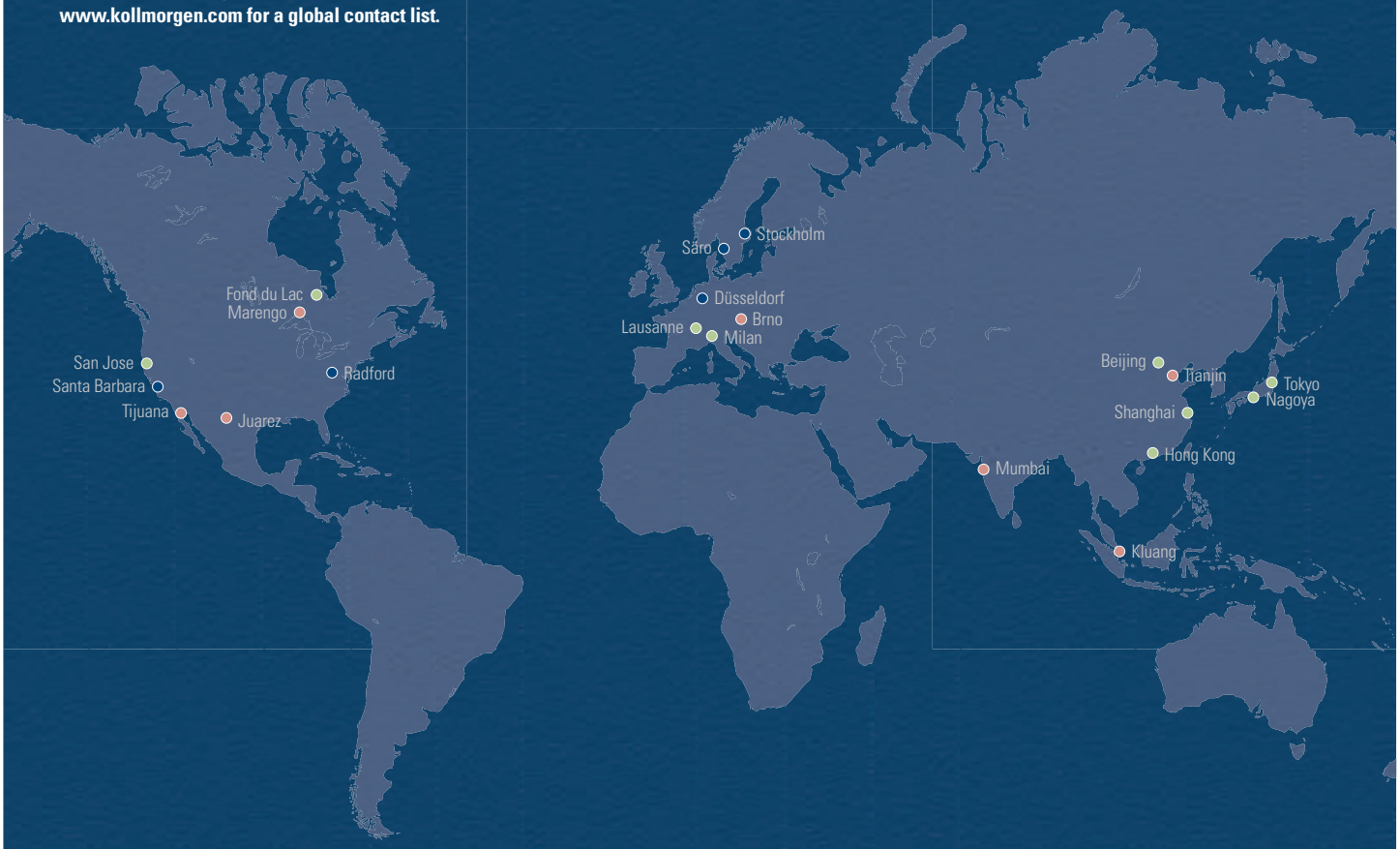
MOTIONEERING 6.0 includes

- Electric Cylinder sizing and selection with AKM Servomotor systems
- Rodless Actuator with AKM Servomotor systems (performance curves included)
- Precision Table with AKM Servomotor systems (performance curves included)
- PDF report functionality (includes application, drive, motor, positioner, and system specifications all in one easy-to-read report)

About Kollmorgen

Kollmorgen is a leading provider of motion systems and components for machine builders. Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions that are unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

For assistance with your application needs in North America, contact us at: 540-633-3545, contactus@kollmorgen.com or visit 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